

COST EFFECTIVENESS IN SEWER DESIGN

by

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## ABSTRACT

## COST EFFECTIVENESS IN SEWER DESIGN

GARY J. DIORIO, P.E.

MASTER OF SCIENCE

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Probably the most important challenge facing an engineer today is to ensure that his design is competitive in terms of costs. Besides being technically sound, the designer's objectives are to provide a cost effective solution.

This thesis presents a computer program to be used as a guide for the design of storm sewers to ensure a cost effective solution. The computer program is compiled to generate overland flows to inlets by use of a combination of the Rational Method and the Soil Conservation Method. The cost effective solution is found by applying the cost function according to the constraints set forth in the program. The program constraints involve minimum slopes to ensure proper velocities in the pipe, proper pipe sizes to ensure a technically sound design, and to provide a minimum depth of sewer throughout the entire length. A case study is also included and analyzed to provide reliability data for the computer program.

The design process, including cost computation, is laborious to the extent that it discourages the effort to explore all situations to arrive at a cost effective design. The purpose of this thesis is to provide the designer with the following:

1. A method of computation which results in realistic estimates of overland flow and pipe flow.
2. Combination of engineering and economic aspects simultaneously.
3. Capability of exploring all of the situations quickly to arrive at a cost effective design.

ACKNOWLEDGEMENT

I wish to take this opportunity to acknowledge and thank all of the people and institutions who have been instrumental in helping me to carry out and complete this thesis.

Special appreciation and thanks goes to my thesis advisor, Dr. Irfan A. Khan, who provided professional guidance, expertise, and the support I needed to accomplish this thesis.

I also extend my gratitude to my family and friends who supported me throughout my years of study. To Mrs. Nancy Long for her time and effort in typing this thesis along with advice from Mr. William Smiley and Mr. Thomas Powell on sewer design. Their time was greatly appreciated.

Most of all I wish to dedicate this work and express my unending gratitude and love to my wife, Anna Marie, and to my daughter, Jenna Marie, for their patience, sacrifices, understanding, support and love throughout my years of study.

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LIST OF SYMBOLS AND DEFINITIONSSYMBOLS

|        |                            |
|--------|----------------------------|
| ac.    | Acres                      |
| cf     | cubic feet                 |
| cfs    | cubic feet per second      |
| ENR    | Engineering News Record    |
| fps    | feet per second            |
| gpcd   | gallons per capita per day |
| gpd    | gallons per day            |
| in/hr. | inches per hour            |
| L      | length                     |
| LF     | lineal feet                |
| sf     | square foot                |
| lfd    | lineal foot of depth       |

DEFINITIONSBypass

An arrangement of pipes, conduits, gates, and/or valves whereby the flow may be routed around a hydraulic structure or appurtenance.

Combined Sewer

A sewer intended to serve as a sanitary sewer and storm drain, or as an industrial sewer and a storm drain.

Dry-Weather

Days of no precipitation or snowmelt which would cause an increase in flow at the WWTP.

Intercepting Sewer

A sewer that receives dry-weather flow from a number of sewers or outlets and frequently additional quantities of storm water (if from a combined system), and conducts such waters to a point for treatment or disposal.

### Lift Station

A small pumping station that lifts wastewater to a higher elevation when the continuance of the sewer at reasonable slopes would require excessive depths of trench, or that raises wastewater from areas too low to drain into available sewers.

### Rational Runoff Formula

A formula used to relate rainfall intensity to runoff. It is  $Q = CiA$  where  $Q$  is the peak discharge in cubic feet per second;  $C$  is the runoff coefficient, generally considered to be that part of the rainfall rate which will contribute to the runoff rate;  $i$  the average intensity of the rainfall in inches per hours during the time required for all parts of the watershed to contribute to runoff; and  $A$  is the area of the drainage basin in acres.

### Sanitary Sewer

A sewer intended to carry only sanitary and industrial wastewaters from residences, commercial buildings, industrial plants, and institutions.

### Separate System

A system of sewers and drains in which sanitary wastewater and storm water are carried in different conduits.

### Storm Sewer

A sewer intended to carry only storm waters, surface runoff, street wash waters, and drainage.

### Wet-Weather

Days when precipitation or snowmelt occur.



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## INTRODUCTION

The purpose of this thesis is to present a computer program to be used as a guide for the design of storm sewers to ensure a cost effective solution. This idea was presented in a Civil Engineering thesis titled A Computer Program for the Minimum Cost Design of a Sewer System, number 1348 as listed in Maag Library at Youngstown State University. A sewer design was presented using optimization technology in the form of dynamic programming. However, the results presented through a case study indicate a somewhat impractical use for this type of optimization. Invert elevations of the pipes designed by this method are approximately eighty feet deep representing an optimum solution. A design with inverts at such a large depth is impractical in accordance with today's engineering standards. The information presented here takes optimization techniques, alters them to include a series of constraints to ensure a technically sound design, and provides a cost effective solution.

Chapter I of this thesis describes cost effectiveness in sewer design. The purpose of the cost effective process is to determine the system that allows the user to most nearly achieve his stated goals and objectives. The objective is minimal cost, which is calculated subject to a series of constraints that may limit the selection of variable values. The initial analysis of a proposed storm sewer system is vital when undertaking a design. Initial consideration should be given to the topography of the area, the

types and depths of soils in the area, the points where flows originate and end, the quantity of flow that enters the system at different points, hydraulics of sewers, the cost and availability of sewer pipe and the cost of excavation and installation of sewer pipe. The constraints are centered around these variables.

The design process, including cost computations, is laborious to the extent that it discourages the effort to explore all situations to arrive at a cost effective design. The advantage of a computer based approach is that it allows the user to review numerous solutions quickly to arrive at the best decision.

In Chapter I, the user is taken through a step-by-step procedure to formulate the problem for the computer model. The problem is divided into stages which represent a pipe plus a downstream manhole. At each stage, a number of states or conditions are analyzed in accordance with the constraints to make a decision of minimal cost. At each state of the problem, the computer program would calculate the proper pipe size and slope. The constraints are introduced into the program to control the significant number of variables that are associated with sewer design as described above.

Cost equations are developed based on pipe size and depth of sewer. Historical data of actual construction cost bids were analyzed and linear cost equations were developed for a range of sewer depths. Equations were also developed if high groundwater or rock is encountered during design. The construction cost data analyzed was actual costs for labor and material for sewer construction basically within the state of

Ohio. If this program is used for designs outside of Ohio, then the user must adjust the cost equations to account for any changes in labor and material costs.

In Chapter II, the computer model formulation is discussed. The model computed a proper pipe size and slope at each stage that satisfied the constraints before moving on to the next stage. Input variables are explained in detail for the user for proper model operation. The computer model generates overland flow and pipe flow dependent on the size of rainfall and topographic features. The flows are stored in memory and are used to size and assign slopes to the system. The actual computer program is presented in Appendix A.

A case study presenting an actual design is included in Chapter III. It presents a step-by-step procedure from initial design technique through variable value determination for the computer model. The method presented can be applied to all types of storm sewer designed for any size rainfall. Information and tables contained in Appendices B and C are used in the computer run for the case study.

Chapter IV presents the results of the computer run with a reliability analysis of the case study. Hand calculations were made to verify the results of the case study. It was found that all constraints were met and that all pipe sizes and slopes calculated for each stage meet the pipe flow requirements. Conclusions for the case study are presented in Chapter V stating that this method of sewer design provides a reliable, technically sound design that is practical by today's engineering standards at a minimal cost.

CHAPTER ICOST EFFECTIVENESS IN SEWER DESIGN

Cost effectiveness is used in many complex decisions involving the selection of values for a number of interrelated variables. The purpose of the cost effective process is to determine the system that allows the decision-maker to most nearly achieve his stated goals and objectives. A decision is made with one objective in mind designed to measure the quality of that decision. In the case studied here, this one objective is cost, which is minimized subject to constraints that may limit the selection of variable values. Therefore, it is essential that the goals, objectives and constraints be clearly defined during problem formulation.

The complex and numerous decisions involved in the sewer design problem are discussed below. The goal of the designer is to achieve a sound sewer design. The objective is to develop a sound design at minimal cost. The decision made is to find the proper pipe size and slope subject to a number of constraints.

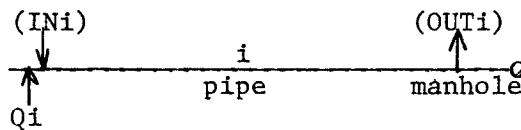
In order to facilitate the decision making process, the sewer design problem is divided into stages. The stages represent a pipe plus a downstream manhole. At each stage, a number of states or conditions are analyzed in accordance with the constraints to make a decision for minimal cost.

### THE STAGES

As stated previously, the stages represent a pipe plus a downstream manhole. It is assumed that a fictitious pipe of zero length with zero flow lies upstream of manhole A as shown in Figure 2 in Chapter III. The Case Study presented in Chapter III has 9 stages to consider.

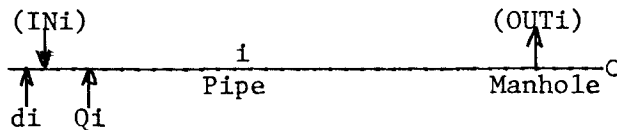
### THE STATES

The states at each stage represent the bottom invert elevation of the pipe. The input state is the bottom invert elevation of the upstream end of the pipe ( $IN_i$ ) and the end state is the bottom invert elevation of the downstream end of the pipe ( $OUT_i$ ).  $Q_i$  represents the flow input for the stage. Flow into the storm sewer would be to catch basins (inlets) at the input state ( $IN_i$ ). This is shown in the diagram below:



### THE DECISIONS

The decision to be made at each stage is how much drop can occur across the stage. This drop represents the slope of the pipe. The slope and flow rate then specify the pipe diameter. In the diagram below, the  $d_i$  represents the drop across the stage. It is assumed that the outflow bottom invert at a manhole must be the same elevation as the input bottom invert for the next stage downstream.

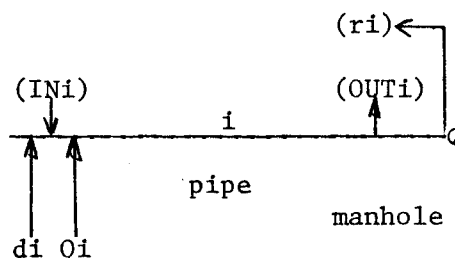


### COST FUNCTION

The cost equation for this program was formulated from historical data provided by Floyd Browne Associates, Limited, a consulting engineering firm from Marion, Ohio. This data is presented in Table No. 1. This cost data for the depth and pipe size given is an average of cost per lineal foot of pipe from actual construction bids over the last ten years. The costs are adjusted to a Engineering News Record Construction Cost Index of 4000.

The costs presented in Table No. 1 do not include dewatering (high water table conditions) costs or additional costs if rock is encountered. If soil conditions indicate that groundwater may be encountered in excavation, the costs in Table No. 1 must be increased \$10/L.F. for depths between 0 feet to 15 feet and \$15/L.F. for depths from 15 feet to 25 feet. For rock considerations, increase the costs in Table No. 1 by fifty percent.

The return ( $r_i$ ) is the minimal cost of the installation of the pipe at each stage as shown below:



Linear Regression of minimum cost versus diameter was performed on the data in Table No. 1 for each of the four ranges of pipe depths. The equations are those of a straight line with the cost calculated based on the pipe size needed. The equations are presented in Table No. 2.



TABLE NO. 1  
PIPE IN PLACE - ESTIMATED CONSTRUCTION COST  
COST/LIN. FT.

| Pipe Diameter<br>(in.)      (ft.) |        | <u>DEPTH IN FEET</u> |              |              |              |
|-----------------------------------|--------|----------------------|--------------|--------------|--------------|
|                                   |        | <u>0-10</u>          | <u>10-15</u> | <u>15-20</u> | <u>20-25</u> |
| 8                                 | (.67)  | 52                   | 60           | 68           | 72           |
| 10                                | (.83)  | 55                   | 63           | 72           | 76           |
| 12                                | (1.0)  | 60                   | 67           | 76           | 80           |
| 15                                | (1.25) | 70                   | 78           | 87           | 89           |
| 18                                | (1.50) | 78                   | 87           | 95           | 119          |
| 21                                | (1.75) | 81                   | 90           | 100          | 107          |
| 24                                | (2.0)  | 86                   | 95           | 111          | 134          |
| 27                                | (2.25) | 98                   | 108          | 124          | 168          |
| 30                                | (2.50) | 106                  | 116          | 132          | 177          |
| 36                                | (3.0)  | 131                  | 143          | 161          | 209          |
| 42                                | (3.50) | 147                  | 164          | 183          | 239          |
| 48                                | (4.0)  | 178                  | 189          | 200          | 240          |
| 54                                | (4.50) | 207                  | 219          | 237          | 280          |
| 60                                | (5.0)  | 220                  | 231          | 250          | 302          |
| 66                                | (5.5)  | 261                  | 273          | 289          | 356          |
| 72                                | (6.0)  | 300                  | 315          | 337          | 409          |
| 78                                | (6.5)  | 341                  | 354          | 378          | 449          |
| 84                                | (7.0)  | 400                  | 412          | 444          | 528          |

ENR = 4000

TABLE NO. 2  
COST FUNCTIONS

| <u>DEPTH</u><br>(ft.) | <u>EQUATION</u>        | <u>CORRELATION</u><br><u>COEFFICIENT</u> |
|-----------------------|------------------------|--|
| 0-10                  | $C = -5.85 + 50.66(D)$ | .98                                      |
| 10-15                 | $C = 13.96 + 50.41(D)$ | .98                                      |
| 15-20                 | $C = 8.55 + 54.30(D)$  | .98                                      |
| 20-25                 | $C = 777 + 66.28(D)$   | .99                                      |

C = Cost per lineal ft.

D = Diameter of pipe.

r = Correlation Coefficient (if equal to 1, all input data falls along a straight line).

## CONSTRAINTS

The initial analysis of a proposed storm sewer system is vital when undertaking a design. Analyzing a system consists of the following:

1. Topography of the region.
2. Types of soils.
3. Depths of soils.
4. The points where flows originate.
5. The location of a final outlet
6. The flows that enter the system at different points.
7. Hydraulics of flows in sewers.
8. Cost and availability of sewer pipe.
9. Cost of excavation and installation of sewer pipe.
10. Runoff Coefficients.

Considerable documentation is available for the reader to investigate involving the above tasks that will not be discussed in this thesis. These tasks are only mentioned here as a prelude to input data for the case study presented in Chapter III. The discussion that follows describes the constraints introduced in the computer model in Chapter II that eliminates many tedious computations by a designer.

A. Depth of Sewer. The constraint introduced into the computer model is that the minimum depth of sewer from ground surface to the pipe invert will be input by the designer. In the case study presented in Chapter III, this depth will be at least 5 feet. This depth is not an established standard but the designer must determine the proper depth of the proposed sewer based on existing site conditions.

Items such as existing utilities can aid in determining a depth of a proposed sewer. The cost functions previously discussed for the depth chosen for the design will have to be revised in the program.

B. Minimum Velocity. This constraint is introduced into the model to allow sufficient velocity to prevent settlement of solid matter so that no clogging or pooling of sediment occurs in the pipe. A minimum velocity of 2 feet per second at full depth of pipe is used. The minimum velocity of 2 fps is an established standard accepted by the Ohio Environmental Protection Agency. Maximum velocities are not used in this program but the reader must be aware that accepting high velocities in a design may pose a maintenance problem. High velocities erode pipes which may reduce the life span of the system and increase the operations and maintenance costs of the system. If high velocities are necessary, then the designer should consider using stronger pipe material to promote a longer life span for the system or in-line hydrobrakes or detention ponds.

C. Minimum Slope. The minimum slopes are used in this model to achieve the minimum velocities. At 2 fps the slopes for different pipe sizes are presented in Table No. 3.

D. Minimum Pipe Size. In this model, the downstream pipe cannot have a smaller diameter than the largest upstream pipe entering the manhole and the invert elevation of the pipe leaving a manhole (stage) must be greater than the invert elevation of the pipe entering the next downstream manhole (positive slope).

TABLE NO. 3  
MINIMUM SLOPES FOR DIFFERENT  
PIPE SIZES

| <u>Diameter</u><br>(inches (ft)) | <u>Slope</u><br>(FT/FT) |
|----------------------------------|-------------------------|
| 8 (.67)                          | .0034                   |
| 10 (.83)                         | .0024                   |
| 12 (1.0)                         | .0020                   |
| 14 (1.25)                        | .0015                   |
| 18 (1.50)                        | .0012                   |
| 21 (1.75)                        | .0010                   |
| 24 (2.0)                         | .0008                   |
| 27 (2.25)                        | .0007                   |
| 30 (2.50)                        | .0006                   |
| 36 (3.0)                         | .0006                   |
| 42 (3.50)                        | .0005                   |
| 48 (4.0)                         | .0004                   |
| 54 (4.50)                        | .0004                   |
| 60 (5.0)                         | .0004                   |
| 66 (5.5)                         | .0003                   |
| 72 (6.0)                         | .0003                   |
| 78 (6.5)                         | .0003                   |
| 84 (7.0)                         | .0002                   |

E. Design Equation. The design equation used in this model is the Manning's Equation for pipes flowing full:

$$V = \frac{0.590}{n} D^{2/3} S^{1/2}$$

Equation number 21-33b  
obtained from reference  
3 in Bibliography.

where:

V = Pipe velocity in fps.

n = Roughness Coefficient for pipe material used. This n-factor is determined by pipe manufacturers and is dependent on the smoothness of the pipe material used.

D = Pipe diameter in feet.

S = pipe slope in feet/feet.

COST EFFECTIVE EQUATIONS

The cost effective equations for this computer model are as follows:

OBJECTIVE EQUATION:  $C = -5.85 + 50.66 (D)$

SUBJECT TO:  $INELEV (I) \geq COVMIN = \text{Minimum cover from ground surface to pipe invert.}$

$V(I) \geq 2 \text{ FPS}$

$SLO(I) \geq \text{Minimum slope at 2 FPS (See Table 3)}$

$D \geq \text{Pipe diameter of previous stage.}$

Where:  $C = \text{Pipe cost in dollars}$

$D = \text{Pipe diameter in feet}$

$INELEV (I) = \text{Invert elevation of pipe at stage I}$

$V(I) = \text{Pipe velocity at stage I}$

$SLO(I) = \text{Pipe slope at stage I.}$

CHAPTER II

COMPUTER MODEL FORMULATION

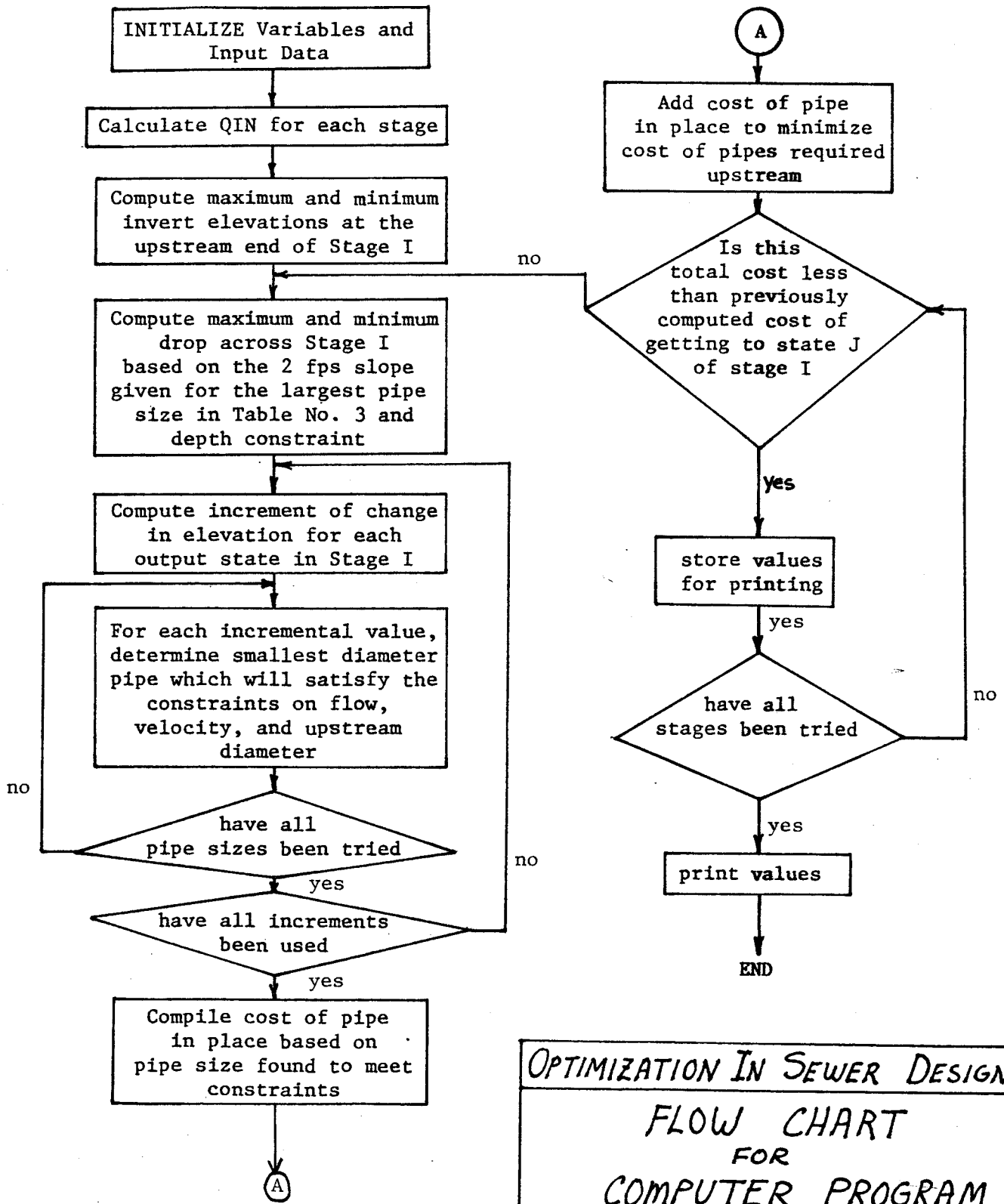
THE COMPUTER PROGRAM

As stated previously, the user must perform certain preliminary tasks when initiating a design of this type. On a map, the designer must define the boundaries of each subarea. A subarea is an area consisting of homogeneous land cover that is tributary to the sewer at the point at which the pipe size and slope is to be determined (a stage). Also, on a map, the designer should draw lines and arrows to represent flow direction. Manholes should then be located tentatively and distances measured between them, usually 300 to 400 feet apart.

The computer program was written in TI Basic for operation using a Texas Instruments TI 99/4A personal computer. A flow chart for the program is presented in Figure 1. The actual program is presented in Appendix A of this thesis.

Input variables are presented below:

| <u>VARIABLE</u>     | <u>DESCRIPTION</u>  |
|---------------------|---|
| AN                  | Manning's Roughness Coefficient   |
| VMIN                | Minimum Allowable Velocity in Pipe (fps)  |
| COVMIN              | Minimum distance between bottom invert of pipe and ground elevation at manhole in feet. |
| OELEV               | Bottom invert elevation of final outlet in feet above datum                             |
| NPDIA               | Number of possible pipe sizes in input data.  |
| NPIPE               | Number of stages, where a stage is a pipe and a downstream manhole                      |
| ACRE(I), I=1,NPIPE  | Acres of subarea at Ith stage.  |
| RCOF (I), I=1,NPIPE | Rational Method Runoff Coefficient  |
| LMCS(I), I=1,NPIPE  | Length of main overland flow channel in subarea in ft.                                  |
| EMRP(I), I=1,NPIPE  | Elevation of most remote point in subarea in feet above datum.                          |
| GELEV(I), I=1,NPIPE | Ground surface elevation at beginning of Ith stage.                                     |



OPTIMIZATION IN SEWER DESIGN  
 FLOW CHART  
 FOR  
 COMPUTER PROGRAM  
 CIVIL ENGR. GRADUATE THESIS  
 DATE: AUGUST, 1986 DRAWN BY: G. DIORIO FIGURE 1



|                      |   |
|----------------------|---|
| PDIA(I), I=1, NPDIA  | Diameter of Ith possible pipe size in input data in feet.   |
| S2FPS(I), I=1, NPDIA | Minimum slope to meet velocity requirements in ft./ft.  |
| PLONG(I), I=1, NPIPE | Length of Ith pipe in ft.   |
| FREQ                 | Return Frequency of Storm   |
| K                    | "K" value in Steel Formula, See Appendix B.   |
| B                    | "B" value in Steel Formula, See Appendix B.   |
| INCR                 | Incremental value between the maximum and minimum invert elevations used to calculate the proper pipe size and slope. |

Flow from each subarea to an inlet (manhole) is found through a combination of the Rational Method and the Soil Conservation Method. The Rational Method theory can be found in reference 1 and the Soil Conservation Service Method theory can be found in reference 7. Combining the two equations:

$$\text{Lag} = 0.6 \text{ to } \text{where } \text{to} = \text{time of concentration}$$

with

$$\text{Lag} = \frac{L^{0.8} (S+1)^{0.7}}{(1900) SL^{0.5}} \quad \text{where}$$

Lag = the time between a brief heavy rain and the maximum runoff rate,

L = length of main overland flow channel in subarea in feet,

S = (1000/CN)-10 with CN = SCS curve number, see Appendix B, and

SL = slope of subarea, in percent,

gives a value for the time of concentration  $t_o$  (overland flow time) for each subarea. The Steel Formula:

$$I = \frac{K}{\underline{t_o+B}}$$

is used to calculate the rainfall intensity (See Appendix B) for values of K and B. Intensity-Frequency-Duration curves are not available for the area used in the Case Study discussed in the next Chapter. The Rational Formula:  $Q = CIA$

where      Q = flow to a stage  
               C = Runoff coefficient (See Appendix B)  
               I = Rainfall intensity in inches/hour  
               A = Acres of subarea

is then used to calculate the flow to each stage of the program. This program is set up for small drainage areas (less than 5 acres), therefore, results using the Rational Method will be realistic.

The program then calculates the maximum and minimum invert elevations for each stage based on the constraints. The program then calculates the maximum and minimum invert elevations for each stage based on the constraints. The maximum invert elevation is calculated by subtracting the minimum cover depth input to the program from the ground elevation at that stage. To find the minimum invert elevation, the program uses the minimum slope for the largest pipe size input to the program for the desired minimum velocity. This slope is used to calculate the maximum drop across a stage by multiplying it by the proposed length of pipe across the stage. This result is the maximum drop in the pipe for that stage. The minimum invert elevation is then calculated by taking the invert elevation at the end of the previous stage and

subtracting the calculated maximum drop. If the topography causes the minimum invert elevation to be greater than the maximum invert elevation, then the minimum invert elevation is then assumed by the program as 10 feet below the maximum. This method allows a sufficient distance between the maximum and minimum invert elevations for the program to calculate a slope and pipe size to meet the constraints. At each incremental value, if the program cannot find a pipe size or slope to meet the constraints, then the calculations are resumed at the next incremental value which would allow steeper slopes and more capacity to carry the pipe flow. Calculations are made for velocity, slope, and pipe capacity at each incremental value input to the program. If all constraints are met, then the cost of construction is then calculated and stored in memory.

As shown earlier, the cost equations are based on pipe size and depth. Specifically, the deeper the pipe, the greater the cost. This important item of optimization is built into the program itself. The program starts at the shallowest incremental invert elevation and works deeper until all constraints are met. Therefore, the first pipe size and slope to meet the constraints that is found by the program would be the least cost alternative. This "built-in" feature also cuts down on over-design.

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$$I = \frac{K}{\underline{to+B}}$$

is used to calculate the rainfall intensity (See Appendix B) for values of K and B. Intensity-Frequency-Duration curves are not available for the area used in the Case Study discussed in the next Chapter. The

Rational Formula:  $Q = CIA$

where      Q = flow to a stage  
               C = Runoff coefficient (See Appendix B)  
               I = Rainfall intensity in inches/hour  
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is then used to calculate the flow to each stage of the program. This program is set up for small drainage areas (less than 5 acres), therefore, results using the Rational Method will be realistic.

The program then calculates the maximum and minimum invert elevations for each stage based on the constraints. The program then calculates the maximum and minimum invert elevations for each stage based on the constraints. The maximum invert elevation is calculated by subtracting the minimum cover depth input to the program from the ground elevation at that stage. To find the minimum invert elevation, the program uses the minimum slope for the largest pipe size input to the program for the desired minimum velocity. This slope is used to calculate the maximum drop across a stage by multiplying it by the proposed length of pipe across the stage. This result is the maximum drop in the pipe for that stage. The minimum invert elevation is then calculated by taking the invert elevation at the end of the previous stage and

subtracting the calculated maximum drop. If the topography causes the minimum invert elevation to be greater than the maximum invert elevation, then the minimum invert elevation is then assumed by the program as 10 feet below the maximum. This method allows a sufficient distance between the maximum and minimum invert elevations for the program to calculate a slope and pipe size to meet the constraints. At each incremental value, if the program cannot find a pipe size or slope to meet the constraints, then the calculations are resumed at the next incremental value which would allow steeper slopes and more capacity to carry the pipe flow. Calculations are made for velocity, slope, and pipe capacity at each incremental value input to the program. If all constraints are met, then the cost of construction is then calculated and stored in memory.

As shown earlier, the cost equations are based on pipe size and depth. Specifically, the deeper the pipe, the greater the cost. This important item of optimization is built into the program itself. The program starts at the shallowest incremental invert elevation and works deeper until all constraints are met. Therefore, the first pipe size and slope to meet the constraints that is found by the program would be the least cost alternative. This "built-in" feature also cuts down on over-design.

CHAPTER III  
COMPUTER MODEL FORMULATION  
CASE STUDY

This chapter presents a case study of an actual storm sewer design. The area chosen is shown on Figure 2. It is a residential area of homogeneous land use in Mahoning County, Ohio. Figure 2 shows the tentative location of the manholes and piping. Each sub-area is also delineated on the map along with arrows representing overland flow direction. It is assumed that this area is newly developed and that the sewer is constructed before the roadway.

This study is broken down into 9 stages. A stage represents a pipe plus a downstream manhole with a fictitious pipe of zero length upstream of manhole A. The topography of the area is gradually sloping as can be seen by the contour locations. Outfall of this storm sewer is to a receiving stream as shown.

The type of pipe used in this study is polyvinylchloride (PVC) pipe. Manning's  $n$  for this pipe is .009. The minimum velocity is 2 feet per second. The minimum cover, which is the distance from the ground surface to the pipe invert, is 5 feet. The outfall ground elevation is 1015 feet. The number of possible pipe diameters is 18, ranging from 8 inches (.67feet) to 84 inches (7 feet). See Table 3. The design of this sewer is for a 4year storm. The "K" value of the Steel Formula is 131 and the "B" value is 19, taken from Table B-1 in Appendix B.

The soil type in this area is called "Mahoning". Using the Table provided in Appendix C, the hydrologic soil group for "Mahoning" soils is D. Then using Table B-3 in Appendix B, the SCS curve number for residential land use of 1/2 acre in size and 25 percent impervious is 85. The number of increments used between the maximum invert elevation and the minimum invert elevation is 20. The Runoff Coefficient for the Rational Method is 0.4 for each stage taken from Table B-2 in Appendix B.

Additional input data is contained in Table 4.

1030

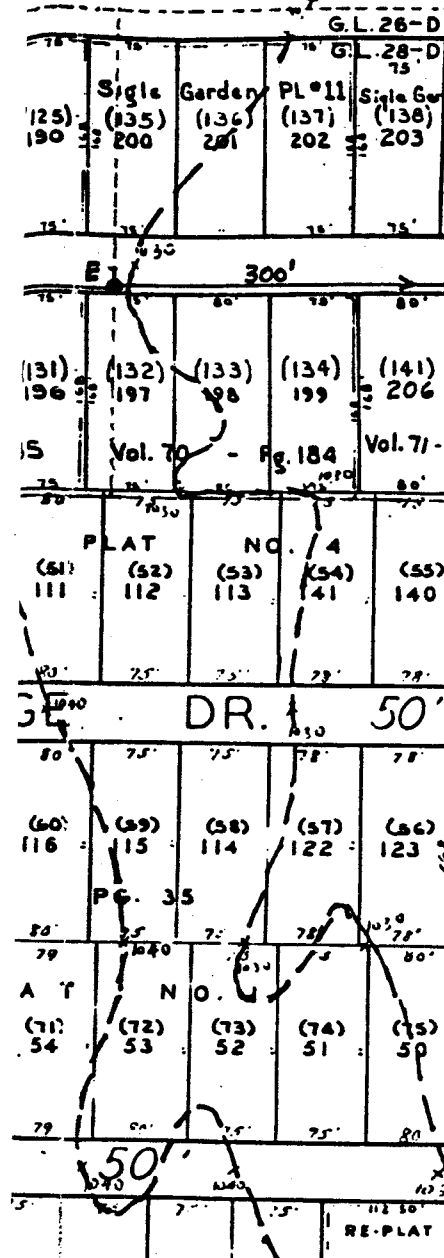






TABLE 4

INPUT DATA-CASE STUDY

| <u>Stage</u> | <u>Subarea<br/>Acres</u> | <u>Runoff<br/>Coefficient</u> | <u>Length of<br/>Main Overland<br/>Flow Channel (pt)</u> | <u>Elevation of<br/>most remote<br/>Point in Subarea<br/>(FT)</u> | <u>Ground<br/>Elevation<br/>(FT)</u> | <u>Pipe<br/>Length<br/>(FT)</u> | <u>Manhole</u> |
|--------------|--------------------------|-------------------------------|--|---|--------------------------------------|---------------------------------|----------------|
| 1            | 1.20                     | 0.4                           | 185  | 1077  | 1069                                 | 0                               | A              |
| 2            | 1.10                     | 0.4                           | 125  | 1071  | 1062                                 | 250                             | B              |
| 3            | 1.43                     | 0.4                           | 175  | 1060  | 1049                                 | 300                             | C              |
| 4            | 1.30                     | 0.4                           | 180  | 1055  | 1040                                 | 300                             | D              |
| 5            | 1.35                     | 0.4                           | 185  | 1040  | 1030                                 | 300                             | E              |
| 6            | 1.39                     | 0.4                           | 185  | 1035  | 1025                                 | 300                             | F              |
| 7            | 1.44                     | 0.4                           | 185  | 1027  | 1020                                 | 300                             | G              |
| 8            | 1.17                     | 0.4                           | 185  | 1020  | 1017                                 | 250                             | H              |
| 9            | 1.0                      | 0.4                           | 150  | 1017  | 1015                                 | 360                             | O              |

CHAPTER IV  
COMPUTER MODEL FORMULATION  
RESULTS

The results of the computer run discussed in the previous chapter are shown on Table No. 5. Figure 3 is the design profile for this storm sewer. As can be seen, all constraints are met. The pipe depth from the ground to the invert is at least 5 feet. The pipe diameter downstream of the previous stage is at least the same size or greater and sized according to flow requirements.

PROGRAM RELIABILITY

Hand calculations were made to verify the results of the Case Study computer run using a National Clay Pipe Institute (NCPI) Gravity Flow Hydraulic Calculator. This calculator is a homograph type of which a photo copy is contained in Appendix B. This calculator contains several scales to relate the various parameters used with the Manning's Formula for solution to sewer design problems. Using the known invert elevations found by the program, since the constraint for pipe depth is correct along with the pipe flow found using the Rational Method, a check was made verifying the pipe size and diameter for each stage. It was found that all pipe sizes and slopes calculated for each stage meet the pipe flow requirements. The results of the check are shown below:

|                     |   |      |      |      |      |      |      |      |       |
|---------------------|---|------|------|------|------|------|------|------|-------|
| STAGE               | 1 | 2    | 3    | 4    | 5    | 6    | 7    | 8    | 9     |
| PIPE DIAMETER (FT.) | 0 | .67  | 1.0  | 1.25 | 1.5  | 2.0  | 2.25 | 2.5  | 3.0   |
| SLOPE (FT/FT)       | 0 | .030 | .043 | .029 | .035 | .016 | .016 | .014 | .0053 |

A check was also made with the NCPI calculator on the constraint for minimum velocity. All stages of the case study design meet this requirement.

TABLE NO.5

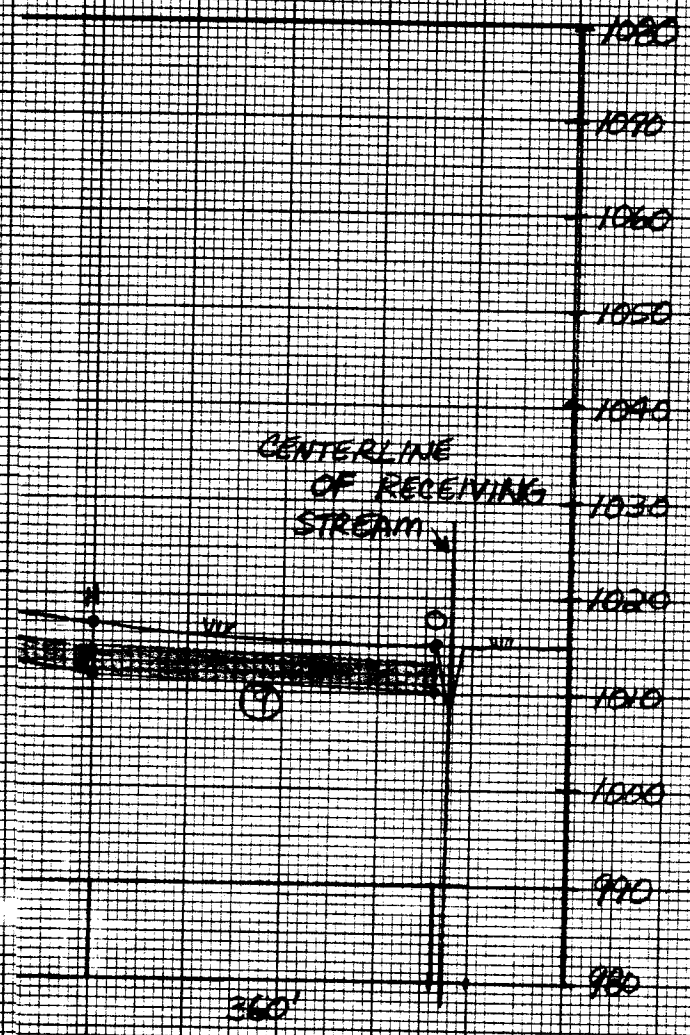
CASE STUDY RESULTS

|                       | <u>1</u> | <u>2</u> | <u>3</u> | <u>4</u> | <u>5</u> | <u>6</u> | <u>7</u> | <u>8</u> | <u>9</u> |
|-----------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| PIPE LENGTH           | 0        | 250      | 300      | 300      | 300      | 300      | 300      | 250      | 360      |
| PIPE FLOW (cfs)       | 0        | 2.74     | 7.58     | 14.72    | 23.55    | 33.8     | 45.57    | 58.5     | 72.26    |
| PIPE DIAMETER (ft)    | 0        | .67      | 1.0      | 1.25     | 1.50     | 2.0      | 2.25     | 2.50     | 3.0      |
| SLOPE (ft/ft)         | 0        | .030     | .045     | .030     | .035     | .018     | .017     | .014     | .007     |
| INVERT ELEVATION (ft) | 1064     | 1056.4   | 1043.5   | 1034.94  | 1024.5   | 1019.74  | 1014.98  | 1011.5   | 1009.6   |
| GROUND ELEVATION (ft) | 1069     | 1062     | 1049     | 1040     | 1030     | 1025     | 1020     | 1017     | 1015     |
| PIPE DEPTH (ft)       | 5        | 5.5      | 5.5      | 5.06     | 5.5      | 5.26     | 5.02     | 5.5      | 5.4      |

TOTAL CONSTRUCTION COST = \$202,385.55.

K•E 10 X 10 TO 1/4 INCH • 10 X 15 INCHES  
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47 1323



OPTIMIZATION IN SEWER DESIGN

CASE STUDY  
DESIGN PROFILE

CIVIL ENGR. GRADUATE THESIS

DATE: AUGUST, 1964 DRAWN BY: G. DIORIO FIGURE 3

The construction cost calculated by the program is \$202,385,55. An itemized breakdown is shown in Table No. 6 with unit costs and calculated quantities to check the cost equations. The unit costs are an average of actual contractors' bid prices for a sewer installation project received in January, 1986. As can be seen, the calculation of construction cost by the program is reliable for the type of case study presented here.

TABLE NO. 6  
CONSTRUCTION COST BY  
QUANTITY AND UNIT PRICE

| ITEM                    | DESCRIPTION                | QUANTITY | UNIT PRICE | COST       |
|-------------------------|----------------------------|----------|------------|------------|
| 1                       | Earth Excavation           | 2,100 CY | \$12 CY    | \$25,200   |
| 2                       | Granular Backfill          | 1,050 CY | \$30 CY    | 31,500     |
| 3                       | 9" Aggregate Base Course   | 1,050 CY | 5 CY       | 5,250      |
| 4                       | 2½" Asphalt Concrete       | 1,050 SY | 30 SY      | 31,500     |
| *5                      | 8" PVC Gravity Pipe Sewer  | 250 LF   | 18/LF      | 4,500      |
| *6                      | 12" PVC Gravity Pipe Sewer | 300 LF   | 26/LF      | 7,800      |
| *7                      | 15" PVC Gravity Pipe Sewer | 300 LF   | 32/LF      | 9,600      |
| *8                      | 18" PVC Gravity Pipe Sewer | 300 LF   | 38/LF      | 11,400     |
| *9                      | 24" PVC Gravity Pipe Sewer | 300 LF   | 46/LF      | 13,800     |
| *10                     | 27" PVC Gravity Pipe Sewer | 300 LF   | 52/LF      | 15,600     |
| *11                     | 30" PVC Gravity Pipe Sewer | 250 LF   | 58/LF      | 14,500     |
| *12                     | 36" PVC Gravity Pipe Sewer | 360 LF   | 66/LF      | 23,760     |
| *13                     | 4' Diameter manholes       | 48 LFD   | 120/LFD    | 5,760      |
| TOTAL CONSTRUCTION COST |                            |          |            | \$ 200,170 |

\* Costs include items such as installation, pipe bedding, and pipe testing.

## CHAPTER V

### SUMMARY AND CONCLUSIONS

#### SUMMARY

The purpose of this thesis is to provide the sewer designer with the following:

1. A method of computation which results in realistic estimates of overland flow and pipe flow.
2. A combination of engineering and economic aspects simultaneously.
3. Capability of exploring all of the situations quickly to arrive at a cost effective solution.

A computer program was developed to be used as a guide for the design of storm sewers to ensure a cost effective solution. The cost effective solution is found by applying the cost function according to the constraints set forth in the program.

An actual case study of storm sewer design is included to check the reliability of the design computer program.

#### CONCLUSIONS

Based on the information and data presented here, the following conclusions can be made.

1. The method presented in the computer model combines engineering and economic aspects simultaneously, that results in a sound sewer design at minimal costs.
2. The computer program should be used on relatively small drainage areas (subareas of less than 5 acres) to maintain realistic overland flows and pipe flows.

3. The computer program is flexible enough to be easily modified to conform with any type of topographic and geologic situation.
  - a. Modify cost equations depending on depth of pipe desired and geologic considerations, such as rock or high groundwater.
  - b. Modify minimum depth of pipe and pipe roughness coefficient to "fit" the design to the topographic and geologic restrictions. The case study used here is a discharge to an open stream. Input data can be adjusted for the case of discharging to another storm sewer, for example.
4. The program is simple in structure and can be easily modified for use on any other type of personal computer.
5. The results of the Case Study indicate that the computer program can provide a reliable design based on the constraints set forth.



APPENDIX A

Computer program

COST EFFECTIVENESS IN SEWER DESIGN

```
10 INPUT "MANNINGS N _": AN
20 INPUT "MIN VELOCITY IN PIPE (FPS)_": VMAX
30 INPUT "MIN COVER (FROM GROUND TO INVERT)_": COVMIN
40 INPUT "INVERT ELEVATION OF OUTLET_": OELEV
50 INPUT "NUMBER OF POSSIBLE PIPE SIZES_": NPDIA
60 INPUT "NUMBER OF STAGES_": NPIPE
65 INPUT "INCREMENTAL VALUE FOR DESIGN_": INCR
70 DIM ACRE(10), RCOF(10), LMCS(10), EMRP(10), GELEV(10), PLONG(10)
80 FOR I=1 TO NPIPE
90 INPUT "ACRES OF SUBAREA AT Ith STAGES_": ACRE(I)
100 INPUT "RUNOFF COEFFICIENT(C) FOR Ith STAGE_": RCOF(I)
110 INPUT "LENGTH OF MAIN CHANNEL IN SUBAREA_": LMCS(I)
120 INPUT "ELEVATION OF MOST REMOTE PT. IN SUBAREA_": EMRP(I)
130 INPUT "GROUND SURFACE ELEVATION AT Ith STAGE_": GELEV(I)
135 INPUT "LENGTH OF ITH PIPE_": PLONG(I)
140 NEXT I
150 DIM PDIA(10), S2FPS(10)
160 FOR I=1 TO NPDIA
170 INPUT :DIAMETER OF Ith POSSIBLE PIPE SIZE(FEET)_": PDIA(I)
180 INPUT :MINIMUM SLOPE TO MEET VELOCITY REQUIREMENTS_": S2FPS(I)
190 NEXT I
200 INPUT "RETURN FREQUENCY OF STORM_": FREQ
210 INPUT "K-VALUE IN STEEL FORMULA_": A
220 INPUT "B-VALUE IN STEEL FORMULA_": B
230 INPUT "SCS CURVE NUMBER FOR THE SUBAREAS_": CN
```

```
240 DIM OFT(10), SL(10)
250 S=(1000/CN)-10
260 FOR I = 1 to NPIPE
270 SL(I)=((EMRP(I)-GELEV(I))/LMCS(I)*100
280 OFT(I)=((LMCS(I)^.8)*((S+1)^.7))/(.6*1900*(SL(I)^.5))
290 OFT(I)=OFT(I)*60
300 NEXT I
310 DIM PFT (10)
320 FOR I=1 TO NPIPE
330 PFT (I)=PLONG(I)/VMAX*60)
340 NEXT I
350 DIM TCON (10), IN(10), SCA(10), QIN(10), TC(10)
360 TCON(1)=OFT(1)
370 IN(1)=A/(TCON(1)+B)
380 SCA(1)=ACRE(1)*RCOF(1)
390 QIN(1)=SCA(1)*IN(1)
400 FOR I = 2 TO NPIPE
410 TC(I)=TCON(I-1)+PFT(I)
420 IF TC(I)>OFT(I) THEN 425
421 TCON (I)=OFT(I)
422 GO TO 426
425 TCON (I)=TC(I)
426 IN(I)=A/(TCON(I)+B)
430 SCA(I)=SCA(I-1)+(ACRE(I)*RCOF(I))
440 QIN(I)=SCA(I)*IN(I)
450 NEXT I
```

```
460 DIM PFLOW(10), DIAT(10), ELMAX(10), ELMIN(10), INELEV(10),  
    MOROP(10), ELH(10), SLOP(10), DROP(10), SLO(10), VEL(10)  
461 DIM Q(10), VEL(10), QU(10)  
470 PFLOW(10)=0.0  
480 DIAT(1)=0  
490 TCOST=0.0  
500 FOR I=2 TO NPIPE  
510 PFLOW(I)=PFLOW(I-1)+QIN(I-1)  
520 NEXT I  
530 ELMAX(1)=GELEV(1)-COVMIN  
540 ELMIN(1)=ELMAX(1)  
550 INELEV(1)=ELMAX(1)  
560 SLOMIN=S2FPS(NPDIA)  
570 FOR I=2 TO NPIPE  
580 MDROP(I)=SLOMIN*PLONG(I)  
590 ELMIN(I)=INELEV (I-1)-MDROP(I)  
600 ELMAX (I)=GELEV(I)-COVMIN  
610 IF ELMIN(I) ELMAX(I) THEN 630  
620 GO TO 640  
630 ELMIN(I)=ELMAX(I)-10  
640 DELH(I,J)=(ELMAX(I)-ELMIN(I))/INCR  
650 FOR J=1 TO INCR  
660 DELH(I,J)=DELH(I,J)*J  
670 FOR M=1 TO NPDIA  
680 DROP(m)=ELMAX(I)-DELH(I,J)  
690 SLO(m)=(ELMAX(I)-DROP(m))/PLONG(I)  
700 VEL(m)=(0.59*(PDIA(m)1.667*(SLO(m)1.5))/AN
```

```
710 Q(M)=3.1416*PDIA(M)*PDIA(M)*.25*VEL(M)
720 IF Q(M)<PFLOW(I) THEN 790
730 IF VEL(M)<VMAX.THEN 790
740 IF SLO(M)<S2FPS(m) THEN 790
750 IF PDIA(M)<DIAT(I-1) THEN 790
760 DIAT(m)=PDIA(M)
770 SLOPT(I)=SLO (M)
780 GO to 830
790 NEXT M
800 NEXT J
810 PRINT "FOR STAGE_":(I);"NO PIPE SIZE TO MEET CONSTRAINTS CAN
      BE FOUND_"
820 GO to 870
830 ELH(I)=ELMAX(I)-DELH(I,J)
840 INELEV(I)=ELH(I)
850 COST= (-5.85+(50.66* DIAT(I)))*PLONG(I)
860 TCOST=TCOST+COST
870 NEXT I
1480 FOR I=1 TO NPIPE
1490 PRINT "FOR STAGE_":(I)
1500 PRINT "THE LENGTH OF PIPE IN STAGE_";(I);"IS";PLONG(I)
1510 PRINT "THE PIPE FLOW IS _"; PFLOW(I)
1520 PRINT "THE QUANTITY OF FLOW ENTERING THE SYSTEM IS-";QIN(I)
1530 PRINT "THE DIAMETER OF THE PIPE IS _"; DIAT(I)
1540 PRINT "THE ELEVATION OF THE INVERT IS_"; ELEIV(I)
```

```
1550 PRINT "THE GROUND ELEVATION IS _"; GELEV(I)
1552 BREAK 1560
1560 NEXT I
1570 PRINT "THE TOTAL COST FOR THE SYSTEM IS _"; TCOST
1580 END
```

APPENDIX B

Standard Tables Used to Formulate Input Data  
to the Computer Program

APPENDIX BStandard Tables Used to Formulate Input Data  
to the Computer Program

This Appendix contains certain standard tables that are to be used to formulate input data to the computer program. The tables are:

|                |  |
|----------------|--|
| Table No. B-1  | Coefficients for the Steel Formula<br>(Taken from the Standard Handbook for<br>Civil Engineers, McGraw-Hill, Second<br>Edition, 1976).                                       |
| Table No. B-2  | Recommended Runoff Coefficients (Taken<br>from Modern Sewer Design, American Iron<br>and Steel Institute, First Edition, 1980)   |
| Table No. B-3  | Runoff Curve Numbers for selected Land<br>Use. (Taken from Technical Release No.<br>55, "Urban Hydrology for Small Watershed",<br>Soil Conservation Services, January, 1975. |
| Figure No. B-1 | National Clay Pipe Institute Gravity<br>Flow Hydraulics Calculator.  |



TABLE NO. B-1

| Frequency.<br>years | Coefficients | Repon |     |     |     |     |     |    |
|---------------------|--------------|-------|-----|-----|-----|-----|-----|----|
|                     |              | 1     | 2   | 3   | 4   | 5   | 6   | 7  |
| 2                   | <i>K</i>     | 206   | 140 | 106 | 70  | 70  | 68  | 32 |
|                     | <i>b</i>     | 30    | 21  | 17  | 13  | 16  | 14  | 11 |
| 4                   | <i>K</i>     | 247   | 190 | 131 | 97  | 81  | 75  | 48 |
|                     | <i>b</i>     | 29    | 25  | 19  | 16  | 13  | 12  | 12 |
| 10                  | <i>K</i>     | 300   | 230 | 170 | 111 | 111 | 122 | 60 |
|                     | <i>b</i>     | 36    | 29  | 23  | 16  | 17  | 23  | 13 |
| 25                  | <i>K</i>     | 327   | 260 | 230 | 170 | 130 | 155 | 67 |
|                     | <i>b</i>     | 33    | 32  | 30  | 27  | 17  | 26  | 10 |
| 50                  | <i>K</i>     | 315   | 350 | 250 | 187 | 187 | 160 | 65 |
|                     | <i>b</i>     | 28    | 38  | 27  | 24  | 25  | 21  | 8  |
| 100                 | <i>K</i>     | 367   | 375 | 290 | 230 | 240 | 210 | 77 |
|                     | <i>b</i>     | 33    | 36  | 31  | 28  | 29  | 26  | 10 |

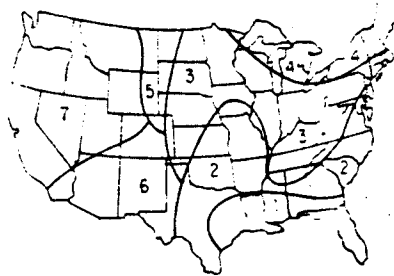


TABLE NO. B-2

| Description of Area    | Runoff Coefficients |
|------------------------|---------------------|
| Business               |                     |
| Downtown               | 0.70 to 0.95        |
| Neighborhood           | 0.50 to 0.70        |
| Residential            |                     |
| Single-family          | 0.30 to 0.50        |
| Multi-units, detached  | 0.40 to 0.60        |
| Multi-units, attached  | 0.60 to 0.75        |
| Residential (suburban) | 0.25 to 0.40        |
| Apartment              | 0.50 to 0.70        |
| Industrial             |                     |
| Light                  | 0.50 to 0.80        |
| Heavy                  | 0.60 to 0.90        |
| Parks, cemeteries      | 0.10 to 0.25        |
| Playgrounds            | 0.20 to 0.35        |
| Railroad yard          | 0.20 to 0.35        |
| Unimproved             | 0.10 to 0.30        |

It often is desirable to develop a composite runoff based on the percentage of different types of surface in the drainage area. This procedure often is applied to typical "sample" blocks as a guide to selection of reasonable values of the coefficient for an entire area. Coefficients with respect to surface type currently in use are:

| Character of Surface    | Runoff Coefficients |
|-------------------------|---------------------|
| Pavement                |                     |
| Asphalt and Concrete    | 0.70 to 0.95        |
| Brick                   | 0.70 to 0.85        |
| Roofs                   | 0.75 to 0.95        |
| Lawns, sandy soil       |                     |
| Flat, 2 percent         | 0.13 to 0.17        |
| Average, 2 to 7 percent | 0.18 to 0.22        |
| Steep, 7 percent        | 0.25 to 0.35        |

The coefficients in these two tabulations are applicable for storms of 5-to 10-yr frequencies. Less frequent, higher intensity storms will require the use of higher coefficients because infiltration and other losses have a proportionally smaller effect on runoff. The coefficients are based on the assumption that the design storm does not occur when the ground surface is frozen.

TABLE NO. B-3

| LAND USE DESCRIPTION   | HYDROLOGIC SOIL GROUP |    |    |    |
|--|-----------------------|----|----|----|
|  | A                     | B  | C  | D  |
| Cultivated land <sup>1/</sup> : without conservation treatment | 72                    | 81 | 88 | 91 |
| : with conservation treatment                                  | 62                    | 71 | 78 | 81 |
| Pasture or range land: poor condition                          | 68                    | 79 | 86 | 89 |
| good condition   | 39                    | 61 | 74 | 80 |
| Meadow: good condition   | 30                    | 58 | 71 | 78 |
| Wood or Forest land: thin stand, poor cover, no mulch          | 45                    | 66 | 77 | 83 |
| good cover <sup>2/</sup>                                       | 25                    | 55 | 70 | 77 |
| Open Spaces, lawns, parks, golf courses, cemeteries, etc.      |                       |    |    |    |
| good condition: grass cover on 75% or more of the area         | 39                    | 61 | 74 | 80 |
| fair condition: grass cover on 50% to 75% of the area          | 49                    | 69 | 79 | 84 |
| Commercial and business areas (35% impervious)                 | 89                    | 92 | 94 | 95 |
| Industrial districts (72% impervious).                         | 81                    | 88 | 91 | 93 |
| Residential: <sup>3/</sup>                                     |                       |    |    |    |
| Average lot size   |                       |    |    |    |
| Average % Impervious <sup>2/</sup>                             |                       |    |    |    |
| 1/8 acre or less   | 65                    | 77 | 85 | 90 |
| 1/4 acre   | 38                    | 61 | 75 | 83 |
| 1/3 acre   | 30                    | 57 | 72 | 81 |
| 1/2 acre   | 25                    | 54 | 70 | 80 |
| 1 acre   | 20                    | 51 | 68 | 79 |
| Paved parking lots, roofs, driveways, etc. <sup>3/</sup>       | 98                    | 98 | 98 | 98 |
| Streets and roads:   |                       |    |    |    |
| paved with curbs and storm sewers <sup>3/</sup>                | 98                    | 98 | 98 | 98 |
| gravel   | 76                    | 85 | 89 | 91 |
| dirt   | 72                    | 82 | 87 | 89 |

<sup>1/</sup> For a more detailed description of agricultural land use curve numbers refer to National Engineering Handbook, Section 4, Hydrology, Chapter 9, Aug. 1972.

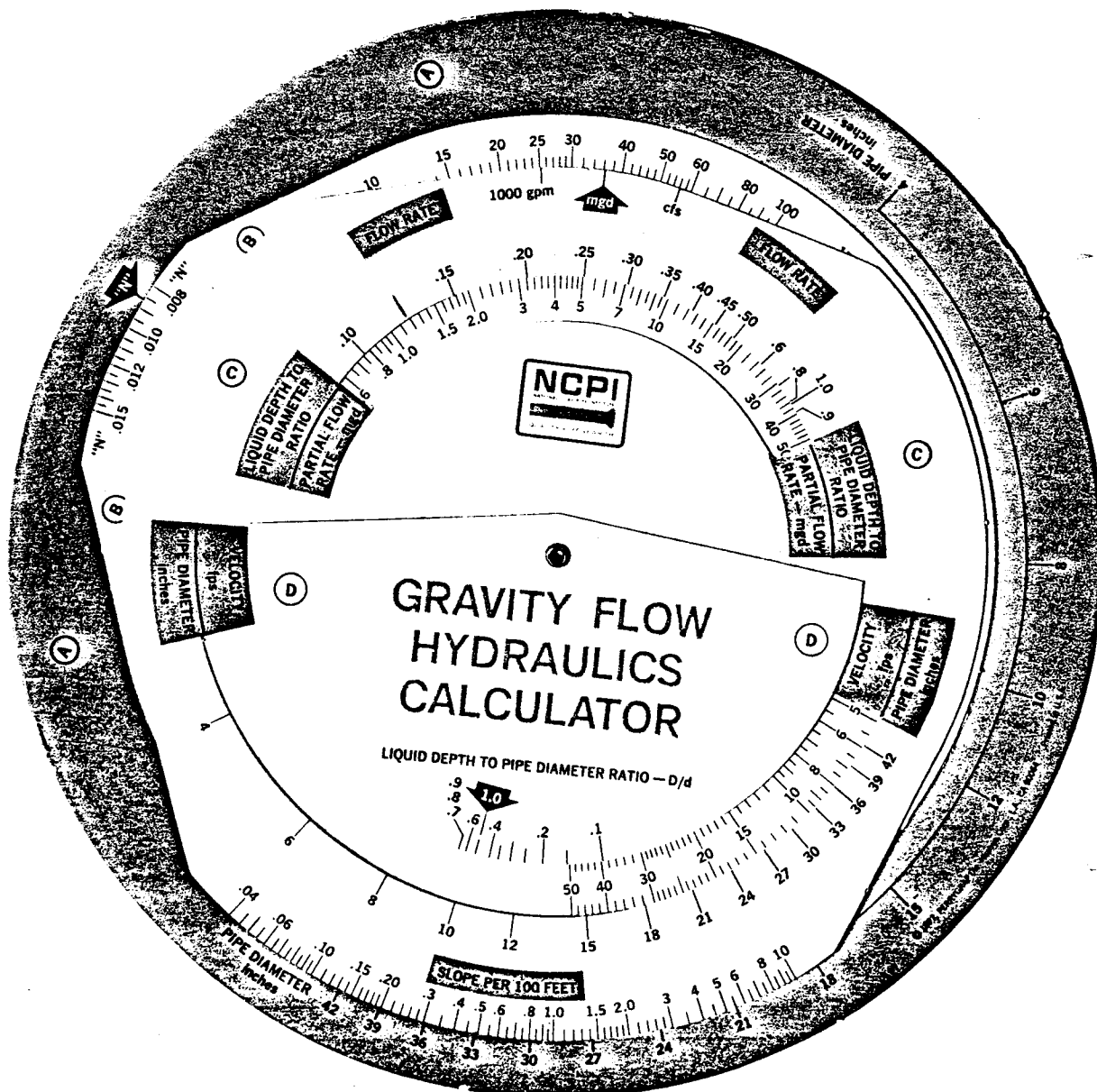
<sup>2/</sup> Good cover is protected from grazing and litter and brush cover soil.

<sup>3/</sup> Curve numbers are computed assuming the runoff from the house and driveway is directed towards the street with a minimum of roof water directed to lawns where additional infiltration could occur.

<sup>2/</sup> The remaining pervious areas (lawn) are considered to be in good pasture condition for these curve numbers.

<sup>3/</sup> In some warmer climates of the country a curve number of 95 may be used.

FIGURE B-1



APPENDIX C

Soils Series and Hydrologic Soil Groups

APPENDIX CSOIL SERIES AND HYDROLOGIC SOIL GROUPS

This appendix provides soil names and their hydrologic classification used in determining soil-cover complexes described in Chapter III of this thesis. The hydrologic parameter A, B, C, or D, is an indicator of the minimum rate of infiltration obtained for a bare soil after prolonged wetting. By using the hydrologic classification and the associated land use, runoff curve numbers can be computed as shown in Chapter II.

The hydrologic soil groups, as defined by SCS soil scientists are:

- A. (Low runoff potential). Soils having a high infiltration rate even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels.
- B. Soils having a moderate infiltration rate when thoroughly wetted and consisting chiefly or moderately deep to deep, moderately well to well drained soils with moderately fine to moderately coarse texture.
- C. Soils having a slow infiltration rate when thoroughly wetted and consisting chiefly or soils with a layer that impedes downward movement of water or soils with moderately fine to fine texture.
- D. (High runoff potential). Soils having a very slow infiltration rate when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a claypan or clay layer at or near the surface, and shallow soils over nearly impervious material.

Table No. 1 of the Appendix was copied from Technical Release No. 55, "Urban Hydrology for Small Watersheds", prepared by the Engineering Division of the Soil Conservation Services, U. S. Department of Agriculture, January, 1975.

Table C-1 -- Soil names and hydrologic classifications

|            |     |             |     |                  |     |               |     |              |     |
|------------|-----|-------------|-----|------------------|-----|---------------|-----|--------------|-----|
| AASTAD     | B   | AKAKA       | A   | ANAOUR           | D   | ARBCK         | B   | ATLEE        | C   |
| ABAJO      | C   | AKASKA      | B   | ANAGCN           | D   | ARBUCKLE      | B   | ATHORE       | B/D |
| ABAJT      | D   | AKELA       | C   | ANALU            | D   | ARCATI        | B   | ATOKA        | C   |
| ABAJTSTOWN | C   | ALADDIN     | B   | AMANA            | B   | AKCH          | B   | ATSIOM       | C   |
| ABEGG      | B   | ALAE        | A   | AMARGOSA         | D   | ARCHABAL      | B   | ATTERBERRY   | B   |
| ABELA      | B   | ALAELOA     | B   | AMARILLC         | B   | ARCHER        | C   | ATTENAN      | A   |
| ABELL      | B   | ALAGA       | A   | AMASA            | B   | ARCHIN        | C   | ATTICA       | B   |
| ABERDEEN   | D   | ALAKAI      | C   | AMBERSON         | B   | ARCO          | B   | ATTLEBORO    | C   |
| ABES       | D   | ALAMA       | C   | ALAMA            | C   | ARGOLA        | C   | ATNATER      | B   |
| ABILENF    | C   | ALAMANCE    | B   | AMBHAM           | C   | ARD           | C   | ATNELL       | C   |
| ABINGTON   | B   | ALAMC       | C   | AMECEE           | A   | ARDEN         | B   | ATHOOD       | B   |
| ABIOUA     | C   | ALAMGSA     | C   | AMELIA           | B   | ARGENVIR      | B   | AUBDEENABEE  | B   |
| ABO        | B   | ALAPAMA     | D   | AMENIA           | B   | ARDILLA       | C   | AUBERRY      | B   |
| ABKA       | C   | ALAPAI      | A   | AMERICUS         | A   | AREDALE       | B   | AUBURN       | C   |
| ABHAMAP    | B   | ALBAN       | B   | AMES             | C   | ARENA         | C   | AUBURDALE    | D   |
| ABSARUKEE  | C   | ALBANO      | D   | AMHERST          | C   | ARENALES      | A   | AUDIAN       | B   |
| ABSCOTA    | B   | ALBANY      | C   | ANITY            | C   | ARENDSVILLE   | B   | AUGRES       | C   |
| ABSHEM     | D   | ALBTON      | D   | AMMON            | B   | ARENOSA       | A   | AUGSBURG     | B   |
| ACACIO     | C   | ALBEE       | C   | AMULE            | C   | ARENZVILLE    | B   | AUGUSTA      | C   |
| ACADEMY    | C   | ALBEMARLE   | B   | AMOR             | B   | ARGONAUT      | D   | AULD         | D   |
| ACADIA     | D   | ALBERTVILLE | C   | AMOS             | C   | ARGUELLO      | B   | AURA         | B   |
| ACEITUNAS  | D   | ALBIA       | C   | AMSTERDAM        | B   | ARGYLE        | B   | AURORA       | C   |
| ACEL       | H   | ALBTON      | B   | AMTCTF           | D   | ARIZO         | A   | AUSTIN       | C   |
| ACKER      | D   | ALBRIGHTS   | C   | AMY              | D   | ARKABUTLA     | C   | AUXVASSE     | D   |
| ACKMEN     | B   | ALCALDE     | C   | ANACAPA          | B   | ARKPORT       | B   | AUZQUI       | B   |
| ACNF       | C   | ALCESTER    | B   | ANAHUAC          | D   | ARLAND        | B   | AVA          | C   |
| ACD        | B   | ALCOA       | B   | ANAMITE          | D   | ARLING        | C   | AVALANCHE    | B   |
| ACILITA    | B   | ALCONA      | B   | ANAPRA           | B   | ARLINGTON     | A   | AVALON       | B   |
| ACTIVE     | C   | ALCOVA      | H   | ANATONE          | D   | ARLOVAL       | C   | AVERY        | B   |
| ACTON      | B   | ALDA        | C   | ANAVERDE         | B   | ARMAGH        | D   | AVON         | C   |
| ACUFF      | B   | ALDAX       | D   | ANCFG            | C   | ARMINGTON     | D   | AVONDALE     | D   |
| ACWORTH    | B   | ALDEN       | C   | ANCMCRAGE        | A   | ARMU          | B   | AVONDALE     | B   |
| ADA        | B   | ALDER       | E   | ANCMGR BAY       | D   | ARMPUR        | B   | AVREY        | D   |
| ADAIN      | D   | ALDERDALE   | C   | ANCMR PGINT      | B   | ARMSTEP       | C   | AXTELL       | D   |
| ADAMS      | A   | ALUERWOOD   | C   | ANCLCTE          | C   | ARMSTKNG      | D   | AYAR         | C   |
| ADAMSON    | B   | ALDINO      | C   | ANCO             | C   | ARPUHEL       | D   | AYCCK        | B   |
| ADAMSTOWN  | C   | ALEKNAGIK   | B   | ANCERS           | C   | BRNEGARD      | B   | AYR          | B   |
| ADAMSVILLE | C   | ALEX        | B   | ANDERSON         | B   | JRNHART       | C   | AYRES        | C   |
| ADATHN     | D   | ALEXANDRIA  | C   | ANDES            | C   | ARNHEIM       | C   | AYRSHIRE     | C   |
| ADAVEN     | D   | ALEXIS      | B   | ANCCRINIA        | C   | ARNO          | D   | AYSEES       | B   |
| ADDISON    | D   | ALFORD      | B   | ANDOVER          | D   | ARNGLD        | B   | AZTALAN      | B   |
| ADY        | C   | ALGANSEE    | B   | ANCREG           | B   | ARNGT         | C/D | AZTEC        | B   |
| ADE        | A   | ALGERS      | C/D | ANCREWS          | C   | AJOCSTOCK     | C   | AZULE        | C   |
| ADEL       | A   | ALGOMA      | B/D | ANED             | D   | AKOSA         | D   | AZWELL       | B   |
| ADELAIDE   | D   | ALICE       | A   | ANETH            | A   | ARP           | D   |              |     |
| ADELANTO   | R   | ALICEL      | H   | ANGELICA         | D   | ARKINGTON     | B   | BABB         | A   |
| DELPHIA    | C   | ALICIA      | C   | ANGELINA         | B/D | ARCLIME       | C   | BABBINGTON   | B   |
| ADENA      | C   | ALIDA       | S   | ANGIE            | C   | ARCN          | C   | BABCOCK      | B   |
| ADILLIS    | A   | ALIKCHI     | B   | ANGLE            | A   | ARRCN         | B   | BABYLON      | A   |
| ADIRONDACK | C   | ALKO        | D   | ANGLEN           | B   | APRNSMITH     | B   | BACA         | C   |
| ADIRONS    | B   | ALLAGASH    | B   | ANGCLA           | C   | ARTA          | C   | BACH         | D   |
| ADLEN      | C   | ALLARD      | B   | ANGSTURA         | B   | ARTCIS        | B   | BACHUS       | B   |
| ADULPH     | D   | ALLEGHENY   | B   | ANIAK            | D   | ARVACA        | D   | BACBONE      | A   |
| AD-TAN     | A/D | ALLEMANS    | D   | ANITA            | D   | ARVANA        | C   | BADENAUGH    | B   |
| AENEAS     | B   | ALLEN       | H   | ANKENY           | A   | ARVESON       | C   | BADGER       | C   |
| AETNA      | B   | ALLENDALE   | C   | ANLAUF           | C   | ARVILLA       | B   | BADGERTON    | C   |
| AFTON      | D   | ALLENSVILLE | C   | ANNABELLA        | A   | ARZELL        | C   | BADO         | D   |
| AGAR       | B   | ALLEATINE   | D   | ANNANGALE        | C   | ASA           | B   | BADUS        | C   |
| AGASSIZ    | D   | ALLENWOOD   | H   | ANNISTON         | B   | ASBUNY        | B   | BAGCAD       | B   |
| AGATE      | D   | ALLEY       | C   | AROKA            | A   | ASCALON       | B   | BAGGOTT      | D   |
| AGHAMAP    | B   | ALLIANCE    | D   | ARONES           | B   | ASCHUFF       | B   | BAGLEY       | B   |
| AGENCY     | C   | ALLIGATOR   | L   | ARSELMC          | A   | ASCHROFT      | B   | BAMEN        | B   |
| AGEM       | D   | ALLIS       | D   | ANSON            | B   | ASHBY         | B   | BAILE        | D   |
| AGNER      | B   | ALLISON     | C   | ANTELOPE SPRINGS | C   | ASHCALE       | C   | BAINVILLE    | C   |
| AGNEW      | B   | ALLOUEZ     | C   | ANTERC           | C   | ASHE          | C   | BAIRD HOLLOW | D   |
| AGOS       | B/C | ALLOWAY     | C   | ANT FLAT         | C   | ASHKUM        | B   | BAJURA       | C   |
| AGUA       | B   | ALPAC       | B   | ANTIGO           | B   | ASHLEY        | A   | BAKEOVEN     | D   |
| AGUADILLA  | A   | ALMENA      | C   | ANTILCA          | B   | ASH SHKINGS   | C   | BAKER        | C   |
| AGUA CULCE | C   | ALMONT      | D   | ANTICCH          | D   | ASHTON        | B   | BAKER PASS   | B   |
| AGUA FRIA  | C   | ALPY        | E   | ANTICCH          | D   | ASHUE         | B   | BALAM        | A   |
| AGUPDA     | B   | ALOMA       | C   | ANTLER           | C   | ASHUEL CT     | C   | BALCH        | D   |
| AGUILITA   | B   | ALUNSO      | B   | ANTCINE          | C   | ASHWOOD       | C   | BALCGM       | B   |
| AGUIVA     | D   | ALVAR       | C   | ANTY             | B   | ASKEN         | C   | BALD         | C   |
| AGUSTIN    | H   | ALPENA      | B   | ANNAY            | B   | ASC           | D   | BALGER       | C   |
| AGATONT    | D   | ALPON       | B   | ANZA             | B   | ASCTIM        | C   | BALDODK      | B/C |
| AGL        | C   | ALPONA      | B   | APACHE           | D   | ASPEN         | B   | BALCHIN      | D   |
| AGLSTON    | C   | ALPS        | H   | APAKUIF          | A   | ASPERMINT     | B   | BALDY        | B   |
| AGLEEK     | B   | ALSEA       | H   | APISHAPA         | C   | ASSIAN.INDINE | E   | BALE         | C   |
| AGMOLT     | D   | ALSTAD      | E   | APISON           | B   | ASSUMPTION    | H   | BALLARD      | B   |
| AGTANUM    | C   | ALSTOWN     | P   | APPIAN           | D   | ASTATULA      | A   | BALLINGER    | C   |
| AGWATER    | C   | ALTMONT     | L   | APPLCATE         | L   | ASTEN         | A/D | BALP         | B/C |
| AGUNTO     | C   | ALTAVISTA   | C   | APPLTCH          | C   | ASTENIA       | B   | BALPAN       | B/C |
| AIKEN      | B   | ALTGRF      | H   | APPLINC          | B   | ATASLADEK     | C   | BALCN        | B   |
| AIRMA      | D   | ALTMAR      | A   | APHCN            | B   | ATCC          | B   | BAL TIC      | D   |
| AILEY      | D   | ALTO        | C   | APT              | C   | ATEPIC        | C   | BALTIMORE    | B   |
| AINAKA     | B   | ALTOGA      | C   | APTAKISIC        | S   | ATHFLWLD      | B   | BAMBER       | B   |
| AINDENT    | C   | ALTUN       | B   | ARABY            | B   | ATHENA        | B   | BAMFGATH     | B   |
| AIPISA     | H   | ALTUS       | B   | ARACA            | B   | ATHENS        | B   | BANCAS       | B   |
| AIPIT      | D   | ALTVAN      | E   | ARAPIEN          | C   | ATHERTON      | C/D | BANCROFT     | B   |
| AITS       | B   | ALVIN       | H   | ARAVE            | D   | ATHLL         | C   | BANCERA      | B   |
|            |     | ALVISA      | C   | ARAVETCN         | E   | ATKINSON      | B   | BANGG        | C   |
|            |     | ALVISO      | D   | ARAFELA          | L   | ATLAS         | D   | BANGUR       | B   |

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table C-1 --Continued

|              |     |               |     |                |     |             |     |               |     |
|--------------|-----|---------------|-----|----------------|-----|-------------|-----|---------------|-----|
| BANGSTON     | A   | BEATTY        | B   | BERTELSON      | A   | BLAKENEY    | C   | BORDA         | D   |
| BANKARD      | A   | BEAUCOUP      | B   | BERTHOUD       | B   | BLAKEPCRT   | B   | BORDEAUX      | B   |
| BANKS        | A   | BEAUFORD      | D   | BERTIE         | C   | BLAMER      | C   | BORDEN        | B   |
| BANNER       | C   | BEAUMONT      | D   | BERTOLTI       | B   | BLANCA      | B   | BORDER        | B   |
| BANNFRVILLE  | C/D | BEAUREGARD    | C   | BERTRANC       | B   | BLANCHARD   | A   | BORNSTEDT     | B   |
| BANNOCK      | B   | BEAUSITE      | B   | BERVILLE       | D   | BLANCHESTER | B/D | BORREGG       | C   |
| BANQUETE     | U   | BEAVERTON     | B   | BERYL          | B   | BLAND       | C   | BORUP         | B   |
| BARABO       | R   | BECK          | C   | BESSEMER       | B   | BLANDFORD   | B   | BORVANT       | D   |
| BARAGA       | C   | BECKER        | B   | BETHANY        | C   | BLANOING    | C   | BORZA         | C   |
| BARBARY      | U   | BECKET        | C   | BETHEL         | D   | BLANEY      | B   | BOSANCK       | B   |
| BARHUR       | B   | BECKLEY       | B   | BETTFIAVIA     | C   | BLANKET     | C   | BOSCO         | D   |
| BARBOURVILLE | H   | BECKTON       | D   | BETTS          | B   | BLANTON     | A   | BOSKET        | B   |
| BARCLAY      | C   | BECKWITH      | C   | BEULAH         | B   | BLANYON     | C   | BOSLER        | B   |
| BARCO        | B   | BECKWORTH     | B   | BEVENT         | B   | BLASINGAME  | C   | BOSQUE        | B   |
| BARCUS       | R   | BECKREEK      | B   | BEVELLY        | B   | BLENCOE     | C   | BOSS          | D   |
| BARO         | D   | BEFCMD        | C   | BEM            | D   | BLENC       | D   | BOSTON        | C   |
| BARD         | C   | BEDINGTON     | B   | BENLEYVILLE    | B   | BLENCOM     | B   | BOSTWICK      | B   |
| BARDEN       | C   | BEDNER        | C   | BENLIN         | D   | BLETHEN     | B   | BOSWELL       | D   |
| BARDLEY      | C   | BEFBE         | A   | BEXAR          | C   | BLEVINS     | B   | BOSWORTH      | D   |
| BARHELA      | D   | BEECHER       | C   | BEZZANT        | B   | BLICHTON    | D   | BOTELLA       | B   |
| BARFIELD     | D   | BEECHER       | C   | BIBB           | B/D | BLISS       | D   | BOTMELL       | C   |
| BARFUSS      | B   | BEEHIVE       | B   | BIBB           | B/D | BLISS       | C   | BOTTINEAU     | C   |
| BARKER       | C   | BEEZAR        | B   | BIBON          | A   | BLOCKTON    | A   | BOTTLE        | A   |
| BARKEVILLE   | C   | BEMANIN       | B   | BICKELTON      | B   | BLOGGETT    | B   | BOULDER       | B   |
| BARKLEY      | B   | BEMANIN       | B   | BICKMORE       | C   | BLOMFORD    | B   | BOULDER LAKE  | D   |
| BARLANE      | D   | BEHEMOTOSH    | B   | BICCONDA       | C   | BLOOM       | A   | BOULDER POINT | D   |
| BARLOW       | B   | BEJUCOS       | B   | BIDDEFORD      | D   | BLOOMFIELD  | C   | BOULFLAT      | D   |
| BARNARD      | D   | BELDEN        | D   | BIDDELMAN      | C   | BLOOMING    | B   | BOURNE        | C   |
| BARNES       | B   | BELDING       | B   | BYOWELL        | B   | BLOGR       | D   | BOURN         | D   |
| BARNESTON    | B   | BELFAST       | B   | BIEBER         | D   | BLOSSOM     | C   | BOY           | A   |
| BARNEY       | A   | BELFIELD      | B   | BIENVILLE      | A   | BLOUNT      | C   | BOYCE         | B/D |
| BARNHARDT    | B   | BELFORE       | B   | BIG BLUE       | D   | BLUCHER     | C   | BOYD          | D   |
| BARNSTAD     | B   | BELGRADE      | B   | BIGEL          | A   | BLUEBELL    | C   | BOYD          | B   |
| BARNUM       | B   | BELINDA       | D   | BIGETTY        | C   | BLUE EARTH  | C   | BOYER         | B   |
| BARNADA      | D   | BELKNAP       | C   | BIGGS          | A   | BLUEJINT    | B   | BOZARTH       | B   |
| BARRINGTON   | B   | BELLAMY       | B   | BIGGSVILLE     | B   | BLUE LAKE   | A   | BOZE          | B   |
| BARRON       | B   | BELLAVISTA    | D   | BIG HORN       | C   | BLUE PINT   | B   | BOZEMAN       | A   |
| BARNONETT    | C   | BELLE         | B   | BIG TIMBER     | D   | BLUE STAK   | B   | BRACEVILLE    | G   |
| BARRIMS      | D   | BELLEFONTAINE | D   | BIGWIN         | A   | BLUENING    | B   | BRACKEN       | C   |
| BARRY        | D   | BELLICUM      | B   | BIJOU          | A   | BLUFFDALE   | C   | BRACKETT      | D   |
| BARSTON      | B   | BELLINGHAM    | C   | BILLET         | A   | BLUFFTON    | D   | BRAD          | D   |
| BARTH        | C   | BELL PINE     | C   | BILLINGS       | C   | BLUFORD     | D   | BRADDOCK      | C   |
| BARTLE       | D   | BELMONT       | B   | BINFORD        | B   | BLU         | B   | BRADENTON     | B/D |
| BARTON       | B   | BELMORE       | B   | BINGHAM        | B   | BLTYHE      | D   | BRADER        | C   |
| BARTONFLAT   | B   | BELT          | D   | BINGSVILLE     | D   | BOARCTREE   | C   | BRADFORD      | B   |
| BARVON       | C   | BELTED        | D   | BINS           | B   | BOBS        | D   | BRADSHAW      | A   |
| BASCUM       | B   | BELTRAMI      | B   | BIPPUS         | B   | BOBTAIL     | B   | BRADWAY       | C   |
| BASEMOR      | D   | BELTSVILLE    | C   | BIRCH          | A   | BOCK        | B   | BRACY         | B   |
| BASHAW       | D   | BELUGA        | C   | BIRCHWOOD      | C   | BOEFNBURG   | B   | BRADYVILLE    | C   |
| BASHFA       | B   | BELVOIR       | C   | BIRDS          | C   | BUOINE      | B   | BRANAM        | B   |
| BASTIE       | D   | BENCLARE      | C   | BIRDSALL       | D   | BOEL        | A   | BRAINERD      | B   |
| BASIN        | C   | BENEVOLA      | C   | BIRDSBORO      | B   | BOELUS      | A   | BRALLIER      | D   |
| BASINGER     | C   | BENEMAW       | C   | BIRDSLEY       | D   | BOETTCHER   | C   | BRAP          | B   |
| BASKET       | C   | BENFIRD       | C   | BIRKBECK       | B   | BOGAN       | C   | BRAPARD       | B   |
| BASS         | A   | BENGE         | B   | BISBEE         | A   | BOGART      | B   | BRAMBLE       | C   |
| BASSEL       | B   | BEN MUR       | B   | BISCAY         | C   | BOGUE       | D   | BRANWELL      | D   |
| BASSETT      | B   | BENIN         | D   | BISMP          | B/C | BOHANNON    | C   | BRAND         | D   |
| BASLER       | D   | BENITO        | D   | BISPING        | B   | BOHEMIAN    | B   | BRANDENBURG   | A   |
| BASTIAN      | D   | BENJAMIN      | D   | BISSELL        | B   | BOJSTFORT   | C   | BRANDON       | B   |
| BASTROP      | B   | BEN LOMOND    | D   | BIT            | D   | BOLAR       | C   | BRANDY WINE   | C   |
| BATAVIA      | B   | BENMAN        | A   | BITTER         | A   | BOLO        | B   | BRANFORD      | B   |
| BATES        | B   | BENNALE       | B   | BITTERCOT      | C   | BOLES       | C   | BRANTFORD     | C   |
| BATH         | C   | BENNETT       | C   | BITTERSPRING   | C   | BOLIVIA     | B   | BRASHEAR      | B   |
| BATTLE CREEK | C   | BENNINGTON    | D   | BITTENSPRING   | C   | BOLTON      | B   | BRASSFIELD    | B   |
| BATZA        | C   | BENOIT        | C   | BIXBY          | B   | BOLTON      | B   | BRATTEN       | B   |
| BAUDETTE     | B   | BENSON        | C/D | BJCRK          | C   | BOMBAY      | B   | BRAXTON       | C   |
| BAUER        | C   | BENTONVILLE   | C   | BLACHLY        | C   | BON         | B   | BRAYMILL      | B/D |
| BAUGH        | B/C | BENZ          | D   | BLACK BUTTE    | C   | BONACCORD   | C   | BRAYS         | D   |
| BAXTER       | B   | BELTIA        | B   | BLACK CANYON   | D   | BONAPARTE   | A   | BRAYTON       | C   |
| BAXTERVILLE  | B   | BELCRAW       | D   | BLACKCAP       | A   | BCND        | C   | BRAZITO       | A   |
| BAYAMON      | B   | BERCAIL       | C   | BLACKETT       | B   | BGNDRANCH   | G   | BRAZOS        | A   |
| BAYARD       | A   | BERDA         | B   | BLACKFOOT      | B   | BCNDURANT   | B   | BRECKENRIDGE  | D   |
| BAYBOND      | D   | BENEA         | C   | BLACKHALL      | D   | BONE        | D   | BRECKNCK      | B   |
| BAYSHORE     | B/C | BENENICETON   | F   | BLACKHAWK      | D   | BONG        | B   | BREECE        | B   |
| BAYSIDE      | C   | BERENT        | A   | BLACKLEAF      | B   | BONHAM      | C   | BREGAR        | D   |
| BAYWORTH     | A   | BERGLAND      | D   | BLACKLOCK      | D   | BONILLA     | B   | BREPER        | B   |
| BAZETT       | C   | BEGSTROM      | B   | BLACKMAN       | C   | BCNITA      | D   | BREPER        | B   |
| BEAD         | C   | BERINO        | B   | BLACK MOUNTAIN | B   | BCAN        | D   | BREMO         | C   |
| BEADLE       | C   | BERKELEY      | C   | BLACKCAK       | C   | BCNNEK      | B   | BREMS         | A   |
| BEALES       | A   | BEKES         | C   | BLACKPIPE      | C   | BONNET      | B   | BRENDA        | C   |
| BEAR BASIN   | B   | BERKSHIRE     | B   | BLACK RIDGE    | C   | BCNNEVILLE  | B   | BRENNAN       | B   |
| BEAR CREEK   | C   | BERLIN        | C   | BLACKRCK       | B   | BCNNICK     | A   |               |     |
| BEARDALL     | C   | BERMUDIAN     | B   | BLACKSTCK      | B   | BONNIE      | C   |               |     |
| BEARDEV      | C   | BERNAL        | C   | BLACKTAIL      | B   | BONJ        | D   |               |     |
| BEARDSTOWN   | C   | BERNALDO      | B   | BLACKWATER     | B   | BONSALL     | D   |               |     |
| BEAR LAKE    | D   | BERNARD       | D   | BLACKWELL      | B/D | BONTA       | C   |               |     |
| BEARMOUTH    | A   | BERNARDINO    | C   | ELADEN         | D   | BCNTI       | C   |               |     |
| BEARPAW      | H   | BERNARDSTON   | C   | BLACC          | D   | BCOKER      | D   |               |     |
| BEAR PRAIRIE | B   | BERNHILL      | B   | BLAINE         | B   | BCOMER      | B   |               |     |
| BEARSKIN     | D   | BERNICE       | A   | BLAIR          | C   | BOUNE       | A   |               |     |
| BEASLEY      | C   | BERNING       | C   | BLAINTON       | C   | BCONESBURG  | B   |               |     |
| BEASLEY      | C   | BERNUNDS      | D   | FLAKE          | C   | BOOTH       | C   |               |     |
| BEATON       | C   | BERKLAND      | D   | FLAKELOD       | A   | BURAH       | A   |               |     |

NOTES: A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED  
TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

January 1971



Table C-1 --Continued

|               |     |              |     |             |     |                |     |               |     |
|---------------|-----|--------------|-----|-------------|-----|----------------|-----|---------------|-----|
| BREMER        | C/D | BUCKLEY      | B/C | CAIG        | B   | CAPUTA         | C   | CATLIN        | B   |
| BRENT         | C   | BUCKLON      | D   | CAIRO       | D   | CARACO         | C   | CATNIP        | B   |
| BRENTON       | B   | BUCKNER      | A   | CAJALCO     | C   | CARALAMPI      | B   | CATCTIN       | C   |
| BRENTWOOD     | B   | BUCKNEY      | A   | CAJEN       | A   | CARBO          | C   | CATLOSA       | B   |
| BRESSER       | B   | BUCKS        | B   | CALABAR     | D   | CARBOL         | D   | CATSKILL      | A   |
| BREYARD       | B   | BUCKSKIN     | C   | CALABASAS   | C   | CARBONDALE     | D   | CATTARAUGUS   | C   |
| BREVORT       | B   | BUCODA       | C   | CALAIS      | C   | CARBURY        | B   | CAUDLE        | C   |
| BREWER        | C   | BUDD         | B   | CALAMINE    | D   | CARDIFF        | B   | CAVE          | D   |
| BREWSTER      | D   | BUDE         | B   | CALAPODYA   | C   | CARCINGTON     | C   | CAVE ROCK     | A   |
| BREWTON       | C   | BUDE         | C   | CALAMAH     | B   | CARON          | D   | CAVE          | D   |
| BRICKEL       | C   | BUELL        | A   | CALCO       | C   | CAREY          | B   | CAVQOE        | C   |
| BRICKTON      | C   | BUENA VISTA  | B   | CALDER      | D   | CAREY LAKE     | B   | CAVCUR        | D   |
| BRIDGE        | C   | BUFFINGTON   | B   | CALDWELL    | B   | CAREYTNW       | D   | CAMKER        | B   |
| BRIDGEHAMPTON | B   | BUFF PEAK    | C   | CALEAST     | C   | CARGILL        | C   | CAYAGUA       | C   |
| BRIDGEPORT    | B   | BUICK        | C   | CALEB       | B   | CARIBE         | B   | CAYLOR        | B   |
| BRIDGER       | A   | BUKREEK      | B   | CALERA      | C   | CARIBEL        | B   | CAYLGA        | C   |
| BRIDGESON     | B/C | BULLION      | D   | CALMI       | A   | CARIBOU        | B   | CAZADERC      | C   |
| BRIDGEVILLE   | B   | BULLREY      | B   | CALHOUN     | D   | CARLIN         | D   | CAZADOR       | B   |
| BRIDGPORT     | B   | BULL RUN     | B   | CALICO      | D   | CARLINTON      | B   | CAZENOVIA     | B   |
| BRIEDWELL     | B   | BULL TRAIL   | B   | CALIFCM     | C   | CARLISLE       | A/D | CEBOLIA       | C   |
| BRIEF         | B   | BULLY        | B   | CALIPUS     | B   | CARLCTTA       | B   | CECIL         | B   |
| BRIENSBURG    | B   | BUMGARD      | B   | CALITA      | B   | CARLEM         | D   | CEDARAH       | D   |
| BRIGGS        | A   | BUNCOMBE     | A   | CALIZA      | A   | CARLSBAD       | C   | CEDAR BUTTE   | C   |
| BRIGGSDALE    | C   | BUNDO        | B   | CALKINS     | C   | CARLSBORG      | A   | CEDAREDOGE    | R   |
| BRIGGSVILLE   | C   | BUNJUG       | C   | CALLAHAN    | C   | CARLSON        | C   | CEDAR HT.     | D   |
| BRIGHTON      | A/D | BUNKER       | D   | CALLEGUAS   | D   | CARLTGN        | B   | CEDARVILLE    | B   |
| BRIGHTWOOD    | C   | BUNSELMEIETP | C   | CALLINGS    | C   | CARMI          | B   | CEDOMIA       | B   |
| BRILL         | B   | BUNTINGVILLE | B/C | CALLCWAY    | C   | CARNEGIE       | B   | CEDRON        | C/D |
| BRIM          | C   | BUNYAN       | B   | CALPAR      | B   | CARNERO        | C   | CELAYA        | B   |
| BRIMFIELD     | C/D | BURBANK      | A   | CALNEVA     | C   | CARNEY         | D   | CELETON       | D   |
| BRINLEY       | B   | BURCH        | B   | CALCUSE     | B   | CAROLINE       | C   | CELINA        | C   |
| BRINEGAR      | B   | BURCHARD     | B   | CALPINE     | B   | CARR           | B   | CELIO         | A   |
| BRINKERTON    | D   | BURCHELL     | B/C | CALVERT     | D   | CARNISALITOS   | D   | CELLAR        | C   |
| BRISCOL       | B   | BURDETT      | C   | CALVERTON   | C   | CARRIZO        | A   | CENCOVE       | B   |
| BRITE         | C   | BUREN        | C   | CALVIN      | C   | CASCO          | D   | CENTER        | C   |
| BRITTON       | C   | BURGESS      | B   | CALVISTA    | D   | CARSON         | D   | CENTER CREEK  | B   |
| BRIZAM        | A   | BURGI        | B   | CAM         | B   | CARSTAIRS      | B   | CENTERFIELD   | B   |
| BRUAD         | C   | BURGIN       | D   | CAMAGUEY    | D   | CANSTUMP       | C   | CENTERVILLE   | D   |
| BROADALBIN    | C   | BURKE        | C   | CAMARGO     | B   | CAPTAGENA      | D   | CENTRALIA     | B   |
| BROADAX       | B   | BURKHARDT    | B   | CAPARILLO   | B/C | CANTECAY       | C   | CENTRAL POINT | B   |
| BROADBROCK    | C   | BURLEIGH     | D   | CAPAS       | A   | CANUSC         | C   | CERESCO       | A   |
| BROAD CANYON  | B   | BUNLESON     | D   | CAPASCREEK  | B/D | CARUTHERSVILLE | B   | CERRILLOS     | C   |
| BROADHEAD     | C   | BURLINGTON   | A   | CAPBERN     | C   | CARVER         | A   | CERRO         | C   |
| BROADHURST    | D   | BURMA        | D   | CAMBRIDGE   | C   | CANWILE        | C   | CINAGRA       | C   |
| BROCK         | D   | BURMESTER    | D   | CAMPEN      | B   | CANYVILLE      | B   | CHAFFEE       | C   |
| BROCKLISS     | C   | BURNAC       | C   | CAMERON     | D   | CASA GRANDE    | C   | CHAGRIN       | B   |
| BROCKMAN      | C   | BURNETTE     | B   | CAPILLUS    | B   | CASCADE        | C   | CHAIK         | B   |
| BROCKPORT     | D   | BURNHAM      | D   | CAMP        | B   | CASCAJO        | B   | CHALFONT      | C   |
| BROCKTON      | D   | BURNSIDE     | B   | CAMPBELL    | B/C | CASCILLA       | B   | CHALMERS      | C   |
| BROCKWAY      | B   | BURNSVILLE   | B   | CAMPBORA    | B   | CASCO          | B   | CHAMA         | B   |
| BRODY         | C   | BURNT LAKE   | B   | CAMPPIA     | B   | CASE           | B   | CHAMBER       | C   |
| BROGAN        | B   | BURRIS       | D   | CAPPQ       | C   | CASEBIER       | U   | CHAMBERINO    | C   |
| BROGDON       | B   | BURT         | D   | CAPPONE     | B/C | CASEY          | C   | CHAMISE       | B   |
| BROLLAR       | D   | BURTON       | B   | CAPPSPASS   | C   | CASHEL         | C   | CHAPKANE      | B   |
| BROMO         | B   | BUSE         | B   | CAPPUS      | B   | CASHION        | D   | CHAPPION      | B   |
| BROMAUGH      | B   | BUSHNELL     | C   | CAPPDENA    | C   | CASHMERE       | B   | CHANCE        | B/D |
| BROMHD        | B   | BUSHVALLEY   | D   | CANA        | C   | CASHPCNT       | B   | CHANDLER      | B   |
| BROMSON       | B   | BUSTER       | C   | CANAAN      | C/D | CASINC         | A   | CHANEY        | C   |
| BROME         | C   | BUTANO       | D   | CANADIAN    | B   | CASITO         | C   | CHANNAMON     | B   |
| BROOKE        | C   | BUTLER       | D   | CANADICE    | D   | CASPAR         | B   | CHANNING      | B   |
| BROOKFIELD    | B   | RUTLERTOWN   | C   | CANANDAIGUA | C   | CASPIANA       | B   | CHANTA        | B   |
| BROOKINGS     | B   | BUTTE        | C   | CANASERAGA  | C   | CASS           | A   | CHANTIER      | D   |
| BROOKLYN      | D   | BUTTERFIELD  | C   | CANAVERAL   | C   | CASSACAGA      | C   | CHAPIN        | C   |
| BROCKSIDE     | C   | BUXIN        | D   | CANDELERC   | C   | CASSIA         | C   | CHAPMAN       | B   |
| BROOKSTON     | B/D | BUXTON       | C   | CANE        | C   | CASSCLAYH      | B   | CHAPPELL      | B   |
| BROOKSVILLE   | D   | BYARS        | D   | CANEADEA    | D   | CASSVILLE      | D   | CHARD         | B   |
| BROSELEY      | B   | BYRON        | A   | CANEK       | B   | CASTAIC        | C   | CHARITON      | D   |
| BROSS         | B   |              |     | CANEL       | B   | CASTALIA       | C   | CHARITY       | D   |
| BROUGHTON     | D   | CABALLO      | C   | CANELCX     | C   | CASTANA        | B   | CHARLESTON    | C   |
| BROWARD       | C   | CABARTON     | C   | CANEY       | C   | CASTELL        | C   | CHARLEVOIX    | B   |
| BROWNELL      | B   | CABBA        | C   | CANEYVILLE  | C   | CASTILE        | B   | CHARLOS       | A   |
| BROWNFIELD    | A   | CADBART      | C   | CANFIELD    | C   | CASING         | C   | CHARLOTTE     | A/D |
| BROWNLEE      | B   | CABEZON      | D   | CANISTEO    | C   | CASTLE         | D   | CHARLTON      | B   |
| BROYLES       | C   | CABIN        | C   | CANNINGER   | B   | CASTLE VALLEY  | D   | CHASE         | C   |
| BRUCE         | D   | CAGINET      | C   | CANDE       | B   | CASTNER        | C   | CHASEBURG     | B   |
| BRUIN         | C   | CABLE        | D   | CANCNCITO   | C   | CASC           | C   | CHASEVILLE    | A   |
| BRUMELL       | B   | CABO RUJO    | C   | CANCA       | B/D | CASKO          | C   | CHASKA        | C   |
| BRUND         | A   | CABOT        | C   | CANTON      | B   | CASTROVILLE    | B   | CHASTAIN      | D   |
| BRUNT         | C   | CACAPUN      | B   | CANTHIL     | B   | CASUSE         | C   | CHATBURN      | B   |
| BRUSETT       | B   | CACHE        | D   | CANTUA      | B   | CASWELL        | B   | CHATFIELD     | B   |
| BRUSH         | B   | CACIQUE      | B   | CANUTIO     | B   | CATALINA       | B   | CHATHAM       | B   |
| BRUSSITT      | B   | CAUOC        | D   | CANYON      | U   | CATALPA        | C   | CHATSORTH     | D   |
| BRYAN         | A   | CADEVILLE    | D   | CAPAL       | B   | CATANO         | A   | CHALNCEY      | C   |
| BRYCAN        | B   | CADMUS       | B   | CAPAY       | D   | CATARINA       | D   | CHAVIES       | B   |
| BRYCE         | D   | CADONA       | C   | CAPI        | D   | CATAULA        | C   | CHANNAREE     | C   |
| BUCAN         | D   | CADON        | C   | CAPE FEAR   | D   | CATANBA        | B   | CNEADLE       | C   |
| BUCHANAN      | C   | CAGEY        | C   | CAPERS      | D   | CATH           | D   | CHECKETT      | D   |
| BUCHENAU      | C   | CAGUABO      | U   | CAPILLE     | D   | CATHCAHT       | B   | CHECHAP       | B   |
| BUCHER        | C   | CAMABA       | B   | CARLFS      | C   | CATHEURAL      | C   | CHEERTWAGA    | D   |
| BUCKINGHAM    | C   | CAMILL       | J   | CAPPS       | B   | CATHERINE      | B/D | CHEESMAN      | B   |
| BUCKLAND      | C   | CAMONE       | C   | CAPSHAW     | C   | CATHN          | D   | CHEMALEM      | C   |
| BUCKLEDAK     | B   | CAMTC        | C   | CAPULIN     | C   | CATLETT        | C/D | CHEPALLIS     | B   |

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table C-1--Continued

|                 |     |                |   |                |     |                |     |               |   |
|-----------------|-----|----------------|---|----------------|-----|----------------|-----|---------------|---|
| CHEMULPUM       | C   | CHUTE          | A | CCACHELLA      | B   | CONALB         | B   | COTITO        | C |
| CHELAN          | B   | CIALES         | D | CCAD           | B   | CONANT         | L   | COTE          | C |
| CHELSEA         | A   | CIALITOS       | B | COAL CREEK     | C   | CONASAUGA      | C   | COTEPAZI      | A |
| CHEMAMA         | R   | CIBEGUE        | R | CCALMONT       | C   | CGATA          | C   | COTT          | B |
| CHEMUNG         |     | CIGU           | D | CCAMP          | C   | CGBCY          | D   | COTTER        | B |
| CHEM            | D   | CIBOLA         | B | CCARSEGLED     | B   | CGCPAS         | C   | COTTERAL      | B |
| CHENA           | A   | CICERO         | D | CCATICOOK      | C   | CGCMO          | C   | COTTIER       | B |
| CHEMANGO        | A   | CIDERCONE      | B | CCGATSBURG     | D   | CGCONGULLY     | B   | COTTICHOOD    | C |
| CHENEY          | B   | CIDRAL         | C | CCOB           | B   | CGCONRO        | D   | COTTRELL      | C |
| CHENNETHY       | C   | CIENEBA        | H | CLBEN          | B   | CGCNEEK        | B   | COUCH         | C |
| CHEMUNATH       | B   | CIPA           | C | COBEY          | D   | CGCUGA         | C   | COUGAR        | C |
| CHEQUIST        | C   | CIPAHRON       | C | CCBPY          | C   | CGCONDIT       | C   | COULSTONE     | B |
| CHEREFFE        | A   | CINCINNATI     | C | CCCMETOPA      | C   | CGDNDON        | C   | COUNTS        | C |
| CHEWFFE         | D   | CINCO          | A | CCCCA          | A   | CGE            | A   | CGUPEVILLE    | B |
| CHEWAY          | C   | CINEBAR        | B | CCCOLALLA      | C   | CGCNEJO        | C   | COUNT         | B |
| CHERRYMILL      | C   | CIACLE         | C | CCDCMUS        | C   | CGGESTUGA      | B   | COURTHOUSE    | D |
| CHEFFRY SPRINGS | D   | CIRCLEVILLE    | C | CCODY          | A   | CGGESUS        | B   | COURTLAND     | B |
| CHEGAN          | B   | CISNE          | D | CCCE           | A   | CGCGAREE       | B   | COURTNEY      | D |
| CHESHIRE        | B   | CISPIUS        | A | CCCBURN        | C   | CGCNI          | D   | COURTROC      | B |
| CHESHMINA       | D   | CITICO         | B | CCCF           | D   | CGCLEN         | B   | COUSE         | C |
| CHESNIMUS       | B   | CLACKAMAS      | C | CCGGON         | B   | CGCLEY         | C   | COUSHATTA     | B |
| CHESTER         | B   | CLAIBORNE      | B | CCGSMELL       | C   | CGCENNAUT      | C   | COVE          | D |
| CHESTERTON      | C   | CLAIRE         | A | CCOMASSET      | B   | CGCONNECTICUT  | B   | COVELL        | B |
| CHECTI          | D   | CLATREMONT     | B | CCCGCTAH       | D   | CGCENNER       | B   | COVELAND      | C |
| CHECTEK         | B   | CLALLAM        | B | CCCMCE         | B   | CGCONOTOM      | B   | COVENTRY      | B |
| CHEVELIN        | C   | CLAM GULCH     | C | CCGIT          | C   | CGCNGVER       | C   | COVETOWN      | C |
| CHEWACLA        | C   | CLAND          | C | CCCKEDALE      | C   | CGCUNWINGU     | B   | COVINGTON     | D |
| CHEWELAH        | B   | CLANTON        | C | CCCKEL         | C   | CGCONRAD       | B   | COVAN         | A |
| CHEYENNE        | B   | CLAPPER        | B | CCCKER         | D   | CGCARLE        | B   | COVARTS       | C |
| CHIARA          | D   | CLAREMURE      | C | CCCKESBURY     | D   | CGCNSER        | C/D | COVON         | D |
| CHEKASHA        | B   | CLARENCE       | B | CCCKEVILLE     | B   | CGCNSTABLE     | A   | COVY          | C |
| CHICOPPE        | B   | CLARESON       | C | CCCLBATH       | C/D | CGCONSUMO      | B   | COVEMAN       | C |
| CHICOT          | D   | CLAREVILLE     | C | CCCLBERT       | D   | CGCONTINENTAL  | C   | COVERS        | B |
| CHIGLEY         | C   | CLARINDA       | D | CCCLBURN       | B   | CGCONTHA COSTA | C   | COVICINE      | B |
| CHILCOTT        | D   | CLARION        | B | CCCLBY         | B   | CGCONVENT      | C   | COVOD         | C |
| CHILDS          | B   | CLARITA        | D | CCCLCHESTER    | B   | CCOOK          | D   | COX           | D |
| CHILGREN        | C   | CLARK          | B | CCCLDEN        | B   | CCCGKPORT      | C   | COXVILLE      | D |
| CHILHOWIE       | C   | CLARK FORK     | A | CCCLD SPRINGS  | C   | CCCOLBWITH     | B   | COYATA        | C |
| CHILL           | B   | CLARKSBURG     | C | CCCLE          | B/C | CCCOLVILLE     | C   | COZAD         | B |
| CHILLICOTHE     | C   | CLARKSDALE     | C | CCCLLEBRCK     | B   | CCCOMBS        | B   | CRABTON       | B |
| CHILLISQUAKE    | B   | CLARKSON       | B | CCCOLEMAN      | C   | CCCOLNEY       | B   | CRADDOCK      | B |
| CHILLUM         | B   | CLARKSVILLE    | B | CCCOLEMANTOWN  | D   | CCCOOPER       | C   | CRADENBAUGH   | D |
| CHILMARK        | B   | CLARNO         | B | CCCLETO        | A   | CCCOCTER       | C   | CRAFTON       | C |
| CHILU           | B/D | CLARKY         | B | CCCLFAX        | C   | CCCPAKE        | B   | CRAGO         | B |
| CHILQUIN        | B   | CLATO          | B | CCCLINAS       | B   | CCCPALIS       | B   | CRAGI         | C |
| CHILSON         | D   | CLATSOP        | D | CCCLAMER       | C   | CCCPFLAND      | B/D | CRAGMAY       | C |
| CHILTON         | B   | CLAVELACK      | C | CCCLLARD       | B   | CCCPITA        | B   | CRAPER        | D |
| CHIMAY          | C   | CLAWSON        | C | CCCLLBRAN      | C   | CCCLPLAY       | C   | CRABE         | B |
| CHIMNEY         | B   | CLAYBURN       | B | CCCLLEEN       | C   | CCCPPER RIVER  | D   | CRANSTON      | B |
| CHINA CREEK     | B   | CLAYS SPRINGS  | D | CCCLLEGATE     | C   | CCCPPEXTON     | B   | CRARY         | C |
| CHINCHALLO      | B/D | CLAYTON        | B | CCCELLETT      | C   | CCCPPOCK       | B   | CRATER LAKE   | B |
| CHINIAK         | A   | CLEARFIELD     | D | CCCOLLIER      | A   | CCCPSEY        | B   | CRAVEN        | C |
| CHINO           | B/C | CLEAR LAKE     | C | CCCOLLINGTON   | B   | CCCGUILLE      | C/D | CRABFOHD      | D |
| CHINDUK         | B   | CLEEK          | C | CCCOLLIAS      | C   | CCCGWA         | D   | CREAL         | D |
| CHIPETA         | D   | CLE FLUM       | B | CCCOLLINSTON   | C   | CCCGHAL        | C   | CREBBIN       | C |
| CHIPLEY         | C   | CLEGG          | B | CCCOLLINSVILLE | C   | CCCORDETT      | C   | CREEDMAN      | U |
| CHIPMAN         | C   | CLEMAN         | B | CCCLPA         | B   | CCCORBIN       | B   | CREEDMOOR     | C |
| CHIPPENY        | D   | CLEMVILLE      | B | CCCLMCR        | C   | CCCORCEGA      | C   | CREIGHTON     | B |
| CHIPPEWA        | B/D | CLORA          | B | CCCLC          | B   | CCCLC          | C   | CREIDON       | B |
| CHIQUITU        | C   | CLERF          | B | CCCLCKMUP      | B   | CCCORCES       | B   | CRESBARD      | C |
| CHIRICAMUA      | D   | CLERMONT       | C | CCCLCMA        | A   | CCCGRINDVA     | C   | CRESCENT      | B |
| CHITINA         | B   | CLEVERLY       | A | CCCLCMB        | B   | CCCGRINTH      | B   | CRESCG        | C |
| CHITTENDEN      | C   | CLIFFDOWN      | C | CCCLCNA        | C   | CCCGRINDALE    | B   | CREST         | C |
| CHITWOU         | C   | CLIFFHOUSE     | C | CCCLCNIE       | A   | CCCGLENA       | A   | CRESTLINE     | B |
| CHIVATI         | D   | CLIFFORD       | B | CCCLCRADG      | B   | CCCOLLETT      | B   | CRESTMORE     | B |
| CHIWANA         | B   | CLIFFWOOD      | C | CCCLCRCK       | D   | CCCORLEY       | C   | CRESTON       | C |
| CHI             | C   | CLIFFERSON     | B | CCCLCSE        | D   | CCCURMANT      | C   | CRESWELL      | A |
| CHREE           | D   | CLIFTON        | C | CCCLCSE        | A   | CCCHAMILL      | B   | CRETE         | D |
| CHUCK           | B/D | CLIFTY         | B | CCCLP          | D   | CCCORNING      | D   | CREVA         | D |
| CHCCOLSCD       | B   | CLIMAKA        | D | CCCLPAIN       | B   | CCCORNUY       | C   | CREVASSE      | A |
| CHUPANA         | C   | CLIMAX         | C | CCCLTCN        | A   | CCCORNVILLE    | B   | CREWS         | D |
| CHUPIANK        | A   | CLIME          | C | CCCLTS NECK    | B   | CCCGHZAL       | C   | CRIDER        | B |
| CHUPIE          | D   | CLINTON        | B | CCCLUMBIA      | B   | CCCGPPENING    | D   | CRIP          | B |
| CHTRALMONT      | B   | CLODINE        | C | CCCLUPINE      | A   | CCCORRALITOS   | A   | CRISFIELD     | B |
| CHITAU          | C   | CLONTAMP       | B | CCCLUSA        | C   | CCCORKEO       | C   | CRITCHMELL    | B |
| CHRISTIAN       | C   | CLUQUALLUM     | C | CCCLVILLE      | B   | CCCORPHERA     | D   | CRIVITZ       | A |
| CHRISTIANA      | B   | CLUQUATO       | B | CCCLVIN        | C   | CCCORSON       | C   | CRICKER       | A |
| CHRISTIANBURG   | D   | CLQUET         | D | CCCLWGD        | B/D | CCCORTEZ       | D   | CRICKETT      | D |
| CHRISTY         | B   | CLOUD          | D | CCCLYER        | C/D | CCCORVINA      | A   | CROFTON       | B |
| CHROME          | C   | CLUDCROFT      | C | CCCMERIC       | B   | CCCGUNNA       | C   | CROGMAN       | B |
| CHUALAF         | B   | CLOUD PEAK     | B | CCCMETA        | C   | CCCGVALLIS     | B   | CRICKED       | C |
| CHUBBS          | C   | CLOUD RIM      | B | CCCMFREY       | C   | CCCORNIA       | B   | CRICKED CREEK | D |
| CHUCKAWALLA     | B   | CLUGM          | D | CCCMITAS       | A   | CCCHY          | C   | CRICKSTON     | B |
| CHULTNA         | B   | CLOVERDALE     | D | CCCOMPLY       | C   | CCCGRYGUM      | C   | CRICH         | B |
| CHUMMY          | C   | CLOVER SPRINGS | B | CCCMPPERCE     | C   | CCCOSAC        | C   | CRIGLEY       | C |
| CHUMSTICK       | C   | CLLVIS         | B | CCCLPO         | A   | CCCOSY         | C   | CROSBY        | C |
| CHUPADERA       | B   | CLUFF          | C | CCCMODNE       | B   | CCCSHCCTON     | B   | CROSS         | D |
| MURCH           | D   | CLUNIE         | D | CCCMPCRO       | B   | CCCSKI         | B   | CROSSVILLE    | B |
| MURCHILL        | D   | CLURO          | C | CCCMPTCHE      | B   | CCCSSAYUNA     | C   | CROSSWELL     | A |
| MURCHVILLE      | D   | CLURC          | C | CCCMPTCN       | C   | CCCGSTILLA     | A   | CROT          | D |
| MURN            | B   | CLYDE          | C | CCCLPSTOCK     | C   | CCCLTAGU       | C   | CROTON        | D |
| MURNUASHEK      | B   | CLYMER         | B | CCCPUS         | B   | CCCOTATI       | C   | CROUCH        | B |

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table C-1--Continued

|                 |     |             |     |                 |     |             |   |              |     |
|-----------------|-----|-------------|-----|-----------------|-----|-------------|---|--------------|-----|
| CROW            | C   | DANZ        | B   | DEL REY         | C   | DIXPONT     | C | DRY CREEK    | C   |
| CROW CREEK      | B   | DARGOL      | D   | DEL RIO         | C   | DIXMORE     | B | DRYDEN       | B   |
| CROWFOOT        | C   | DAKIN       | C   | DELTA           | C   | DIXONVILLE  | L | DRY LAKE     | C   |
| CROWNHEART      | B   | DARLING     | B   | DELTON          | B   | DIXVILLE    | A | DUBANE       | B   |
| CROW HILL       | C   | DARNELL     | C   | DELWIN          | A   | COAK        | C | DUBAKELLA    | C   |
| CROWLEY         | D   | DARNEN      | B   | DELYNDIA        | B   | ULBBS       | B | DUBAY        | D   |
| CROWN           | B   | DAHR        | A   | DEMAST          | B   | DOBY        | D | DUBBS        | B   |
| CROWN SHAM      | B   | CARRET      | C   | DEMASTERS       | B   | DECCAS      | R | DUBCIS       | C   |
| CRUIZIER        | C   | DARROGH     | C   | DE MAYA         | C   | DECKERY     | C | DUBUQUE      | B   |
| CRUCKTON        | B   | CART        | A   | DEPERS          | D   | DEGCT       | B | DUCEY        | B   |
| CRUICKSHANK     | C   | CAPVADA     | D   | DEPKY           | D   | DOUGE       | B | DUCHE SNE    | A   |
| CRUME           | B   | DAHWIN      | D   | DEPONA          | C   | DOUGEVILLE  | B | DUCKETT      | C   |
| CRUMP           | D   | CASSEL      | C   | DEMPCLIS        | C   | DUDSON      | C | DUCCA        | D   |
| CRUTCH          | B   | JATCMAN     | C   | DEMPSTER        | B   | DUGER       | A | DUDA         | A   |
| CRUTCHFP        | D   | DATINO      | C   | DENAY           | B   | EGGUE       | C | DUDLEY       | D   |
| CRUZL           | C   | DATWYLER    | C   | DENISON         | C   | ECLAND      | B | DUEL         | B   |
| CRYSTAL LAKE    | R   | CAULTON     | D   | DENMARK         | D   | OCLF        | C | DUELM        | C   |
| CRYSTAL SPRINGS | D   | CAUPPIN     | C   | DENNIS          | C   | OCLLAR      | H | DUFFAU       | B   |
| CRYSTOLA        | S   | DAVEY       | A   | DENNY           | D   | OGLLARD     | C | DUFFER       | D   |
| CUBA            | R   | DAVIDSON    | H   | DENROCK         | D   | DOLGRES     | B | DUFFIELD     | B   |
| CUBERANT        | B   | DAVIS       | B   | DEATCM          | D   | DULPH       | C | DUFFSON      | B   |
| CUCHILLAS       | D   | DAVISON     | R   | DEAVER          | C   | DOMINGO     | C | DUFFY        | B   |
| CUDAHY          | D   | DAMES       | C   | DEPEH           | C   | DGMINGUEZ   | C | DUFUR        | B   |
| CUDIYI          | B   | DAWCO       | B/D | DEPCE           | D   | DGMINIC     | A | DUGGINS      | D   |
| CUEBI           | B   | DAWSON      | D   | DERINDA         | D   | DCNA ANA    | B | DUGGUT       | D   |
| CUEVA           | D   | DAY         | D   | DESAN           | A   | DLNLD       | E | DUGWAY       | C   |
| CUEVITAS        | D   | DAYBELL     | A   | DESART          | C   | DMEGAL      | C | DUKES        | A   |
| CULLEN          | C   | DAYTON      | D   | DESCALBRADO     | D   | DMERAIL     | C | CULAC        | C   |
| CULLEOKA        | B   | DAYVILLE    | B/C | DESCHUTES       | C   | DMONERAIL   | C | DUMAS        | B   |
| CULLO           | D   | GAZE        | D   | DESERET         | C   | DNICA       | A | DUMECO       | C   |
| CULPEPER        | C   | DEACON      | B   | DESPA           | D   | DCALCOTN    | C | DUMPT        | C   |
| CULPERS         | C   | DEADFALL    | B   | DESPLER         | C   | DCNNA       | D | DUNBAR       | D   |
| CUMBERLAND      | B   | DEAMA       | C   | DESPLATIN       | C   | DCANN       | C | DUNBARTON    | C   |
| CUMLEY          | C   | DEAN        | H   | DESPAIN         | B   | DUNNYBROOK  | D | DUNBRIDGE    | B   |
| CUMMINGS        | B/D | DEAN LAKE   | C   | DETER           | C   | DCNCVAN     | B | DUCAN        | D   |
| CUNICO          | C   | DEARDURFF   | B   | DETLCH          | C   | COULEY      | A | DUCANNON     | B   |
| CUPPER          | R   | DEARY       | C   | DETCUR          | C   | CCONE       | E | DUCOM        | D   |
| CURDLI          | C   | DEARVTON    | R   | DETCIT          | C   | DCOR        | B | DUNCAS       | C   |
| CURECANTI       | H   | DEATHAN     | C   | DEV             | B   | DORA        | D | DUNCAY       | A   |
| CUNLEN          | C   | DEAVER      | C   | DEVILS CIVE     | D   | CGRAN       | C | LUNCCE       | C   |
| CUNNAN          | C   | DEPENTER    | C   | DEVEL           | B   | CGRCHESTER  | E | DUNELLEN     | B   |
| CURRANT         | B   | DECAN       | D   | DEVEN           | B   | CDKOSHIN    | C | CUNE SAND    | A   |
| CURTIS CREEK    | D   | DECATHON    | D   | DEVCRE          | H   | CDWUTHEA    | C | DUNGENESS    | R   |
| CURTIS SIDING   | A   | DECATUR     | B   | DEWHT           | D   | CDRCVAN     | D | DUN GLEN     | C   |
| CUSHING         | B   | DECCA       | R   | DEWEY           | H   | CDGS        | B | DUNKINSVILLE | B   |
| CUSHMAN         | C   | DECKER      | C   | DEWVILLE        | H   | CDKSET      | H | DUNKIRK      | B   |
| CUSTFR          | C   | DECKERVILLE | C   | DEXTER          | H   | CDG CALAZAS | C | DUNLAP       | B   |
| CUTTER          | D   | DECLC       | E   | DIA             | C   | DCSSMAN     | B | DUNPORE      | B   |
| CUTZ            | D   | DECOHRA     | B   | DIARLC          | D   | CDOTHAN     | B | DUNTING      | G   |
| CUYAMA          | R   | DECRUSS     | B   | DIAMOND         | C   | CDOTTA      | H | DUNPHY       | C   |
| CYLINDER        | B   | DEE         | C   | DIAMOND SPRINGS | C   | CDUTY       | B | DUNVILLE     | B   |
| CYNTHIANA       | C/D | DEEPWATER   | C   | DIAZ            | C   | CDUBLETOP   | B | DUPAGE       | B   |
| CYPRERHINT      | C   | DEER CREEK  | C   | DIBBLE          | C   | CDUCS       | B | CUPEE        | C   |
| CYNIL           | B   | DEERFIELD   | B   | DICK            | A   | CDOUCHERTY  | A | DUPLIN       | C   |
|                 |     | DEERFORD    | D   | DICKKEY         | A   | CDOUGHTY    | A | DUPC         | C   |
|                 |     | DEERING     | C   | DICKINSON       | A   | CDUGGLAS    | B | DUPENT       | C   |
| DABOB           | B   | DEERLODGE   | D   | DICKSON         | C   | CDUIC       | B | DUPREE       | D   |
| DACINA          | C   | DEER PARK   | A   | DIGBY           | C   | CDUVER      | B | DURALDE      | C   |
| DADE            | A   | DEEXTON     | B   | DIGGER          | C   | CDVRAY      | D | DURAND       | B   |
| DAFER           | B   | DEERTAIL    | C   | DIGHTON         | B   | CDW         | B | DURANT       | D   |
| DAGGETT         | A   | DEFIANCE    | D   | DILL            | B   | CDWAGIAC    | B | DURRELLE     | B   |
| DAQUIM          | D   | DEFORD      | D   | LILLARD         | C   | CDWOEN      | C | DURHAM       | B   |
| DAUGH           | B   | DEGARD      | B/C | DILLCWA         | C   | CDWELLTON   | D | DURKEE       | C   |
| DAGUINI         | C   | DEGNER      | C   | DILLINGER       | B   | CDWNEK      | B | DURCC        | B   |
| DAGUEY          | C   | DE GREY     | D   | DILLON          | D   | CDWNEY      | B | DURRSTEIN    | D   |
| DAHLQUIST       | B   | DE JAHNET   | B   | DILLWYN         | A   | CDWNS       | B | DUTCHESS     | B   |
| DAIGLE          | C   | DEKALB      | C   | DILPAN          | C   | CDXIE       | C | DUTSON       | D   |
| DAILEY          | A   | DEKOVFN     | D   | DILTS           | D   | CDYCE       | C | DUTTON       | D   |
| DAKOTA          | B   | DELAKE      | B   | DILLWORTH       | C   | CDYLE       | A | DUYAL        | B   |
| DALBO           | B   | DELANEY     | A   | DIPAL           | C   | CDYLE       | A | DUZEL        | B   |
| DALBY           | D   | DELANO      | H   | DIPYAW          | C   | CDYLESTEWN  | D | ENIGHT       | D   |
| DALE            | B   | DELECO      | L   | DINGLE          | B   | CDLYN       | C | JMYER        | A   |
| DALHART         | B   | DELENA      | C   | DINGLISHAA      | C   | CDKA        | C | EYE          | D   |
| DALLAN          | H   | DELFINA     | D   | DINKELMAN       | B   | CDRACUT     | C | EYER         | C   |
| DALTON          | B   | DELHI       | A   | DINKEY          | A   | CDRAGE      | B | DYKE         | E   |
| DALUPF          | D   | DELICIAS    | J   | DINNEN          | B   | CDRAGON     | B | DYRENG       | U   |
| DAMASCUS        | D   | DELNS       | B/D | DINSCALE        | B   | CDRAGSTON   | C |              |     |
| DAMON           | D   | DELL        | C   | DINGHA          | B/C | CDRAIN      | C | EAD          | C   |
| DANA            | B   | DELLER      | U   | DINZEN          | B   | CDRAKE      | B | EAGAR        | E   |
| DANAHAY         | C   | DELLER      | A/C | DIXICE          | C   | CDRANUN     | B | EAGLECONE    | B   |
| DANEY           | C   | DELLC       | A/C | DIXQUE          | B   | CDRAPEN     | C | EAKIN        | B   |
| DANDY           | C   | DELLROSE    | E   | DIXAPEL         | D   | CDRESLEN    | B | EAPES        | B   |
| DANDY PA        | D   | DELM        | D   | DIXAUTEL        | D   | CDRESSLER   | C | EARLE        | U   |
| DANDRIDGE       | D   | DELMAR      | D   | DISCC           | F   | CDREWS      | B | EAKLMONT     | B/C |
| DANDRENG        | D   | DELMITA     | C   | DIXNER          | D   | CDRIFTON    | C | EARP         | B   |
| DANIELS         | B   | DELMONT     | H   | DIXSTERHEFF     | C   | CDRIGGS     | H | EASLEY       | U   |
| DANKU           | D   | DELCORTE    | L   | DIXCAMP         | C   | CDRUM       | C | EAST FORK    | C   |
| DANLEY          | D   | DELPHI      | B   | DIXVCS          | B   | CDRUMPH     | R | EAST LAKE    | A   |
| DANNENBERG      | B   | DELPHILL    | C   | DIXVIE          | B   | CDRUPPOND   | C | EASTLAD      | C   |
| DANSHIN         | J   | DELPIDRA    | C   | DIX             | A   | CDRUNKY     | B | EASTON       | C   |
| DANT            | C   | DELPINE     | D   | DIXIE           | C   | CDRYAC      | C | EASTONVILLE  | A   |
| DANVENS         | C   | DELRAY      | A/D |                 |     | CDRYBURG    | B | EAST PARK    | D   |
| DANVILLE        | C   |             |     |                 |     |             |   |              |     |

NOTES: A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED  
 THO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/IMPAIRED SITE-

Table C-1 --Continued

|              |     |            |     |             |     |              |     |              |     |
|--------------|-----|------------|-----|-------------|-----|--------------|-----|--------------|-----|
| EASTPICT     | A   | ELLISON    | B   | FSPEND      | B   | FARNUM       | B   | FLEISCHMANN  | D   |
| EATONTOWN    |     | ELLOAM     | C   | ESPANTO     | B   | FARRAGUT     | C   | FLEPING      | C   |
| EAGALLIE     | B/D | ELLSBERRY  |     | ESPIAL      | D   | FARRAR       | B   | FLETCHER     | B   |
| EBA          | C   | FLLSWORTH  | C   | ESPINAL     | A   | FARHELL      | B   | FLOKE        | D   |
| EBHFKT       | D   | ELMA       | B   | ESGLATZEL   | B   | FARHENDURG   | B   | FLOP         | C   |
| EBS          | H   | FLMDALE    | B   | ESS         | B   | FARKOT       | C   | FLOPATION    | A   |
| EBENEZIR     | C   | FLMIRA     | A   | ESSEN       | C   | FARSON       | B   | FLORENCE     | C   |
| ECLLES       | H   | ELMC       | C   | ESSEX       | C   | FARWELL      | C   | FLORIDANA    | B/D |
| ECHAND       | C   | ELMCAT     | B   | ESSEXVILLE  | D   | FATIMA       | B   | FLORISSANT   | C   |
| ECHLEK       | B   | ELMORE     | B   | LSTACADO    | B   | FATTIG       | C   | FLONELL      | C   |
| ECKLEY       | B   | ELMWOOD    | C   | ESTELLINE   | B   | FAUNCE       | A   | FLOMREE      | B   |
| ECKMAN       | B   | ELNORA     | B   | ESTER       | D   | FAUGUIER     | C   | FLOYD        | B   |
| ECKRANT      | D   | ELONKA     | B   | ESTERBRCKM  | B   | FAMCETT      | C   | FLUSHING     | C   |
| ECTOH        | C   | ELPAK      | D   | ESTHERVILLE | B   | FAMK         | B   | FLUVANNA     | C   |
| EDALGO       | C   | EL PECO    | C   | ESTO        | C   | FAXON        | D   | FLYGARE      | B   |
| EDDS         | B   | EL RANCHO  | B   | ESTRELLA    | B   | FAYAL        | B   | FLYNN        | B   |
| EDDY         | C   | ELRED      | B/D | ETHAN       | B   | FAYETTE      | B   | FOARD        | D   |
| EDENTON      | C   | ELRED      | B/D | ETHETE      | B   | FAYETTEVILLE | B   | FOGELSVILLE  | B   |
| EDENVALE     | C   | ELS        | A   | ETHRIDGE    | C   | FAYWCGD      | C   | FOLA         | B   |
| EDGAN        | D   | ELSAH      | B   | ETIL        | A   | FE           | D   | FOLEY        | D   |
| EDGEUMRE     | B   | ELSTABORU  | B   | ETNA        | B   | FEDORA       | B   | FONDA        | O   |
| EDGELEY      | C   | ELSMFRE    | A   | ETNAH       | B   | FELDA        | B/D | FONCIS       | C   |
| EDGEMUNT     | B   | ELSO       | D   | ETCWN       | B   | FELIDA       | B   | FONTAL       | C   |
| EDGEWATER    | C   | EL SCLYO   | C   | ETTA        | C   | FELLOWSHIP   | D   | FONTREEM     | C   |
| EDGEWICK     | B   | ELSTON     | B   | ETTER       | B   | FELT         | B   | FOPIANC      | D   |
| EDGEWOOD     | A   | ELYTOPIA   | P   | ETTERSBURO  | B   | FELTA        | C   | FORBES       | B   |
| EDGINGTON    | C   | ELTREE     | D   | ETTRICK     | D   | FELTMAN      | A   | FORC         | O   |
| EDINA        | D   | ELTSAC     | D   | EUBANKS     | B   | FELTGA       | B   | FORDNEY      | A   |
| EDINBURG     | C   | ELWHA      | B   | EUDORA      | B   | FELTUNIA     | B   | FORDVILLE    | B   |
| EDISON       | B   | ELWOOD     | C   | EUFULA      | A   | FENCE        | B   | FORE         | D   |
| EDISTO       | C   | ELY        | B   | LUREKA      | D   | FENDALL      | C   | FORELAND     | C   |
| EDITH        | A   | ELYSIAN    | B   | EUSTIS      | A   | FENWOOD      | B   | FORELLE      | C   |
| EDLOE        | B   | ELZINGA    | B   | EUTAW       | D   | FERDELFOND   | C   | FORSHAN      | B   |
| EDMONDS      | C   | EMODEN     | B   | EVANGELINE  | C   | FERDIG       | C   | FORESTDALE   | D   |
| EDMONF       | D   | EMDEAT     | C   | EVANS       | B   | FERGUS       | B   | FORESTER     | C   |
| EDMUND       | C   | EMER       | C   | EVANSTON    | B   | FERGUSON     | B   | FORGAY       | A   |
| EDMUND       | C   | EMERALD    | B   | EVANG       | A   | FERNANDG     | C   | FORPAN       | B   |
| EDNA         | D   | EMERSON    | D   | EVART       | D   | FERNOALE     | C   | FORNEY       | D   |
| EDNEYVILLT   | B   | EMIDA      | D   | EVENDALE    | B   | FERNLEY      | C   | FORREST      | C   |
| EDOM         | C   | EMIGRANT   | D   | EVERETT     | B   | FERNON       | C   | FORSEY       | C   |
| EDSON        | C   | EMIGRATION | D   | EVERGLADES  | B/D | FERKPCINT    | C   | FORSREN      | C   |
| EDWARDS      | B/D | EMILY      | B   | EVENLY      | B   | FERRALO      | B   | FORT GGLINS  | B   |
| EEL          | C   | EMLIN      | B   | EVERMAN     | C   | FERRIS       | D   | FORT DRUM    | C   |
| EFFINGTON    | D   | EMMA       | C   | EVERSON     | C   | FERRON       | B   | FORT LYON    | B   |
| EFWUN        | A   | EMMERT     | A   | EVESBORC    | A   | FERTALINE    | D   | FORT MEADE   | A   |
| EGAN         | C   | EMMET      | B   | EWA         | B   | FESTINA      | B   | FORT NGTT    | A   |
| EGAN         | B   | EMMCAS     | C   | EMAIL       | A   | FETTIC       | C   | FORT PIERCE  | C   |
| EGBERT       | B/C | EMGRY      | B   | EWINGSVILLE | B   | FIANDER      | D   | FORT ROCK    | C   |
| EGELAND      | B   | EMPEY      | B   | EXCHEQUER   | D   | FIBA         | C   | FORTUNA      | D   |
| EGGLESTON    | B   | EMPEYVILLE | L   | EXETER      | C   | FIDALGO      | C   | FORTHINGATE  | C   |
| EGIAN        | C   | EMPIRE     | C   | FLLINE      | D   | FIDULETOWN   | C   | FORWARD      | C   |
| EICKS        | C   | EMRICK     | B   | EXRAY       | D   | FIDDYMENT    | C   | FOSMONE      | B   |
| EIFORT       | C   | ENCE       | B   | EXUM        | C   | FIELDING     | B   | FOSSUM       | B   |
| EKAH         | C   | ENCIFRRO   | D   | EYERECM     | D   | FIELDON      | B   | FOSTER       | B/C |
| EKALAKA      | B   | ENLINA     | B   | EYNE        | B   | FIELDSUM     | B   | FOSTORIA     | B   |
| ELAM         | A   | ENDERS     | C   |             |     | FIFE         | A   | FOUNTAIN     | D   |
| ELBERT       | D   | ENDICOTT   | H   | FABIUS      | B   | FIFER        | D   | FOURLOG      | D   |
| ELBURN       | B   | ENIT       | H   | FACVILLE    | B   | FILLMORE     | D   | FOURPILE     | B   |
| ELCO         | B   | ENFIELD    | B   | FAHEY       | B   | FINCATTLE    | C   | FOUR STAR    | B/C |
| ELD          | B   | ENGLE      | H   | FAIM        | C   | FINGAL       | C   | FOUTS        | B   |
| ELDER        | B   | ENGLESTIDE | B   | FAINES      | A   | FINLEY       | B   | FOX          | B   |
| ELDER HOLLOW | D   | ENGLEWOOD  | C   | FAIRBANKS   | B   | FIRESTEEL    | B   | FOXCREEK     | B   |
| ELDERON      | B   | ENGLUND    | D   | FAIRDALE    | B   | FINGRELL     | B   | FOXPCUNT     | C   |
| ELDON        | B   | ENNIS      | B   | FAIRFAK     | B   | FIMMAGE      | B   | FOXCL        | D   |
| ELDRADU      | C   | ENICHVILLE | B/D | FAIRFIELD   | B   | FIRL         | C   | FGXPARK      | B   |
| ELDRIDGE     | C   | ENILA      | B   | FAIRHAVEN   | B   | FIRTH        | B   | FOXTON       | C   |
| ELEPHANT     | D   | ENON       | C   | FAIRPCUNT   | D   | FISH CREEK   | B   | FRAILEY      | C   |
| ELFRDY       | B   | ENOS       | D   | FAIRPORT    | C   | FISHERS      | B   | FRAP         | B   |
| ELFRIDA      | B   | ENSBAURG   | D   | FAJARC      | C   | FISHPOK      | D   | FRANCIS      | A   |
| ELIJAH       | C   | ENSTGN     | D   | FALAYA      | C   | FISHKILL     | C   | FRANK        | D   |
| ELIOAK       | C   | ENSLEY     | C   | FALCON      | C   | FITCH        | A   | FRANKFORT    | D   |
| ELK          | H   | ENSTROM    | B   | FALFURRIAS  | A   | FITCVILLE    | C   | FRANKLIR     | C   |
| ELKADER      | B   | ENTERPRISE | B   | FALK        | B   | FITZGERALD   | B   | FRANKLIN     | B   |
| ELKCREEK     | C   | ENTIAI     | D   | FALKNER     | C   | FITZHUGH     | B   | FRANKTCWN    | B   |
| ELK HOLLOW   | B   | ENUMCLAW   | E   | FALL        | B   | FIVE OUT     | B   | FRANKTCWN    | D   |
| ELKHORN      | A   | EPHRAIM    | C   | FALLHROCK   | B   | FIVEPILE     | B   | FRANKVILLE   | D   |
| ELKINS       | D   | EPHRATA    | B   | FALLON      | C   | FIVES        | B   | FRATERNIDAD  | D   |
| ELKINSVILLE  | B   | EPHUFETTE  | C   | FALLSBURG   | C   | FLAGG        | B   | FRAZER       | C   |
| ELK MOUND    | C   | EPPING     | D   | FALLSINGTON | D   | FLAGSTAFF    | C   | FRED         | C   |
| ELK MOUNTAIN | B   | EPSIE      | C   | FANCHER     | C   | FLAK         | C   | FREDESBORG   | C   |
| ELKTON       | D   | ERA        | B   | FANG        | C   | FLAMING      | B   | FREDERICK    | B   |
| ELLABELLE    | B/D | ERAP       | C   | FANNIN      | B   | FLAMINGO     | D   | FREDON       | C   |
| ELLEBOE      | J   | ERBER      | C   | FANNC       | C   | FLANAGAN     | B   | FREDONIA     | C   |
| ELLEY        | D   | ERIC       | C   | FANU        | C   | FLANDREAU    | B   | FREDRICKSON  | C   |
| ELLETT       | D   | ERIE       | B   | FANACAY     | C   | FLASHEP      | A   | FREEBURG     | C   |
| ELLIEN       | A   | ERIN       | H   | FARALLCNE   | B   | FLATHEAD     | A   | FREECE       | D   |
| ELLICOTT     | A   | ERNEST     | C   | FARAHAY     | C   | FLAT HORN    | D   | FREEMOLD     | B   |
| ELLINGTON    | B   | ERAPUOSPE  | C   | FARCC       | D   | FLATTOP      | D   | FREEL        | B   |
| ELLINO       | B   | ESCAL      | B   | FARISTA     | B   | FLAXTON      | A   | FREEMAN      | C   |
| ELLISOTT     | C   | ESCALANTE  | B   | FARLANG     | B   | FLEAK        | A   | FREENANVILLE | B   |
| ELLIS        | C   | ESCAPRIA   | C   | FARPCUNTON  | C/D | FLECHADO     | C   | FREON        | B   |
| ELLISFORD    | D   | ESCONDIDO  | C   | FARNUF      | B   | FLEETWOOD    | B   | FREER        | C   |

NOTES: A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED  
TWO SOIL GROUPS SUCH AS B/D INDICATES THE DRAINED/UNDRAINED SITUATION

Table C-1--Continued

|               |     |             |     |              |     |              |     |              |     |
|---------------|-----|-------------|-----|--------------|-----|--------------|-----|--------------|-----|
| FREESTONE     | C   | GASCONADE   | D   | GLENFIELD    | D   | GRANGER      | C   | GURN         | B   |
| FREEZENER     | B   | GAS CREEK   | C   | GLENFORD     | C   | GRANGEVILLE  | B/C | GUNTER       | A   |
| FREMONT       | C   | GASKELL     | C   | GLENHALL     | B   | GRANILE      | B   | GURABO       | D   |
| FRENCH        | C   | GASS        | D   | GLENHAP      | B   | GRANC        | D   | GURNEY       | C   |
| FRENCHTOWN    | D   | GASSET      | D   | GLENMAMA     | C   | GRANT        | B   | GUSTAVUS     | C   |
| FRENEAU       | D   | GATESBURG   | A   | GLENNALLEN   | C   | GRANTSBURG   | C   | GUSTIN       | B   |
| FRESNO        | D   | GATEVIEW    | B   | GLENOMA      | B   | GRANTSUALE   | A   | GUTHRIE      | D   |
| FRIANA        | C   | GATENAY     | C   | GLENRCSE     | B   | GRANVILLE    | B   | GUYTON       | D   |
| FRIANT        | D   | GATEWOOD    | D   | GLENSTED     | D   | GRAPEVINE    | B   | GWIN         | D   |
| FRIDLO        | C   | GAULDY      | B   | GLENTON      | B   | GRASPEPE     | C   | GWINNETT     | B   |
| FRIEDMAN      | B   | GAVINS      | C   | GLENVIEW     | B   | GRASSNA      | B   | GYMER        | C   |
| FRIES         | D   | GAVIOTA     | D   | GLENVILLE    | C   | GRASSY BUTTE | A   |              |     |
| FRIO          | B   | GAY         | D   | GLIDE        | B   | GRATZ        | C   | HACCKE       | C   |
| FRIZZELL      | C   | GAYLORD     | B   | GLIKON       | B   | GRAVCEN      | C   | HACIENDA     | C   |
| FROBCRG       | D   | GAYNOR      | C   | GLCRIA       | C   | GRAVE        | B   | HACK         | B   |
| FROHMAN       | C   | GAYVILLE    | B   | GLCUC. ESTER | A   | GRAVITY      | C   | HACKERS      | B   |
| FROHOFER      | C   | GAZELLE     | D   | GLOVER       | C/D | GRAYCALM     | A   | HACKETTSTOWN | B   |
| FRONTON       | D   | GAZOS       | B   | GLYNOCN      | B   | GRAYFCRD     | B   | HADLEY       | B   |
| FROST         | D   | GEARNHART   | A   | GLYNN        | C   | GRAYLING     | A   | HADD         | B   |
| FRUITA        | B   | GEARY       | B   | GCOBLE       | C   | GRAYLOCK     | B   | HAGEN        | B   |
| FRUITLAND     | B   | GEE         | B   | GCCARD       | B   | GRAYPOINT    | B   | HAGENBARTH   | B   |
| FRYE          | D   | GEEBURG     | C   | GODDE        | D   | GRAYS        | B   | HAGENER      | A   |
| FUEGO         | C   | GEER        | A   | GODECKE      | D   | GREAT BEND   | B   | HAGER        | C   |
| FUERA         | C   | GEFO        | C   | GODFREY      | D   | GREELEY      | B   | HAGERMAN     | C   |
| FULDA         | C   | GELKIE      | B   | GODWIN       | D   | GREEN BLUFF  | B   | HAGERSTOWN   | C   |
| FULLEXTON     | B   | GEM         | C   | GOGLEIN      | C   | GREEN CANYON | B   | HAGGA        | C   |
| FULMER        | B/D | GEMID       | C   | GOGESSEL     | D   | GREENCREEK   | B   | HAIG         | C   |
| FULSHEAR      | C   | GEMSON      | C   | GOGFF        | C   | GREENDALE    | B   | HAIKU        | B   |
| FULTON        | D   | GENESSEE    | B   | GOGEBIC      | B   | GREENFIELD   | B   | HAILMAN      | B   |
| FUQUAY        | R   | GENEVA      | D   | GOLBIN       | C   | GREENHORN    | D   | HAINES       | B/C |
| FURNIS        | B/D | GENOA       | C   | GOLCCND.A    | D   | GREENLEAF    | B   | HAIRE        | C   |
| FURY          | B/D | GENOLA      | D   | GCLDENC.ALE  | B   | GREENCUGH    | C   | HALAWA       | C   |
|               |     | GEORGEVILLE | B   | GCLCFIELD    | B   | GREENPORT    | C   | HALCER       | C   |
| GAASTRA       | C   | GEORGIA     | B   | GCLLMILL     | B   | GREEN RIVER  | B   | HALE         | B   |
| GABALDON      | C   | GERALD      | D   | GCLLMAN      | C   | GREENSHORO   | C   | HALEIMA      | B   |
| GABICA        | D   | GERBER      | B   | GCLDRIDGE    | B   | GREENSON     | C   | HALEY        | B   |
| GACEY         | D   | GERIG       | D   | GCLDRUN      | A   | GREENTON     | C   | HALF MOON    | B   |
| GADDES        | C   | GERING      | B   | GOLDSDRIT    | C   | GREENVILLE   | B   | HALFORD      | A   |
| GADES         | G   | GERLAND     | C   | GOLDSTON     | C   | GREENWATER   | A   | HALFWAY      | D   |
| GADSDEN       | D   | GERMANIA    | D   | GULCSTRE.M   | D   | GREENWICH    | B   | HALII        | B   |
| GAGE          | C   | GERMANY     | B   | GCLCVALL     | C   | GREENWOOD    | C   | HALIHAILE    | B   |
| GAGEBY        | B   | GESTRIM     | B   | GCLDUVEIN    | C   | GREER        | C   | HALIS        | B   |
| GAGETOWN      | C   | GETTA       | C   | GCLLIAD      | C   | GREGORY      | A   | HALL         | B   |
| GAMEE         | B   | GETTYS      | C   | GCLLAHER     | A   | GRELL        | C   | HALLECK      | B   |
| GAINES        | C   | GEYSEN      | D   | GCLVICK      | B   | GRENADE      | C   | HALL RANCH   | C   |
| GAINESVILLE   | A   | GMENT       | C   | GCLVICK      | B   | GRENVILLE    | B   | HALLVILLE    | C   |
| GALATA        | D   | GIBBLER     | C   | GCLVICK      | D   | GRESHAM      | C   | HALSEY       | D   |
| GALE          | B   | GIBBEN      | B   | GCCCALE      | C   | GREWINGK     | C   | HAWAKUAPOKO  | B   |
| GALEN         | B   | GIBBS       | D   | GCCDING      | C   | GREYBACK     | B   | HAWAN        | B   |
| GALENA        | C   | GIBBSTOWN   | A   | GCCINGTON    | C   | GREYBULL     | C   | HAWAR        | B   |
| GALEPPI       | C   | GIFFIN      | C   | GCCDLOW      | B   | GREYCLIFF    | C   | HAWBLEN      | C   |
| GALESTOWN     | A   | GIFFORD     | C   | GGOEMAN      | B   | GRIFFY       | B   | HAWBRIGHT    | D   |
| GALEY         | B   | GILA        | C   | GCCCRICH     | B   | GRIGSTON     | B   | HAWBURG      | C   |
| GALISTED      | D   | GILBY       | B   | GCCDSPRINGS  | D   | GRIPSTAD     | B   | HAWEL        | B   |
| GALLAGHER     | B   | GILCHRIST   | B   | GOOSE CREEK  | B   | GRISWOLD     | B   | HAWERLY      | C   |
| GALLATIN      | A   | GILCREST    | B   | GOGSE LAKE   | C   | GRIWER       | C   | HAMILTON     | A   |
| GALLGOS       | B   | GILEAU      | C   | GCGSMUS      | B   | GRIZZLY      | C   | HAMLET       | B   |
| GALLINA       | C   | GILFS       | B   | GCRCO        | C   | GROGAN       | B   | HAMLIN       | B   |
| GALLION       | B   | GILFCRD     | B/D | GERE         | D   | GROSECLOSE   | C   | HAMPDEN      | C   |
| GALVA         | B   | GILMCULY    | B   | GCHGCNIC     | A   | GROSS        | C   | HAMPSHIRE    | C   |
| GALVESTON     | A   | GILLISPIE   | C   | GCRPAM       | B   | GRITON       | A   | HARPTON      | C   |
| GALVIN        | C   | GILLIAM     | C   | GCRPIN       | C   | GROVE        | A   | HARTAN       | C   |
| GAMBLER       | A   | GILLIGAN    | B   | GCRING       | C   | GROVELAND    | B   | HANA         | A   |
| GANNETT       | D   | GILLS       | C   | GCRPAN       | B   | GROVER       | B   | HANALET      | C   |
| GANSNER       | D   | GILMORE     | D   | GCRUS        | A   | GROVETLN     | B   | HANAPALU     | A   |
| GAPO          | D   | GILPIN      | C   | GCRZELL      | B   | GRUBBS       | D   | HANCEVILLE   | B   |
| GAPPNAYER     | B   | GILREY      | C   | GOSFEA       | B   | GRULLA       | D   | HAND         | B   |
| GARA          | B   | GILSON      | B   | GCSHUTE      | D   | GRUMMIT      | D   | HANDFCRD     | B   |
| GARBER        | R   | GILT EDGE   | C   | GCSPART      | C   | GRUNCI       | C   | HANEY        | B   |
| GARBUTT       | B   | GINAT       | D   | GCTHAM       | D   | CRUVER       | C   | HANGAARD     | B   |
| GARCENO       | C   | GINGER      | C   | GCTHARD      | D   | GRYGLA       | C   | HANGER       | B   |
| GARUENA       | B   | GINI        | B   | GCTHIC       | C   | GUADALUPE    | B   | HANIPOE      | B   |
| GARDNER       | A   | GINSER      | C   | GOTHC        | C   | CUAJE        | A   | HANKINS      | C   |
| GARDNERS FORK | B   | GIRD        | A   | GCLLDING     | D   | GUALALA      | D   | HANKS        | B   |
| GARDNERVILLE  | D   | GIVEN       | C   | GCVAN        | C   | GUAMANI      | B   | HANLY        | A   |
| GARLONE       | A   | GLADGEN     | A   | GOVE         | B   | GUANAJIBO    | C   | HANNA        | B   |
| GAREY         | C   | GLADSTONE   | B   | GCLWEN       | B   | GUANICA      | D   | HANOVER      | C   |
| GAHFIELD      | C   | GLADWIN     | A   | GRAPE        | B   | GUAYAGO      | B   | HANS         | C   |
| GARITA        | C   | GLAMIS      | C   | GRABLE       | B   | GUAYABOTA    | D   | HANSEL       | C   |
| GARLAND       | R   | GLANN       | B/C | GRACEMONT    | B   | GUAYAMA      | B   | HANSKA       | C   |
| GARLET        | A   | GLASGOW     | C   | GRACEVILLE   | B   | GUBEN        | D   | HANSON       | A   |
| GARLCK        | C   | GLEAN       | H   | GRACY        | D   | GUCKEEN      | C   | HANTHO       | B   |
| GARMUN        | C   | GLEASON     | C   | GRAFTON      | B   | GUELPH       | B   | HANTZ        | D   |
| GARMORE       | R   | GLEN        | B   | GRAHAM       | D   | GUENCC       | C   | HAP          | B   |
| GARNER        | D   | GLENBERG    | B   | GRAIL        | C   | GULRNSEY     | C   | HAPGOOD      | B   |
| GARG          | D   | GLENBROOK   | D   | GRAMM        | B   | GUERRERC     | C   | HAPNEY       | C   |
| GARK          | D   | GLENCOE     | D   | GRANATH      | B   | GUEST        | U   | HARBORD      | B   |
| GARRARD       | B   | GLENDALE    | H   | GRANBY       | A/D | GULIN        | A   | HARBOURTON   | B   |
| GARRFTSON     | B   | GLENDALE    | B   | GRANDE RONDE | D   | GULER        | B   | HARCO        | B   |
| GARRETT       | B   | GLENDIVE    | B   | GRANDFIELD   | B   | GULKANA      | B   | HARCEMAN     | B   |
| GARRISON      | B   | GLENDORA    | C   | GRANVIEW     | C   | GUMBOT       | C   | HARDESTY     | B   |
| GARNIN        | C   | GLENELG     | B   | GRANER       | C   | GUNBARHEL    | A   | HANGLING     | D   |

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table C-1 --Continued

|              |     |              |     |                 |     |                 |     |               |     |
|--------------|-----|--------------|-----|-----------------|-----|-----------------|-----|---------------|-----|
| HARDSCRABBLE | B   | HEBER        | B   | MILCRETH        | D   | MONEYGROVE      | C   | HUMBARGER     | B   |
| HARDY        | D   | HEBERT       | C   | MILEA           | D   | MONEYVILLE      | C   | HUMBIRD       | C   |
| HARGREAVE    | A   | HEBGEN       | A   | MILES           | B   | MCNN            | B   | HUMBOLOT      | C   |
| HARKENS      | C   | HEPD         | D   | MILGER          | B   | MONEKAA         | A   | MUMDUN        | B   |
| HARKEY       | B   | HEBKON       | C   | MILGRAVE        | B   | MCNCLUA         | B   | MUPE          | C   |
| HAPLAN       | B   | HECHT        | B   | MILLEMANN       | C   | MONCMANU        | B   | MUMESTON      | C   |
| HAPLEM       | C   | HECKI        | C   | MILLET          | D   | MONGULIULI      | D   | MUMPTON       | C   |
| HARLESTON    | C   | MECLA        | B   | MILLFIELD       | B   | MONUAULU        | A   | MUMPHREYS     | B   |
| HARLINGEN    | D   | HECTOR       | D   | MILLGATE        | C   | MOOD            | B   | MUMPTULIPS    | B   |
| HARMEHL      | C   | HEDDGN       | C   | MILLIARD        | B   | MOODLE          | B   | MUNSAKER      | B   |
| HARMONY      | C   | HEORICK      | B   | MILLCN          | B   | MOODSPORT       | B   | MUNTERS       | B   |
| HARNEY       | C   | HEOVILLE     | D   | MILLSBRO        | B   | MOODVIEW        | B   | MUNTING       | C   |
| HARPEETH     | A   | HEGNE        | D   | MILLSSCALE      | B   | MOOKTGN         | C   | MUNTINGTON    | B   |
| HARPS        | B   | HEIDEN       | D   | MILPAR          | C/D | MOOLEHUA        | B   | MUNTSVILLE    | B   |
| HARPSTER     | C   | HEIDTMAN     | C   | MILC            | A   | MOCPAL          | C   | MUPP          | B   |
| HARPT        | B   | HEIL         | D   | MILT            | B   | MOCPEP          | D   | MURLEY        | D   |
| HARQUA       | B   | HEIMDAL      | B   | MILTCH          | B   | MOCPESTON       | B   | MURCH         | C   |
| HARQUA       | B   | HEISETON     | B   | MIRACLE         | A   | MOCSCIC         | A   | MURST         | C   |
| HARRIET      | D   | HEISLER      | B   | MIRADES         | C   | MOCT            | D   | MURNAL        | B   |
| HARRIMAN     | B   | HEIST        | B   | MINESBURG       | C   | MOLTEN          | D   | MUSSE         | C   |
| HARRIS       | D   | HEITT        | C   | MIRKLE          | D   | MOCVER          | B   | MUSSA         | B/D |
| HARRISBURG   | D   | HEITZ        | D   | MIRMAN          | C   | MOPETCN         | C   | MUSSMAN       | D   |
| HARRISON     | C   | HEIZER       | D   | MIRSCALE        | C   | MOPWELL         | C   | MUTCHINSON    | C   |
| HARRISVILLE  | C   | HELD         | C   | MINTZE          | D   | MOPGCCD         | C   | MUTSON        | B   |
| HARSTENE     | B   | HELEMANO     | C   | MISLE           | D   | MOPKINS         | B   | MUXLEY        | D   |
| HART         | D   | HELENA       | C   | HITT            | B   | MOPLEY          | B   | NYAP          | D   |
| HART CAMP    | C   | HELMER       | C   | HI VISTA        | C   | MOCPEP          | B   | NYAT          | A   |
| HARTFORD     | A   | HELVETIA     | C   | MIVASSEE        | B   | MOQUIAM         | B   | HYATTVILLE    | B   |
| HARTIG       | B   | HELY         | B   | MIVCOD          | A   | MORATIO         | D   | HYOABURG      | D   |
| HARTLAND     | B   | HEMBRE       | B   | MIXTCN          | B   | MCRD            | B   | HYDE          | D   |
| HARTLETON    | B   | HEMMI        | C   | MIBACKER        | B   | MCREB           | B   | HYDRO         | C   |
| HARTLINE     | B   | HEMPFIELD    | B   | MIBAN           | C   | MCRNELL         | D   | HYNAS         | D   |
| HAPTSBURG    | B   | HEPPSTEAD    | C   | MIBBS           | B   | MORNING         | A   | HYRUM         | B   |
| HARTSELLS    | B   | HECRATT      | B   | MIBSEN          | C   | MORNITOS        | D   | HYSHAM        | D   |
| HARTSHORN    | B   | HENDERSON    | B   | MIBHEIP         | B   | MORROCKS        | B   |               |     |
| HARVARD      | B   | HENDRICKS    | H   | MIBCKING        | B   | MORFSHOE        | B   | IAO           | C   |
| HARVEL       | B   | HENEFER      | C   | MIBCKINSON      | C   | MORTCN          | B   | IBERIA        | C   |
| HARVEY       | C   | HENKIA       | B   | MIBCKLEY        | C   | MORTCNVILLE     | B   | ICENE         | C   |
| HASKILL      | A   | HENLEY       | C   | MIBGGE          | B   | MOSKIN          | C   | IDA           | B   |
| HASKINS      | C   | HENLINE      | C   | MIBGINS         | C   | MOSLEY          | D   | IDABEL        | B   |
| HASSELL      | D   | HENNEKE      | C   | MIBGSON         | C   | MOSMER          | C   | IDANA         | C   |
| HASTINGS     | B   | HENNEPIN     | B   | MIBEBE          | B   | MOTAW           | C   | IDECN         | D   |
| HAT          | B   | HENNINGSEN   | C   | MIBELZLE        | C   | MOT LAKE        | C   | IDRCH         | B   |
| HATBORO      | D   | HENRY        | D   | MIBFFMAN        | C   | MOCUDEK         | B   | IGNACIO       | B   |
| HATCH        | C   | HENSEL       | B   | MIBFFMANVILLE   | C   | MOCUGHTON       | A/D | IGC           | D   |
| HATCHEMY     | C   | HENSHAW      | C   | MIBGANSBURG     | B   | MOK             | C   | IGUALOAD      | D   |
| HATFIELD     | C   | HENSLEY      | D   | MIBCELAND       | B   | MOLKA           | C   | IHMEN         | D   |
| HATHAWAY     | B   | HEPLER       | D   | MIBGG           | D   | MOLTCN          | C/D | IJAP          | D   |
| HATTIE       | C   | HEBERT       | B   | MIBGRIS         | B   | MOUNDBY         | D   | ILDEFENSO     | B   |
| HATTON       | C   | HEHEFORD     | B   | MIBM            | B   | MOURGLASS       | B   | ILKA          | B   |
| HAUBSTADT    | C   | HEKIMER      | B   | MIBGMANN        | C   | MOCUSATONIC     | D   | ILLION        | B/D |
| HAVANA       | B   | HEKENG       | D   | MIBKC           | C   | MOCUSE MCUNTAIN | D   | IMA           | B   |
| HAVEN        | B   | HEMISTON     | B   | MIBLBROCK       | B   | MOCUSEVILLE     | C   | IMBLER        | B   |
| HAVERLY      | B   | HEMCON       | A   | MIBLCOMB        | D   | MOCUSTON        | D   | IMLAY         | C   |
| HAVERSON     | B   | HEMDOON      | B   | MIBLDANAY       | D   | MOCUSTON BLACK  | C   | IMCKALEE      | B/D |
| HAVILLAM     | H   | HEMO         | B   | MIBLDEN         | A   | MOCUDE          | A/C | IMPERIAL      | C   |
| HAVINGDOON   | C   | HEPRERA      | A   | MIBLCERNESSE    | C   | MOCVEN          | D   | INAYALE       | A   |
| HAVRE        | C   | HEFRICK      | C   | MIBLCEREGE      | B   | MOCVENWEEP      | C   | INDIANHOA     | C   |
| HAVRELDN     | B   | HEPRCN       | B   | MIBLLAND        | B   | MOCVERT         | D   | INDIAN        | D   |
| HAW          | B   | HERSH        | A   | MIBLLINACER     | B   | MOCVEY          | C   | INDIAN CREEK  | D   |
| HAWES        | A   | HESSHAL      | B/D | MIBLLIS         | C/D | MOCWARD         | B   | INDIANC       | C   |
| HAWI         | B   | HESSH        | R   | MIBLLISTER      | D   | MOCWELL         | C   | INDIANCLA     | A   |
| HAWKEYE      | A   | HESPER       | C   | MIBLLMAN        | C   | MOCWLAND        | C   | INDIO         | B   |
| HAWKSELL     | A   | HESPERIA     | B   | MIBLLLOWAY      | A   | MOCYE           | B   | INGA          | B   |
| HAWKSPRINGS  | B   | HESPERUS     | B   | MIBLLLY         | D   | MOCYLETON       | C   | INGALLS       | B   |
| HAYTON       | A   | HESE         | C   | MIBLLLY SPRINGS | D   | MOCYPUS         | A   | INGARD        | B   |
| HAYBOURNE    | B   | HESEL        | C   | MIBLLLYWCCD     | D   | MOCYVILLE       | D   | INGENIO       | C   |
| HAYKID       | C   | HESELBERG    | C   | MIBLLMDEL       | C   | MOCUBBARD       | A   | INGRAM        | D   |
| HAYDEN       | B   | HESELTIME    | B   | MIBLLPES        | B   | MOCUBER         | D   | INKLER        | B   |
| HAYESTON     | B   | HESSCN       | C   | MIBLLCPUA       | B   | MOCUBERT        | B   | INKS          | D   |
| HAYESVILLE   | B   | HETINGER     | D   | MIBLLCPAW       | B/D | MOCUBLENSBURG   | C   | INMAN         | C   |
| HAYFIELD     | P   | HEXT         | B   | MIBLLRCYD       | B   | MOCUCKLEBERKY   | C   | INPC          | A   |
| HAYFORD      | C   | HEZEL        | B   | MIBLLSINE       | B   | MOCUDSON        | C   | INSKIP        | C   |
| HAYMOND      | B   | HEALEAM      | D   | MIBLLST         | B   | MOCUEGG         | C   | INVERNESS     | D   |
| HAYNESS      | D   | HEAWATHA     | A   | MIBLLSTCN       | B   | MOCUEL          | A   | INWCCD        | C   |
| HAYNIF       | B   | HEBBARD      | C   | MIBLLT          | B   | MOCUENEMF       | B/C | IO            | B   |
| HAYPRESS     | A   | HEBING       | C   | MIBLLTLE        | B   | MOCUENEMF       | D   | IOLA          | A   |
| HAYSPUR      | B/D | HICKORY      | C   | MIBLLTVILLE     | C   | MOCUEY          | D   | IOLAU         | C   |
| HAYTER       | B   | HICKS        | B   | MIBLLYCKE       | C/D | MOCUFFINE       | A   | IONA          | B   |
| HAYTI        | D   | HIDALGO      | B   | MOCOPA          | C   | MOCUGGINS       | C   | IONIA         | B   |
| HAYWOOD      | B   | HIDEAWAY     | D   | MOCPE CAMP      | C   | MOCUGNES        | C   | ICSCC         | B   |
| HAZEL        | C   | HIDEWOOD     | C   | MOCPELAKE       | B   | MOCUGNESVILLE   | B   | IPAVA         | B   |
| HAZELAIR     | D   | HIGHAMS      | D   | MOCPEP          | C   | MOCUGC          | B   | IRA           | C   |
| HAZEN        | B   | HIGHFIELD    | B   | MOCPESTAKE      | D   | MOCUICICA       | C   | IREDELL       | D   |
| HAZLEHURST   | C   | HIGH GAP     | C   | MOCPESTEAD      | B   | MOCUKAU         | A   | IRETEBA       | C   |
| HAZLETON     | B   | HIGHLAND     | B   | MOCPEAUNAU      | C   | MOCULETT        | B   | IRIP          | C   |
| HEADLEY      | B   | HIGHMORE     | A   | MOCPCLT         | B   | MOCULLS         | C   | IRCCK         | B   |
| HEADQUARTERS | B   | HIGH PARK    | B   | MOCPCALE        | D   | MOCULLT         | B   | IRCN BLCSOM   | D   |
| HEAKE        | D   | HIMIMANU     | A   | MOCPCND         | C   | MOCULLUA        | D   | IRCN MCUNTAIN | D   |
| HEATH        | C   | HIBNER       | C   | MOCPCCHC        | B   | MOCUM           | B   | IRCN RIVER    | B   |
| HEATLY       | A   | HIKO PEAK    | B   | MOCPCCYE        | B   | MOCUMACAD       | B   | IRNONTCN      | C   |
| HEBRONVILLE  | J   | HIKO SPRINGS | C   | MOCPCAY         | D   | MOCUMATAS       | C   | IRVINGTON     | C   |

NOTES: A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED. THE SOIL GROUPS SUCH AS B/D INDICATES THE DRAINER/UNDRAINER SITUATION.

Table C-1--Continued

|              |     |            |     |               |   |               |     |             |     |
|--------------|-----|------------|-----|---------------|---|---------------|-----|-------------|-----|
| IRWIN        | D   | JONUS      | B   | KARLG         | D | KEMMIT        | A   | KITSAP      | C   |
| ISAAC        | C   | JOPLIN     | B   | KARLUK        | C | KERA          | B   | KITTANNING  | B   |
| ISAAQUAH     | B/C | JOPPA      | B   | KARNAK        | D | KERRICK       | B   | KITTITAS    | B   |
| ISABELL      | C   | JORDAN     | D   | KARNES        | B | KERRICMN      | B   | KITTREDGE   | C   |
| ISAM         | D   | JORNADO    | B   | KARRO         | B | KERSMAN       | A   | KITTSOM     | C   |
| ISANTI       | D   | JORY       | C   | KARS          | A | KERSICK       | D   | KIUP        | B   |
| ISHAM        | C   | JOSE       | C   | KARTA         | C | KERSTON       | A/D | KIVA        | B   |
| ISHI PTSHI   | C   | JOSEPHINE  | B   | KARTAR        | B | KERT          | C   | KIMANIS     | A   |
| ISLAND       | B   | JOSTE      | B   | KASHWI NA     | B | KERWIN        | C   | KIZMAYAK    | B   |
| ISON         | B   | JOY        | B   | KASILC        | A | RESSLER       | C   | KJAR        | D   |
| ISTOKPCCA    | D   | JUBILEE    | C   | KASKI         | B | KESWICK       | D   | KLABER      | C   |
| ITSHOOT      | B   | JUDD       | D   | KASCTA        | C | KETCHLY       | B   | KLAMATH     | B/D |
| IUKA         | C   | JUDITH     | B   | KASSL A       | A | KETTLE        | B   | KLAUS       | A   |
| IVA          | C   | JUDKINS    | C   | KASSC         | C | KETTLEMAN     | B   | KLANASI     | C   |
| IVAN         | B   | JUDSON     | B   | KATAM         | B | KETTNER       | C   | KLEJ        | B   |
| IVES         | B   | JUDY       | C   | KATE'CY       | C | KELVIN        | C   | KLICKEK     | C   |
| IVIE         | A   | JUGET      | D   | KATC          | C | KL=ALNIF      | C   | KLICKITAT   | C   |
| IVINS        | C   | JUGHANDLE  | ?   | KATMNE        | B | KENFENAW      | A   | KLINE       | B   |
| IZAGURA      | C   | JULES      | B   | KATAA         | B | KEYA          | B   | KLINESVILLE | C/D |
| IZEE         | C   | JULESBURG  | A   | KATY          | C | KEYES         | D   | KLINGER     | B   |
|              |     | JULIAETTA  | B   | KAUPAN        | D | KEYPORT       | C   | KLGNOIKE    | D   |
| JABU         | C   | JUMPE      | B   | KAUPC         | A | KEYTESVILLE   | D   | KLONE       | B   |
| JACAGUAS     | B   | JUNCAL     | C   | KAV:TT        | D | KEZAR         | B   | KLOOCHMAN   | B   |
| JACANA       | D   | JUNCOS     | D   | KAW:IMAE      | C | KIAMAH        | C   | KLOTEN      | B   |
| JACINTO      | B   | JUACTION   | B   | KAWAIMAPAI    | B | KIBBIE        | B   | KLUTINA     | B   |
| JACK CREEK   | B   | JUNEAU     | B   | KAWBANGAM     | C | KICKERVILLE   | B   | KNAPPA      | B   |
| JACKLIN      | B   | JUNIATA    | B   | KAWIIM        | A | KIDD          | C   | KNEELAND    | C   |
| JACKNIFE     | C   | JUNIUS     | C   | KAWKAWLIN     | C | KIDMAN        | B   | KNIFFIN     | C   |
| JACKS        | D   | JUNO       | B   | KEAL          | D | KIEHL         | A   | KNIGHT      | C   |
| JACKSON      | B   | JUNQUITOS  | C   | KEAPLA        | B | KIEV          | B   | KNIK        | B   |
| JACKSONVILLE | C   | JURA       | C   | KEALAEKUA     | C | KIKONI        | B   | KNIPPA      | D   |
| JACOB        | D   | JUVA       | B   | KEALIL        | D | KILARC        | D   | KNOB HILL   | B   |
| JACOBSEN     | D   | JUVAN      | D   | KEANSB:RG     | D | KILAUEA       | B   | KNCLES      | B   |
| JACOAY       | C   |            |     | KEARAS        | B | KILBOUANE     | A   | KNOD        | B   |
| JACOUES      | C   | KAALUALU   | A   | KEATING       | C | KILBURN       | A   | KNULL       | B   |
| JACQUITH     | C   | KACHENAK   | B   | KEAUKAFA      | D | KILCHIS       | C   | KNUTSEN     | A   |
| JACWIN       | B   | KADASHAN   | B   | KEAWAKA?U     | B | KILDOR        | C   | KOBAR       | C   |
| JAFFREY      | A   | KADE       | B   | KEBLER        | B | KILGORE       | B/D | KOCA        | C   |
| JAGUEYES     | B   | KAUGKA     | B   | KECH          | C | KILKENNY      | B   | KODAK       | C   |
| JAL          | B   | KAUCKA     | D   | KECKO         | B | KILLBUCK      | C/D | KOOTAK      | B   |
| JAMES CANYON | B/C | KAENA      | D   | KECRCN        | C | KILLEY        | B   | KOEFLEK     | C   |
| JAMES TOWN   | C   | KAHALUU    | D   | KEEFERS       | C | KILLINGWORTH  | C   | KOELE       | B   |
| JANE         | C   | KAHANA     | B   | KEEGAN        | B | KILLPACK      | C   | KOEPKE      | B   |
| JANISE       | C   | KAHANUI    | B   | KEEI          | D | KILMERQUE     | C   | KOERLING    | B   |
| JANSEN       | A   | KAHLEH     | B   | KEEKEE        | B | KILCA         | A   | KOGISH      | D   |
| JANOE        | C   | KAHOLA     | B   | KEENE         | C | KILLHANA      | A   | KOHALA      | A   |
| JAKITA       | C   | KAH SHEETS | D   | KEENC         | C | KILWINNING    | C   | KOKEE       | B   |
| JARRE        | B   | KAHUA      | D   | KEG           | B | KIM           | B   | KOKC        | B   |
| JARVIS       | B   | KAIKLI     | D   | KEFENA        | C | KIMAMA        | B   | KOKKAMI     | D   |
| JASPER       | A   | KAILUA     | A   | KEIGLEY       | C | KIMBALL       | C   | KOKOMO      | B/D |
| JAUCA5       | A   | KAIMU      | A   | KEISER        | B | KIMBERLY      | B   | KOLBERG     | B   |
| JAVA         | B   | KAINALIU   | A   | KEITH         | B | KIMBRUGH      | C   | KOLEKGLE    | C   |
| JAY          | C   | KAIPIOI    | B   | KEKANA        | B | KIMMERLING    | C   | KOLLS       | D   |
| JAYEM        | B   | KAIWIKI    | A   | KEKAKE        | D | KIMO          | C   | KOLCA       | C   |
| JAYSON       | D   | KALAE      | B   | KELLER        | C | KINA          | D   | KOLCKOLC    | B   |
| JEAN         | A   | KALAPA     | C   | KELLY         | D | KINCC         | A   | KONA        | D   |
| JEANETTE     | D   | KALAPAZOO  | B   | KELN          | C | KINGFISHER    | B   | KONAMA      | B   |
| JEAN LAKE    | B   | KALAPA     | B   | KELSEY        | C | KINGHURST     | B   | KONNER      | C   |
| JEDDO        | U   | KALAPAPA   | D   | KELSC         | C | KINGMAN       | B   | KONGKI      | C   |
| JEFFERSON    | B   | KALIFONSKY | C   | KELTAER       | B | KINGS         | C/D | KOCLAU      | C   |
| JEKLFY       | U   | KALIMI     | D   | KELVIN        | C | KINGSBOURY    | D   | KOGSKIA     | C   |
| JELM         | U   | KALISPELL  | A   | KEMCC         | B | KINGSLEY      | B   | KOOTENAI    | A   |
| JFNKINS      | B   | KALKASKA   | A   | KEMPSVILLE    | B | KINGS RIVER   | C   | KOPIAH      | C   |
| JFNKINSON    | D   | KALPIA     | R   | KEMPTCN       | B | KINGSTON      | B   | KOPP        | B   |
| JENNESS      | B   | KALOKO     | C   | KENAI         | C | KINGSVILLE    | C   | KOPPE5      | B   |
| JENNINGS     | C   | KALOLOCH   | E   | KENASVILLE    | A | KINKEAD       | D   | KORCMEA     | B   |
| JENNY        | D   | KALSIN     | C   | KENCAIA       | C | KINKEL        | B   | KORNMAN     | B   |
| JENALLO      | D   | KAPACK     | B   | KENDALL       | B | KINKRA        | D   | KOSPOS      | C   |
| JENICHO      | C   | KAMAKUA    | A   | KENCALLYVILLE | B | KINMAN        | C   | KOSSE       | D   |
| JEROME       | B   | KAMAOA     | B   | KENESAN       | B | KINNEY        | B   | KOSTER      | C   |
| JERNY        | C   | KAMACLE    | B   | KEAPOOR       | B | KINNICK       | C   | KOSZTA      | B   |
| JESSEL       | D   | KAMRAR     | B   | KERNALLY      | B | KINHEAD       | D   | KOUTS       | B   |
| JESSE CAMP   | C   | KANABEC    | B   | KEANAR        | B | KINROSS       | D   | KOVICH      | C   |
| JESSUP       | C   | KAKAKA     | B   | KEANEBC       | B | KINSTCN       | C   | KOYEN       | B   |
| JETT         | B   | KANAPAMA   | A/D | KENNEDY       | B | KINTON        | C   | KOYUKUK     | B   |
| JIGGS        | C   | KANDIK     | B   | KEENEWICK     | B | KINZEL        | B   | KRACE       | B   |
| JIM          | C   | KANE       | B   | KENNEY        | A | KIGNA         | B   | KRAAZBURG   | B   |
| JIMENEZ      | C   | KANEOME    | B   | KENNEY LAKE   | C | KIPLING       | D   | KRATKA      | C   |
| JIMTOWN      | C   | KANEPUU    | B   | KEAC          | D | KIPP          | C   | KRAUSE      | A   |
| JJU          | C   | KANLEE     | B   | KENCHA        | D | KIPPEN        | B   | KREAPER     | B   |
| JJPCS        | C   | KANGSH     | C   | KENSAL        | B | KIPSON        | C   | KREPLIN     | B   |
| JJCITY       | B   | KANZA      | C   | KENSPUR       | A | KIRK          | B/D | KRENTZ      | B   |
| JJEL         | B   | KAPAA      | A   | KENT          | D | KIRKHAM       | D   | KRESSON     | C   |
| JJES         | B   | KAPAPALA   | B   | KENYON        | C | KIRKLAND      | C   | KRUP        | D   |
| JJHNS        | C   | KAPCD      | B   | KEC           | B | KIRKTON       | B   | KRUZE       | B   |
| JJHNSBURG    | D   | KAPGWSIN   | B   | KECLDAR       | B | KIRTLEY       | B   | KRUZOF      | B   |
| JJHNSON      | B   | KAPUKIKANI | C   | KECPAP        | C | KIRVIN        | C   | KUBL        | B   |
| JJHNSON      | B/D | KAPAPIN    | B   | KECTA         | C | KISRIAG       | D   | KUBLER      | C   |
| JJHNSWIND    | B   | KAKOE      | C   | KECNAS        | D | KISSICK       | D   | KUBLI       | C   |
| JJICE        | D   | KARHEEN    | C   | KEPLER        | C | KISTLER       | C/D | KUCERA      | B   |
| JJILIT       | C   | KARLAN     | C   | KERBY         | B | KITCHELL      | B   | KUCK        | C   |
| JJINFSVILLE  | A   | KARLIN     | A   | KERPEL        | B | KITCHEN CREEK | B   | KUHL        | D   |

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED  
TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table C-1--Continued

|              |     |               |     |              |     |             |     |             |     |
|--------------|-----|---------------|-----|--------------|-----|-------------|-----|-------------|-----|
| KUKIAU       | A   | LANE          | C   | LEACVILLE    | B   | LICKCALE    | D   | LOLAK       | D   |
| KULA         | B   | LANEY         | B   | LEAF         | D   | LICKING     | C   | LOLALITA    | B   |
| KULAKALA     | B/C | LANG          | B/D | LEAMY        | B   | LICKSKILLET | D   | LOLERAA     | B   |
| KULLIT       | B   | LANGFORD      | C   | LEAL         | B   | LIDDELL     | D   | LOLETA      | C/D |
| KUMA         | B   | LANGHEI       | B   | LEAPS        | C   | LIEBERMAN   | C   | LOLC        | A   |
| KUNIA        | B   | LANGLEY       | C   | LEATHAM      | C   | LIEN        | D   | LOLCN       | A   |
| KUNUEIA      | C   | LANGLOIS      | D   | LEAVENWGRTH  | B   | LIGGET      | B   | LOMA        | C   |
| KURO         | D   | LANGLA        | B   | LEAVITT      | B   | LIGHTNING   | D   | LOMALTA     | D   |
| KUSKOKWIM    | D   | LANGRELL      | B   | LEAVITTVILLE | B   | LIGNUM      | C   | LOMAX       | B   |
| KUSLINA      | D   | LANGSTON      | C   | LEBANCN      | C   | LIGON       | D   | LOMIRA      | B   |
| KUTCH        | D   | LANTIER       | B   | LEBAR        | B   | LINEN       | A   | LONOC       | C   |
| KUTZTOWN     | B   | LANTIGER      | B   | LEBEC        | B   | LIHUE       | B   | LONEPINE    | C   |
| KVICHAK      | B   | LANKBUSH      | B   | LEBO         | C   | LIKES       | A   | LONERIDGE   | B   |
| KYLE         | D   | LANNIN        | C   | LEBSACK      | C   | LILAM       | A   | LONE ROCK   | A   |
| KYLER        | D   | LAANKTREE     | C   | LECK KILL    | B   | LILLIWAUP   | A   | LONETREE    | B   |
| LA BARGE     | B   | LANDAK        | B   | LEDBEDER     | A   | LIMA        | B   | LONGFORD    | C   |
| LABETTE      | D   | LANSOALF      | B   | LEDGEFORK    | C   | LIMANI      | B   | LONGLOIS    | B   |
| LABISH       | C   | LANSOOWNE     | B   | LEDDER       | C   | LIMBAR      | B   | LONGHARE    | B   |
| LA BOUNTY    | C   | LANSING       | B   | LEDRU        | D   | LIMERICK    | C   | LONGMONT    | C   |
| LA BRIER     | C   | LANTIS        | B   | LECY         | C   | LIMON       | C   | LONGRIE     | C   |
| LA CAMAS     | C/D | LANTON        | C   | LEE          | D   | LINDAES     | B   | LONGVAL     | B   |
| LA CASA      | C   | LANTONIA      | B   | LEEDS        | C   | LINCCLN     | A   | LONG VALLEY | B   |
| LA CITA      | C   | LANTZ         | C   | LEEFIELD     | C   | LINCRCFT    | A   | LONGVIEW    | C   |
| LA CRAWANNA  | C   | LAP           | D   | LEELANAU     | A   | LINDLFY     | C   | LOCKE       | B   |
| LA CONA      | C   | LAPALMA       | C   | LEEPER       | D   | LINDSLEY    | D   | LOMTI       | C   |
| LA COTA      | D   | LAPEER        | B   | LEESVILLE    | B/C | LINGSIDE    | C   | LOOKOUT     | C   |
| LACY         | D   | LAPINE        | A   | LEETCN       | C   | LINDSTROM   | B   | LOON        | B   |
| LADD         | B   | LAPLATTA      | C   | LEETCNIA     | C   | LINDY       | C   | LOPER       | B   |
| LAUDER       | D   | LAPORTE       | C   | LEFCR        | B   | LINEVILLE   | C   | LOPEZ       | D   |
| LADELLE      | B   | LA PCSTIA     | A   | LEGLEK       | B   | LINGANORE   | B   | LORADALE    | C   |
| LADOGA       | C   | LA PRAIRIE    | B   | LEGGRE       | B   | LINKER      | B   | LORAIN      | C/D |
| LADUE        | C   | LARABEE       | B   | LEHEN        | C   | LINKVILLE   | B   | LOROSTOWN   | C   |
| LADYSMITH    | D   | LARCHMOUNT    | B   | LEHIGH       | C   | LINNE       | C   | LORELLA     | D   |
| LA FARGE     | B   | LARDELL       | C   | LEHMANS      | D   | LINNET      | D   | LORENZO     | A   |
| LAFE         | D   | LAREDD        | B   | LEHR         | B   | LINNEUS     | B   | LORETTO     | B   |
| LA FONDA     | C   | LARES         | C   | LEICESTER    | C   | LINO        | D   | LORING      | C   |
| LAFONT       | B   | LARGENT       | D   | LEILEHUA     | B   | LINSLAN     | C   | LOS ALAMOS  | C   |
| LAGLORIA     | B   | LARGC         | C   | LELA         | D   | LINT        | B   | LOS BANOS   | C   |
| LAGONDA      | C   | LARIMER       | B   | LELAND       | D   | LINTCA      | B   | LOSEE       | B   |
| LA GRANDE    | C   | LARKIN        | B   | LEMETA       | D   | LINVILLE    | B   | LOS GATOS   | B   |
| LAMAINA      | B   | LARKSON       | C   | LEMPSTER     | C/D | LINWOOD     | A/D | LOS GUINEOS | C   |
| LA HOGUE     | B   | LA ROSE       | B   | LEN          | C   | LIPAN       | D   | LOS OSOS    | C   |
| LAMONTAN     | D   | LARRY         | D   | LENA         | A   | LIPPINCOTT  | B/D | LOS ROBLES  | B   |
| LATDIG       | C   | LARSON        | D   | LENAPAH      | D   | LIRICS      | B   | LOS TANOS   | B   |
| LATDLAW      | B   | LARUE         | A   | LENAWEE      | B/D | LIRRET      | B   | LOST CREEK  | B   |
| LAIROSVILLE  | D   | LARVIE        | D   | LENNEP       | D   | LISADE      | B   | LOST HILLS  | C   |
| LAIREP       | O   | LAS           | C   | LENCIR       | D   | LISAP       | B   | LOS TRANCOS | D   |
| LA JARA      | C   | LAS ANIMAS    | C   | LENCX        | B   | LISBCH      | B   | LOSTMELLS   | B   |
| LAKE         | A   | LASAUSSSES    | C   | LENZ         | B   | LISMAS      | D   | LOTHAIR     | C   |
| LAKE CHARLES | D   | LAS FLORES    | D   | LEC          | B   | LISMCRE     | B   | LOTUS       | B   |
| LAKE CREEK   | B   | LASHLEY       | D   | LEON         | A/D | LITCHFIELD  | A   | LOUDON      | C   |
| LAKEHELEN    | B   | LASIL         | D   | LEONARD      | C   | LITHGOW     | C   | LOUGNVILLE  | C   |
| LAKEHURST    | A   | LAS LUCAS     | C   | LECAARDO     | B   | LITHIA      | C   | LOUIE       | C   |
| LAKE JANEE   | A   | LAS POSAS     | C   | LECAARDTCMN  | D   | LITIMBER    | C   | LOUISA      | B   |
| LAKELAND     | A   | LASSEN        | D   | LECHIDAS     | B   | LITTLE      | D   | LOUISBURG   | B   |
| LAKEMONT     | D   | LASTANCE      | B   | LECTA        | C   | LITTLEWEAR  | A   | LOUP        | D   |
| LAKESHORE    | B   | LAS VEGAS     | D   | LEPLEY       | D   | LITTLEFIELD | D   | LOURDES     | C   |
| LAKETON      | B   | LATAH         | C   | LERDAL       | C   | LITTLE PCLE | D   | LOUVIERS    | C   |
| LAKETON      | B   | LATAMCO       | C   | LERCY        | B   | LITTLETON   | B   | LOVEJOY     | C   |
| LAKETON      | B   | LATAKIER      | D   | LESHARA      | B   | LITTLE WOGU | B   | LOVELAND    | C   |
| LAKETON      | B   | LATHAM        | O   | LESMC        | C   | LITZ        | C   | LOVELL      | C   |
| LAKETON      | B   | LATINA        | D   | LESLE        | D   | LIVERMORE   | A   | LOVELOCK    | C/C |
| LAKETON      | B   | LATON         | D   | LESTER       | B   | LIVINGSTON  | D   | LOWELL      | C   |
| LAKETON      | B   | LATONIA       | B   | LE SUEUR     | B   | LIVCNA      | A   | LOWRY       | B   |
| LAKETON      | B   | LATTY         | C   | LETA         | C   | LIZE        | C   | LOWVILLE    | B   |
| LAKIN        | A   | LAUDERDALE    | B   | LETCHER      | D   | LIZZANT     | B   | LOYAL       | B   |
| LAKOMA       | D   | LAUGENOUR     | B/D | LETHA        | D   | LOBUELL     | C   | LOYALTON    | D   |
| LALAAU       | A   | LAUGHLIN      | A   | LETHENT      | C   | LOBELVILLE  | C   | LOYSVILLE   | D   |
| LA LANDE     | C   | LAUMAIA       | B   | LETCRT       | B   | LOBENG      | B   | LOZANO      | B   |
| LALLIE       | D   | LAUREL        | C   | LETTERBOX    | B   | LUBERT      | B   | LGZIER      | D   |
| LAM          | B/D | LAURELMURST   | C   | LEVAN        | A   | LCBITOS     | C   | LUALUALEI   | D   |
| LAMAR        | B   | LAURELWOOD    | B   | LEVASY       | C   | LOCEY       | C   | LUBBOCK     | C   |
| LAMARTINE    | B   | LAUREN        | B   | LEVERETT     | C   | LOCHSA      | B   | LUBRECHT    | C   |
| LAMBERT      | B   | LAYALLEE      | B   | LEVIATHAN    | B   | LOCKE       | B   | LUCAS       | C   |
| LAMBRETH     | C   | LAVEEN        | B   | LEVIS        | C   | LOCKENBY    | C   | LUCIE       | C   |
| LAMINGTON    | D   | LAVELDO       | D   | LEWIS        | D   | LOCKHARD    | B   | LUCEDALE    | B   |
| LAMO         | B   | LAVERRKIN     | C   | LEWISBERRY   | B   | LOCKHART    | B   | LUCERNE     | B   |
| LAMONT       | D   | LAVIAA        | C   | LEWISBURG    | C   | LOCKPCKT    | D   | LUCIEN      | C   |
| LAMONT       | A   | LAWAI         | A   | LEWISTON     | C   | LOCKWOOD    | C   | LUCILE      | B   |
| LAMONTA      | D   | LAWLER        | B   | LEWISVILLE   | C   | LOCUST      | C   | LUCILETON   | B   |
| LAMOURE      | C   | LAWRENCE      | C   | LEX          | B   | LODAR       | A   | LUCKY       | B   |
| LAMPHER      | B   | LAWRENCEVILLE | C   | LEXINGTON    | B   | LODEPA      | D   | LUCKY STAR  | B   |
| LAMPSHIRE    | D   | LAWSON        | B   | LIABTAGS     | D   | LODI        | C   | LUCY        | A   |
| LANSON       | D   | LAWTHER       | D   | LIBBY        | B   | LODC        | D   | LUDDEN      | D   |
| LANARK       | B   | LAWTON        | C   | LIBEG        | A   | LOGFTUS     | C   | LUDLOW      | C   |
| LANCASTER    | B   | LAX           | C   | LIBERAL      | D   | LOFTCN      | D   | LUFKIN      | O   |
| LANCE        | B   | LAYCCK        | B   | LIBERTY      | C   | LOGAN       | C   | LUMCN       | B   |
| LAND         | D   | LAYTON        | A   | LIBORY       | A   | LOGGERT     | A   | LUJANE      | C   |
| LANDES       | B   | LEA           | C   | LIBRARY      | D   | LOGY        | B   | LUKIN       | C   |
| LANDISBURG   | C   | LEADER        | B   | LIGUTTE      | D   | LOHLER      | C   | LULA        | B   |
| LANDLOW      | C   | LEADPCINT     | B   | LICK         | B   | LOHMILLEN   | C   | LUMBEE      | D   |
| LANDUSKY     | D   | LEADVALE      | C   | LICK CREEK   | D   | LOHNS       | A   | LUMMI       | B/C |

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED  
 THE SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION



Table C-1 --Continued

|              |     |            |     |              |     |                |     |                |     |
|--------------|-----|------------|-----|--------------|-----|----------------|-----|----------------|-----|
| LUN          | C   | MALABAR    | A/D | PARKSBORC    |     | PAYFLCWER      | C   | PCVICKERS      | C   |
| LUNA         | C   | MALABON    | C   | MARLA        | A   | MAYHEW         | D   | HEAD           | D   |
| LUNCH        | C   | MALACHY    | B   | MARLBORC     | B   | MAYLAND        | B   | PEACIN         | A   |
| LUNDIMO      | C   | MALAGA     | B   | MARLEAN      | B   | MAYMEN         | D   | HEADCHVILLE    | B   |
| LUNDY        | B   | MALAMA     | A   | MARLETTE     | B   | MAYNARD LAKE   | B   | HEADVILLE      | B   |
| LUNT         | D   | MALAYA     | E   | MARLEY       | B   | MAYO           | B   | HEADER         | D   |
| LUPTON       | C   | MALCCLM    | D   | MARLIN       | D   | MAYODAN        | B   | PECAN          | B   |
| LUKA         | D   | MALEZA     | B   | MARLCW       | C   | MAYCOWORTH     | D   | MECCA          | B   |
| LURAY        | C/D | MALIBU     | D   | MARLTGN      | C   | MAYSDDRF       | B   | MECKESVILLE    | C   |
| LUTE         | D   | MALIN      | C/D | MARPARTH     | B   | MAYSVILLE      | B   | MECKLENBURG    | C   |
| LUTH         | C   | PALJAMAR   | A   | PARA         | D   | MAYTCWN        | C   | MEDA           | B   |
| LUTHER       | B   | MALLCT     | A   | MARPA        | B   | MAYVILLE       | B   | MEDANG         | C   |
| LUTIE        | B   | MALM       | C   | PARQUETTE    | A   | MAYWOOD        | B   | MEDARY         | C   |
| LUTON        | D   | MALG       | B   | MARR         | B   | MAZEPPA        | B   | PEDFGRD        | D   |
| LUVERNE      | C   | MALONE     | B   | MARRIOTT     | B   | PAZCN          | B   | MEDFRA         | D   |
| LUXOR        | C   | MALCTERRE  | D   | PARSOEN      | C   | PAZUM          | C   | MEDICINE LODGE | B   |
| LUZENA       | D   | MALPAIS    | C   | MARSELL      | B   | MCAFEA         | C   | MEDINA         | B   |
| LYCAN        | B   | MALPGSA    | C   | MARSHALL     | B   | MCCALLEN       | B   | MEDNAY         | B   |
| LYCOMING     | C   | MALVERN    | C   | MARSHAN      | D   | MCCALLISTER    | C   | MEES           | A   |
| LYDICK       | B   | MAMALA     | D   | MARSHDALE    | C   | MCCALPIN       | C   | MEETETSE       | C   |
| LYFORD       | C   | MAMOU      | C   | MARSHFIELD   | C   | MCBEE          | B   | MEGGETT        | D   |
| LYLES        | B   | MANAHAA    | C   | MARSING      | B   | MCBETH         | C   | MEGCN          | C   |
| LYMAN        | C/D | MANALAPAN  | C   | MART         | C   | MCBRIDE        | B   | MEHL           | C   |
| LYNCH        | D   | MANANA     | C   | MARTELLA     | B   | MCCABE         | B   | MEHLGRN        | C   |
| LYNCHBURG    | B/D | MANASSA    | C   | MARTIN       | C   | MCCAFFERY      | A   | MEIGS          | D   |
| LYNDEN       | A   | MANASSAS   | B   | MARTINA      | A   | MCCAIN         | C   | MEIKLE         | D   |
| LYNNUYL      | A   | MANASTASH  | C   | MARTINECK    | D   | MCCALER        | D   | MEISS          | D   |
| LYNN HAVEN   | B/D | MANATEE    | H/D | MARTINEZ     | D   | MCCALLY        | B   | MELBOURNE      | B   |
| LYNNVILLE    | C   | MANAWA     | C   | MARTINI      | E   | MCCAPHON       | C   | MELBY          | B   |
| LYNX         | B   | MANCELONA  | A   | MARTINSBURG  | B   | MCCARRAN       | D   | MELITA         | C   |
| LYONMAN      | C   | MANCHESTER | A   | MARTINSDALE  | E   | MCCARTHY       | B   | MELLENTHIM     | D   |
| LYONS        | D   | MANDAN     | B   | MARTINSON    | C   | MCCLAIVE       | C   | MELLCR         | D   |
| LYONSVILLE   | C   | MANDEFIELD | B   | MARTINSVILLE | B   | MCCLEARY       | B   | MELLCY         | C   |
| LYSINE       | D   | MANDEVILLE | B   | MARTINTCN    | C   | MCCLELLAN      | B   | MELGLAND       | C   |
| LYSTAIR      | B   | MANFRED    | C   | MARTY        | B   | MCCLEUD        | C   | MELROSE        | C   |
| LYTELL       | B   | MANGUM     | D   | MARVAN       | D   | MCCOIN         | D   | MELSTONE       | A   |
|              |     | MANHATTAN  | A   | MARVIN       | C   | MCCOLL         | D   | MELTCN         | B   |
| MABEN        | C   | MANHEIM    | C   | MARY         | C   | MCCONNEL       | B   | MELVILLE       | B   |
| MABI         | D   | MANI       | C   | MARYDEL      | B   | MCCOCK         | C   | MELVIN         | D   |
| MABKAY       | D   | MANILA     | C   | MARYSLAND    | D   | MCCCRNICK      | B   | MELPAGCSE      | D   |
| MACAY        | B   | MANISTEE   | B   | MASADA       | C   | MCCCY          | C   | MENPHIS        | B   |
| MACEDONIA    | C   | MANITOU    | C   | MASCAMP      | D   | MCCREE         | B   | MENANGA        | A   |
| MACHETE      | C   | MANLEY     | B   | MASCOTTE     | D   | MCCROY         | D   | MENAN          | C   |
| MACHIAS      | B   | MANLIUS    | C   | MASHEL       | B   | MCCRSKIE       | C   | MENARD         | B   |
| MACK         | C   | MANLCVE    | B   | MASHULAVILLE | B/A | MCCULLOUGH     | C   | MENCH          | C   |
| MACKEN       | D   | MANNING    | B   | PASON        | B   | MCCULLY        | C   | MENDEBGURE     | C   |
| MACKINAC     | B   | MANOR      | B   | PASCNVILLE   | C   | MCCUNE         | D   | MENEGGINO      | B   |
| MACKSBOURG   | B   | MANSFIELD  | B   | MASSACK      | B   | MCCUTCHEN      | C   | MENDON         | B   |
| MACOMB       | B   | MANSIC     | B   | PASSENA      | B   | MCDOLE         | B   | MENDOTA        | B   |
| MACOMRER     | B   | MANSKER    | B   | PASSILLCN    | B   | MCDONALD       | B   | MENEFEE        | D   |
| MAGON        | B   | MANTACHIE  | C   | PASTERSON    | B   | MCDONALDSVILLE | C   | MENFAC         | B   |
| MACY         | D   | MANTEO     | C/D | PATAMOROS    | C   | MCGEEN         | B   | MENLO          | D   |
| MADALIN      | B   | MANTER     | B   | PATANUSKA    | C   | MCFADDEN       | B   | MENC           | C   |
| MADANASKA    | B   | MANTON     | B   | PATANAZAS    | B   | MCFAIN         | C   | MENGENEN       | C   |
| MADDOCK      | A   | MANTZ      | B   | PATAPEAKE    | B   | MCFAYL         | C   | MENKINEE       | B   |
| MADDOX       | C   | MANU       | C   | MATAHAN      | C   | MCGAFFEY       | C   | MENTC          | B   |
| MADELIA      | D   | MANVEL     | C   | MATCHER      | A   | MCGARY         | C   | MENUCR         | B   |
| MADELINE     | D   | PANWOOD    | D   | MATFIELD     | C   | MCGEHEE        | C   | MEQUON         | C   |
| MADERA       | D   | MANZANITA  | C   | MATHERS      | B   | MCGILVERY      | C   | MERCED         | C/D |
| MADISON      | B   | MANZANO    | C   | MATHERTON    | B   | MCGINRY        | B   | MERCEDES       | D   |
| MADONNA      | C   | PANZANOLA  | C   | MATHESON     | B   | MCGIRK         | C   | MERCER         | C   |
| MADRAS       | C   | MAPES      | C   | MATHEWS      | C   | MCGOWAN        | B   | MERCY          | C   |
| MADRID       | B   | MAPLE MT.  | B   | PATHISTCA    | C   | MCGRATH        | B   | MEREDITH       | B   |
| MADUNEZ      | B   | MAPLETON   | C/D | MATLOCK      | D   | MCGREM         | A   | MERETA         | C   |
| MAGALLON     | B   | MARATHON   | B   | MATNCA       | D   | MCHENRY        | B   | MERGLE         | B   |
| MAGENS       | B   | MARBLE     | A   | MATTAPEX     | C   | MCLAWINE       | A   | MENIDIAA       | B   |
| MAGINNIS     | C   | MAKBLMOUNT | B   | MATTGLE      | C   | MCLINTOSH      | B   | MENINO         | D   |
| MAGNA        | D   | MARSETTA   | A   | PAUGE        | B   | MCLINTYRE      | B   | MERKEL         | B   |
| MAGNOLIA     | B   | MARCUM     | B   | MAUGHAN      | C   | MCKAPPE        | D   | MERLIN         | C   |
| MAGNUS       | C   | MAKCUS     | C   | PAUKEY       | C   | MCKAY          | D   | MERPILL        | B/D |
| MAGUAYD      | D   | MACKY      | D   | MAUPEE       | A/D | MCKENNA        | C/D | MERRA          | C   |
| MAHAFFY      | C/D | MARDEM     | C   | MAUNABC      | D   | MCKENZIE       | D   | MENCS          | A   |
| MAHALA       | C   | MARDIN     | C   | MAUPIN       | C   | MCKINLEY       | C   | MERRIFIELD     | B   |
| MAHALASVILLE | B/D | MARENGO    | C/D | MAUREPAS     | D   | MCKINNEY       | D   | MERRILL        | C   |
| MAHANA       | H   | MARESU     | B   | PAURINE      | D   | MCLAIN         | C   | MERRILLAN      | C   |
| MAHASKA      | B   | MARGERUM   | B   | PAURY        | B   | MCLAURIN       | B   | MERRINAC       | A   |
| MAHER        | C   | MARGUERITE | B   | MAVERICK     | C   | MCLEAN         | C   | MERRITT        | B/C |
| MAHONING     | D   | MARIA      | B/C | MAVIF        | D   | MGLECC         | B   | MER RCUGE      | B   |
| MAHUKONA     | B   | MARIANA    | C   | MAWAE        | A   | MCPANON        | C   | PERTCN         | B   |
| MAIDEN       | B   | MARIAS     | D   | MAX          | B   | MCPHEN         | C   | MERTZ          | B   |
| MAILE        | A   | MARICAO    | B   | MAXEY        | C   | MCPULLIN       | C   | MESA           | B   |
| MAJADA       | B   | MARICOPA   | B   | MAXFIELD     | C   | MCMURDIE       | C   | MESCAL         | C   |
| MAKAALAE     | B   | MAMETTA    | C   | PAXSON       | A   | MCMURPHY       | B   | MESCALERO      | C   |
| MAKALAPA     | D   | MANILLA    | C   | PARTCN       | B   | MCMURPHY       | D   | MESITA         | C   |
| MAKAPILI     | A   | PARINA     | A   | MARVILLE     | A   | MCMARY         | D   | MESKILL        | C   |
| MAKAWAN      | B   | MARION     | D   | MAXWELL      | D   | MCPAUL         | B   | MESPAN         | C   |
| MAKAWELI     | H   | MARIPOSA   | C   | MAY          | B   | MCPHERSON      | C   | MESSER         | C   |
| MAKENA       | B   | MASSA      | C   | MAYBERRY     | C   | MCPHIE         | B   | NET            | D   |
| MAKIKI       | B   | PARKES     | D   | PAYBESC      | C   | MCTUAMHIE      | C   | METALINE       | B   |
| MAKOTI       | C   | MARKEY     | D   | PAY DAY      | D   | MCGREEN        | C   | METAPORA       | B   |
| MAL          | B   | MARPKAM    | C   | PAYER        | D   | MCRABE         | B   | METEA          | B   |
| MALA         | B   | PAPKLAND   | C   | MAYFIELD     | B   | MCTAGGART      | B   | METIGUSHE      | A   |

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 TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table C-1--Continued

|             |     |              |     |               |     |             |     |             |     |
|-------------|-----|--------------|-----|---------------|-----|-------------|-----|-------------|-----|
| METOLIUS    | B   | MISSION      | B   | MCGAIFIELD    | B   | NABESNA     | C   | NESS        | D   |
| METRE       | D   | MITCH        | B   | MGRGNIC       | C   | NACEVILLE   | C   | NESSER      | B   |
| METZ        | A   | MITCHELL     | B   | MCRARTY       | D   | NACHES      | B   | NESSOPAH    | B   |
| MEXICO      | D   | MITIWANGA    | C   | MCRICAL       | C   | NACIMIENTO  | C   | NESTER      | C   |
| MHOGN       | D   | MIZPAM       | C   | MCRLEY        | C   | NACCGGDCHES | B   | NESTUCCA    | C   |
| MIAMI       | B   | MCANC        | D   | MCRP/N MESA   | C   | NADEAN      | B   | NETARTS     | A   |
| MIAMIAN     | C   | MCAPA        | D   | MCRCC         | A/C | NADINA      | B   | NETC        | B   |
| MICCO       | A/D | MCAULA       | A   | MCRCH         | D   | NAFF        | B   | NETTLETON   | C   |
| MICHELSON   | B   | MCEETIE      | B   | MCRCP         | C   | NAGEESI     | B   | NEUBERT     | B   |
| MICHIGAMME  | C   | MCCA         | D   | MCRKILL       | B   | NAGITSY     | C   | NEUS        | B   |
| MICK        | B   | MCOCHO       | B   | MORRIS        | C   | NAGLE       | B   | NEUSKE      | B   |
| MIDAS       | D   | MODA         | D   | MORRISON      | B   | NAHMA       | C   | NEVADOR     | C   |
| MIDDLE      | C   | MODALE       | C   | MCRKRW        | C   | NAHUNTA     | C   | NEVILLE     | B   |
| MIDDLEBURY  | B   | MODEL        | C   | MCRSE         | D   | NAINA       | B   | NEVIN       | C   |
| MIDESSA     | B   | MODENA       | B   | MOR'ENSON     | C   | NAKAI       | B   | NEVINE      | B   |
| MIDLAND     | D   | MODESTO      | C   | MCR'CN        | B   | NAKNEK      | D   | NEVCYER     | D   |
| MIDNIGHT    | C   | MODOC        | C   | MGRVAL        | C   | NAMRE       | B   | NEVTAN      | C   |
| MIDVALF     | C   | MOKNKPPIE    | D   | MUSBY         | D   | NANAPKIN    | A   | NEVU        | D   |
| MIDWAY      | D   | MOFFAT       | B   | MUSCA         | A   | NANCY       | B   | NEWARK      | C   |
| MIFFLIN     | B   | MOGOLLON     | B   | MCEL          | C   | NANNY       | B   | NEWART      | B   |
| MIFFLINBURG | B   | MGGUL        | B   | MOMANNON      | B   | NANNYTON    | B   | NEWAYGC     | B   |
| MIGUEL      | C   | MOMAVE       | B   | MOMER         | D   | NANSENE     | B   | NEWBERG     | B   |
| MIKE        | D   | MOMAVE       | B   | MOMHERVILLE   | C   | NANTUCKET   | C   | NEWBERRY    | C   |
| MIKESELL    | C   | MOMAWK       | B   | MOSIDA        | B   | NANUP       | C   | NEWBY       | B   |
| MILACA      | B   | MOKRA        | C   | MOSQUET       | D   | NAPA        | C   | NEW CAMBRIA | C   |
| MILAN       | B   | MOKELUMNE    | D   | MOSBYROCK     | B   | NAPIER      | B   | NEW CASTLE  | B   |
| MILES       | B   | MOKENA       | C   | MCA           | B   | NAPLES      | B   | NEWCCMB     | A   |
| MILFORD     | C   | MOKULEIA     | B   | MCTSVILLE     | A   | NAPPANE     | D   | NEWDALE     | B   |
| MILHAM      | C   | MOLAND       | B   | MULTON        | B   | NAPTCONE    | B   | NEWELL      | B   |
| MILHEIM     | C   | MOLCAL       | B   | MOUND         | C   | NAHANJITU   | C   | NEWELLTON   | D   |
| MILL        | B   | MOLENA       | A   | MOUNTAINBURG  | D   | NAHANJE     | C   | NEWFANE     | C   |
| MILLARD     | B   | MOLIMIS      | B   | MOUNTAINVIEW  | B/D | NARGISSE    | B   | NEWFORK     | D   |
| MILLBORO    | D   | MOLLY        | B   | MOUNTAINVILLE | B   | NARD        | B   | NEWKIRK     | B   |
| MILLBROOK   | B   | MOLOKAI      | B   | MOUNT AIRY    | A   | NARLON      | C   | NEWLANDS    | B   |
| MILLBURNE   | B   | MOLSON       | B   | MOUNT CARROLL | B   | NARCA       | B   | NEWLIN      | B   |
| MILLCREEK   | B   | MOLYNEUX     | B   | MOUNT HOPE    | B   | NARAGANSETT | B   | NEWMARKET   | B   |
| MILLER      | D   | MOMAD        | A   | MOUNT HOOD    | B   | NARROWS     | D   | NEWPORT     | C   |
| MILLERLUX   | D   | MOMAHAN      | C   | MOUNT LUCAS   | B   | NASER       | B   | NEWRY       | B   |
| MILLERTON   | D   | MOMAHANS     | D   | MOUNT CLIVE   | D   | NASH        | A   | NEWSEAN     | B   |
| MILLET      | B   | MOMARDA      | D   | MOUNTVIEW     | B   | NASHUA      | A   | NEWSTEAD    | D   |
| MILGROVE    | B/D | MOMCLOYA     | B   | MOVILLE       | D   | NASHVILLE   | B   | NEWTON      | A/D |
| MILL HOLLOW | B   | MOMDAMIN     | C   | MOWATA        | C   | NASCN       | C   | NEWTONIA    | B   |
| MILLICH     | D   | MOMOCVI      | B   | MOWER         | C   | NASSAU      | C/D | NEWTON      | C   |
| MILLINGTON  | B   | MOMEE        | D   | MOWINA        | D   | NASSET      | B   | NEWVILLE    | C   |
| MILLIS      | C   | MOMICO       | B   | MUCAHA        | D   | NATALIE     | C   | NEZ PERCE   | C   |
| MILLRACE    | B   | MOMIDA       | B   | MUCET         | C   | NATCHEZ     | B   | NIAGARA     | C   |
| MILLSAP     | C   | MOMITEAU     | D   | MUDRAY        | D   | NATHROP     | B   | NIART       | B   |
| MILLSDALE   | B/D | MOMMOUTH     | C   | MUD SPRINGS   | C   | NATIONAL    | B   | NIBLEY      | B   |
| MILLSHOLM   | C   | MOMO         | D   | MUGGUSE       | C   | NATRONA     | B   | NICHOLSON   | C   |
| MILLVILLE   | B   | MOMOLITH     | C   | MUIR          | B   | NATURITA    | B   | NICHOLVILLE | C   |
| MILLWOOD    | D   | MOMGMA       | B   | MUIRKIRK      | B   | NAUKATI     | D   | NICKEL      | B   |
| MILNER      | C   | MOMONGAMELA  | C   | MUKILTEC      | D   | NAUMBURG    | C   | NICKLE      | B   |
| MILPITAS    | C   | MOMRCE       | B   | MULDROW       | D   | NAVAJO      | D   | NICCOEMUS   | B   |
| MILROY      | D   | MOMRCEVILLF  | C/D | MULKEY        | C   | NAVAN       | D   | NICOLAUS    | C   |
| MILTON      | C   | MOMSE        | B   | MULLINS       | D   | NAVARCO     | B   | NICOLLET    | B   |
| MIMBAES     | C   | MOMSERATE    | C   | MULT          | C   | NAVESINK    | C   | NIELSEN     | U   |
| MIMOSA      | D   | MOMTAGUE     | D   | MULTICRGR     | A   | NAYLOR      | B   | NIGHTHAWK   | B   |
| MINAM       | B   | MOMTALTO     | C   | MUMFORD       | B   | NAZ         | B   | NIMILL      | B   |
| MINATARE    | D   | MOMTARA      | D   | MUNDELEIN     | B   | NEAPOLIS    | B/D | NIRISHKA    | B   |
| MINCHEY     | B   | MOMTAUR      | C   | MUNISING      | C   | NEBEKER     | C   | NIRLASON    | B   |
| MINGO       | B   | MOMTCALM     | A   | MUNK          | B   | NEBISH      | B   | NIRKLAJ     | D   |
| MINDALE     | B   | MOMTE CRISTO | D   | MUNSON        | D   | NEBO        | B   | NILAND      | C   |
| MINDOGL     | B   | MOMTEGRANDE  | D   | MUNUSCENG     | D   | NECHE       | C   | NILES       | C   |
| MINDEMAN    | R   | MOMTELL      | D   | MURDOG        | D   | NEDELAND    | B   | NIMROD      | C   |
| MINDEN      | C   | MOMTELLO     | C   | MURDOCK       | C   | NEEDHAM     | D   | NINCH       | C   |
| MINE        | B   | MOMTEVALLO   | D   | MUREN         | B   | NEEDLE PEAK | C   | NINEMILE    | D   |
| MINEOLA     | B   | MOMTGMERY    | D   | MURRILL       | B   | NEEDMCRE    | C   | NINEVEH     | B   |
| MINER       | D   | MOMTICELLO   | B   | MUSCATINE     | B   | NEELEY      | B   | NINIGRET    | B   |
| MINERAL     | A   | MOMTIETH     | A   | MUSE          | C   | NEGITA      | B   | NININGER    | B   |
| MINEKAL MT. | B   | MOMTPORENCI  | B   | MUSSELLA      | B   | NEGLEY      | B   | NINNESCAM   | B   |
| MINERVA     | C   | MOMTOSA      | C   | MUSICK        | B   | NEHALEM     | B   | NIDBELL     | C   |
| MING        | B   | MOMTCUR      | D   | MUSINTA       | B   | NEILTON     | A   | NIDTA       | D   |
| MINGO       | B   | MOMTCYA      | C   | MUSKINGUM     | C   | NEISSON     | B   | NIPE        | B   |
| MINIDOKA    | C   | MOMTELLIER   | C   | MUSKOGEE      | C   | NEKIA       | C   | NIPPERINK   | B   |
| MINNETSKA   | C   | MOMTRUSE     | B   | MUSSELSHELL   | B   | NELLIS      | B   | NIPSUP      | C   |
| MINNEBOA    | A   | MOMTVALE     | D   | MUSSEY        | D   | NELSCOTT    | D   | NIRA        | B   |
| MINNEQUA    | B   | MOMTVERDE    | A/D | MUSTANG       | A/D | NELSON      | B   | NISNA       | C   |
| MINNETONKA  | D   | MOMTWELL     | C   | MUTALA        | B   | NEPAT       | C   | NISPCN      | U   |
| MINNEWAUKAN | D   | MOCODY       | B   | MUTUAL        | B   | RENANA      | B   | NISQUALLY   | A   |
| MINNETECE   | B   | MOMMCO       | R   | MYAKKA        | A/C | RENAL       | B   | NISSWA      | B   |
| MINGA       | C   | MOCSE RIVER  | C   | MYATT         | B/C | NECLA       | D   | NIU         | B   |
| MINGO       | C   | MOPA         | B   | MYERS         | B   | NEGTCMA     | D   | NIULII      | C   |
| MINTO       | B   | MORADO       | C   | MYERSVILLE    | B   | NEPESTA     | B   | NIWLCC      | C   |
| MINU        | D   | MORALEZ      | E   | MYLHEA        | B   | NEPPI       | C   | NIMCT       | C   |
| MINVALLE    | B   | MORFO        | C   | MYRICK        | D   | NLPPPEL     | B   | NIXA        | C   |
| MIRARAL     | C   | MORFAU       | E   | MYRTLE        | B   | NEPTUNE     | A   | NIXON       | B   |
| MIRACLE     | B   | MORREHEAD    | C   | MYSTEN        | A   | NEKESON     | B   | NIXTON      | E   |
| MIRAMAR     | B   | MORHCUSE     | C   | MYSTIC        | D   | NESDA       | A   | NIZIAN      | A   |
| MIRANDA     | D   | MORLANDTON   | E   | MYTON         | B   | NESHAMINY   | B   | NOBLE       | B   |
| MIRFS       | B   | MORELANDTON  | E   |               |     | NESIKA      | B   | NOBSCOTT    | A   |
| MIRNUR      | B   | MCREY        | E   | N-BAR         | B   | NESKWIN     | B   | NOODAWAY    | B   |
| MIRROF LAKE | A   | MCFITT       | D   | NAALEHU       | B   | NESPELEM    | B   | NUEL        | D   |

NOTES: A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED  
THO SOIL GROUPS SUCH AS P/C INDICATES THE DRAINER/IMPAIRED SITUATION

Table C-1--Continued

|                |     |            |     |             |     |               |     |              |     |
|----------------|-----|------------|-----|-------------|-----|---------------|-----|--------------|-----|
| NOMILI         | D   | CCILLA     | C   | CNSLCO      | B   | DNSSO         | B   | PARALGMA     | C   |
| NOKASIPPT      | D   | CCKLEY     | B   | ONTARIO     | B   | GWYHEE        | B   | PARAMORE     | D   |
| NOKAY          | C   | CCPEE      | A/D | CATKO       | B/D | GRALIS        | C   | PARASGL      | B   |
| NOKOMIS        | B   | CCONEE     | C   | CNTCAGCN    | D   | ORBCW         | C   | PARCELAS     | D   |
| NOLAN          | B   | CCNTO      | B   | GNVX        | B   | QXERIE        | C   | PARDEE       | D   |
| NOLICHUCKY     | B   | CCLSTA     | C   | CCKALA      | A   | CXFRD         | C   | PAREMAT      | B   |
| NOLIN          | B   | CCQUEOC    | B   | CPAL        | D   | CZAMIS        | B/D | PARENTE      | C   |
| NULO           | B   | CCTAGON    | B   | OPEGUOM     | C/D | OZAM          | D   | PARIETTE     | C   |
| NOME           | C   | CDLL       | B   | CPHIR       | C   | CZAUKEE       | C   | PARIS        | C   |
| NCNDALTON      | B   | CDERMOTT   | C   | CPHMKAC     | D   |               |     | PARISHVILLE  | C   |
| NONOPAMU       | D   | CDSSA      | D   | CGUAGA      | C   | PAAIKI        | B   | PARKAY       | B   |
| NGUKACHAMPS    | C/D | CDIN       | C   | ORA         | C   | PAALCA        | B   | PARKDALE     | B   |
| NOLKSACK       | B   | CDNE       | C   | CRAN        | B   | PAUHAU        | A   | PARKE        | B   |
| NOONAN         | D   | CDFALLON   | D   | CRANGE      | D   | PACHAPPA      | B   | PARKER       | B   |
| NOMA           | B   | ODDEN      | D   | CRANCEBURG  | J   | PACHECC       | B/C | PARKFIELD    | C   |
| NORAD          | B   | OGGECHEE   | C   | CRCAS       | I   | PACK          | C   | PARKHILL     | D   |
| NORBURNE       | B   | CGEMAN     | C   | GCCHARD     | B   | PACKARD       | B   | PARKHURST    | B   |
| NORBY          | B   | CGILVIE    | C   | ORD         | A   | PACKEM        | C   | PARKINSON    | B   |
| NORCO          | B   | CGLALA     | B   | CRONANCE    | C   | PACKHAM       | B   | PARKVILLE    | C   |
| NORJEN         | B   | UGLE       | B   | UPDWAY      | U   | PACKSADDLE    | B   | PARKWOOD     | A/D |
| NGARDNESS      | B   | GHAYSI     | C   | GRELIA      | D   | PACKWCCU      | D   | PARLEYS      | B   |
| NGFOLK         | B   | GHIA       | A   | GRELLA      | J   | PACULET       | C   | PARLIN       | C   |
| NGRGE          | B   | OJAI       | B   | CREM        | A   | PACTCLUS      | B   | PARLO        | C   |
| NGKKA          | B   | OJATA      | D   | CRESTIMBA   | C   | PADEN         | C   | PARMA        | C   |
| NGKMA          | B   | CKANCGAN   | B   | CHFCND      | C   | PADRMI        | B   | PARNELL      | D   |
| NGKST          | C   | CKAW       | D   | CRIDIA      | C   | PADUCAM       | B   | PARRA        | B   |
| NGKIS          | C   | CKEECHOBEE | A/D | CRIF        | A   | PAOUS         | B   | PARRAN       | D   |
| NORTHDALE      | C   | CKEELANTA  | A/D | CRIC        | C   | PAESL         | B   | PARRISH      | C   |
| NORTHFIELD     | B   | CKEMAM     | C   | CRICN       | B   | PAGET         | B   | PARRSHALL    | B   |
| NORTHPORT      | B   | CKLARED    | B   | CRITA       | B   | PAGODA        | C   | PARKSPANY    | D   |
| NORTHPOCER     | C   | CKLANAMA   | A/D | GRLAND      | B   | PANNAGAT      | C   | PARSONS      | D   |
| NORTHUMBERLAND | C/D | CKMGK      | C   | CRLANDC     | A   | PANNEAM       | D   | PARRI        | C   |
| NORTON         | C   | CKO        | U   | CKMAN       | C   | PANRCC        | D   | PASAGZHAK    | B   |
| NORTONVILLE    | C   | CKUBOJI    | C   | URMSBY      | B/C | PAIA          | C   | PASCC        | B   |
| NORTUNE        | U   | CKLONA     | C   | CHODELL     | C   | PAICE         | C   | PASC SEGO    | D   |
| NOKWALK        | B   | CKPEEK     | D   | GRFCING     | B   | PAINESVILLE   | B   | PASCUETTI    | C/D |
| NORWAY FLAT    | A   | CKTIBBEHA  | U   | CHD GRANDE  | D   | PAINTROCK     | B   | PASCUOTANK   | B/D |
| NOKWELL        | C   | OLA        | C   | CPENC       | C   | PAIT          | B   | PASSAR       | C   |
| NORWICH        | D   | OLAA       | A   | GRCVADA     | C   | PAJARITO      | C   | PASS CANYON  | D   |
| NORWOOD        | B   | OLALLA     | C   | CKA         | C   | PAJARO        | C   | PASSCREEK    | B   |
| NOTI           | D   | CLANTA     | B   | LPRVILLE    | C   | PAKALA        | B   | PASTURA      | D   |
| NOTUS          | A   | CLATHE     | C   | CKSA        | A   | PAKINI        | B   | PATAMS       | B   |
| NOVAHA         | B   | GLD CAMP   | C   | CRSING      | A   | PALA          | B   | PATENT       | C   |
| NOVAMY         | B   | OLUHAM     | C   | CKTELLC     | A   | PALACIC       | B   | PATILLAS     | B   |
| NOVADO         | C   | CLDS       | C   | CKTIGALITA  | C   | PALAPALAI     | B   | PATILO       | C   |
| NOVY           | C   | CLUSPAR    | B/D | LRTING      | C   | PALATINE      | B   | PATIT CREEK  | C   |
| NOVY           | C   | CLOWICK    | B   | CRITZ       | C   | PALESTINE     | B   | PATNA        | C   |
| NOLKOLLS       | C   | CLELO      | B   | CRWEDD      | B   | PALISADE      | B   | PATCUTVILLE  | C   |
| NUCLA          | B   | CLENA      | B   | CSAGE       | D   | PALMA         | B   | PATRICIA     | B   |
| NUCCES         | C   | CLEQUA     | B   | CSAKIS      | B   | PALMAHEJD     | C   | PATRICK      | B   |
| NUGGAT         | C   | CLETE      | B   | CSGOCO      | B   | PALM BEACH    | A   | PATRCLE      | C   |
| NUMA           | C   | OLEX       | B   | CSA         | B   | PALMER        | D   | PATTANI      | C   |
| NUMDA          | C   | CLGA       | C   | CSHAWA      | D   | PALMER CANYON | B   | PATTENBURG   | B   |
| NUMICA         | C   | CLI        | B   | CSHEA       | C   | PALMICH       | B   | PATTERSON    | C   |
| NUMN           | C   | CLIAGA     | B   | CSKCSH      | C   | PALMS         | C   | PATTON       | B/C |
| NUSS           | D   | CLINDA     | B   | CSHTMD      | B   | PALMYRA       | B   | PATWAY       | C   |
| NUTIFY         | C   | CLIPHANT   | H   | CSIER       | B/D | PALU          | B   | PAUL         | B   |
| NUTIAS         | C   | CLIVHAIN   | C   | CSKA        | C   | PALLPAS       | B   | PAULDING     | D   |
| NUTRICSO       | B   | CLIVER     | A   | CSPUND      | C   | PALLPINO      | D   | PAULINA      | D   |
| NUVALDF        | C   | CLIVIER    | A   | CSO         | B   | PALUS VERDES  | B   | PAULSELL     | D   |
| NYALA          | D   | CLMITO     | D   | CSOBR       | D   | PALUSE        | B   | PAULVILLE    | B   |
| NYMCRF         | A   | CLMITZ     | J   | CSCHIDGE    | C   | PALSURVE      | B   | PALPALU      | B   |
| NYSSA          | C   | CLMOS      | C   | CSLTC       | B   | PAPLICO       | B   | PALSAUGUNT   | U   |
| NYSSATON       | B   | CLMSTED    | B/D | CSJAN       | C   | PANLA         | C   | PAUSAAT      | B   |
| NYSTRON        | C   | CLNEY      | B   | GST         | B   | PANSOEL       | D   | PAUNELA      | B   |
|                |     | CLCKUI     | C   | CSRANDER    | B   | PANA          | B   | PAVAMREC     | B   |
| CAHE           | B   | CLPE       | C   | CTERC       | B   | PANALA        | D   | PAVANT       | D   |
| CAKDALE        | H   | CLSCN      | C   | CTHELLC     | U   | PANAENA       | D   | PAVILLICK    | B   |
| CAKDEN         | D   | CLTON      | C   | CTIS        | C   | PANASCFKKEE   | U   | PANCATUCK    | U   |
| CAKFRD         | H   | CLUSTEE    | B/D | CTISCO      | A   | PANCHEKI      | B   | PANLET       | B   |
| CAK GLEN       | H   | CLYIC      | B   | CTISVILLE   | A   | PANCHUELA     | C   | PANNEE       | U   |
| CAK GROVE      | C   | CLYMPIC    | B   | CTLEY       | B   | PANCC         | E   | PAXTON       | C   |
| CAK LAKE       | B   | CMAMA      | B   | CTSECC      | C   | PANDLAM       | C   | PAYETTE      | B   |
| CAKLAND        | C   | CMAG       | C   | CTTER       | B/D | PANDURA       | U   | PAYPASTER    | B   |
| OAKS RIDGE     | C   | CMEGA      | J   | CTTERBEIN   | C   | PANDURA       | D   | PAYNE        | C   |
| OAKVILLE       | A   | CMENA      | B   | CTTERHCLT   | H   | PANE          | B   | PAYSCN       | D   |
| OAKWOOD        | D   | CMNI       | C   | CTTKEF      | A   | PANQUITCH     | B   | PEACHAP      | D   |
| OAKAPUKA       | B   | CMA        | A/D | CTWJY       | D   | PANHILL       | E   | PEARL HARBOR | U   |
| OASIS          | B   | CMALASKA   | B   | UTWELL      | C   | PANICQUE      | B   | PEARMAN      | C   |
| OATMAN         | B   | CMAMIA     | H   | CLACHITA    | C   | PARRY         | C   | PEARSCLL     | D   |
| OBAK           | C   | CMANGA     | P   | LUMAY       | A   | PANCCHE       | U   | PEAVINE      | C   |
| OBAK           | B   | CMANA      | D   | CLTLET      | A   | PANLLA        | A   | PECATONICA   | C   |
| OBAY           | D   | CMANAY     | B   | LVALL       | C   | PANSEY        | D   | PECCS        | C   |
| OBURN          | U   | CMJAWA     | B   | CVFKAARD    | C   | PANTHEI       | C   | PEDEE        | C   |
| OCALA          | D   | CNEIDA     | B   | CVKELY      | C   | PANTON        | C   | PEDERNALES   | C   |
| OCHEARET       | D   | CNEILL     | B   | LVERTON     | C   | PAULA         | A   | PEDIGG       | B/C |
| OCHEART        | A   | CNEONTA    | H   | CVID        | C   | PAL LI        | B   | PEULAK       | D   |
| OCHEYMAN       | B   | CONITA     | C   | CVINA       | B   | PAPAA         | C   | PEDRICK      | B   |
| OCHELOCKNEEL   | B   | CONITE     | B   | CVNECC      | D   | PAPAI         | A   | PEEBLES      | C   |
| OCHE           | D   | CONITA     | C   | CVNEN CREEK | C   | PAPAKATING    | D   | PEEL         | C   |
| OCHE           | C   | CONVA      | D   | CVFNS       | D   | PAPLEP        | C   | PEELER       | B   |
| OCHEPEL        | B/D | CONKAY     | D   | CVNI        | B   | PAPACISE      | C   | PEEVER       | C   |

NOTES: A PLAIN HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED  
TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

Table C-1--Continued

|              |     |                |     |              |     |              |   |              |     |
|--------------|-----|----------------|-----|--------------|-----|--------------|---|--------------|-----|
| PEGLER       | D   | PIE CREEK      | D   | PEE          | B/C | PREBLE       | C | QUINN        | D   |
| PEGHAM       | A   | PIERIAN        | A   | PEGANLAB     | C   | PRENTISS     | C | QUINNEY      | C   |
| PEKIN        | C   | PIERPONT       | C   | PEGUE        | B   | PRESSUE ISLE | B | QUINTON      | C   |
| PELMAP       | B/D | PIERRE         | D   | PEHAKUPU     | A   | PRESTO       | A | QUITMAN      | C   |
| PELLIL       | C   | PIIMUNUA       | A   | PEINSETT     | B   | PRESTON      | A | QUONSET      | A   |
| PELLA        | U   | PIKE           | B   | PEINT        | B   | PREWITT      | C |              |     |
| PELONA       | C   | PILCHUCK       | A   | PEIAT ISAFEL | C   | PREY         | D | RABER        | C   |
| PENBERTON    | A   | PILGRIM        | B   | PEJOAQUE     | B   | PRICE        | C | RABEY        | A   |
| PENBRIA      | C   | PILOT          | B   | PEKEGEMA     | B   | PRIDA        | D | RABIDEUX     | B   |
| PENBRIDGE    | B   | PILCT ROCK     | C   | PEKER        | B   | PRIDHAM      | D | RABUN        | B   |
| PENA         | B   | PIMA           | B   | PELANG       | B   | PRIETA       | C | RACE         | D   |
| PENCE        | A   | PINAL          | D   | PELAN        | B   | PRIMEAUX     | C | RACHEAT      | D   |
| PENDEN       | B   | PINALENO       | B   | PELATIS      | C   | PRIMGAR      | B | RACINE       | B   |
| PEND WHELLE  | B   | PINATA         | C   | PELE         | A   | PRINCETON    | B | RACCON       | D   |
| PENDUJAY     | D   | PINAVETES      | A   | PELEBAK      | C   | PRINEVILLE   | C | RAD          | C   |
| PENISTAJA    | B   | PINCHER        | C   | PELELINE     | B   | PRING        | B | RADFORD      | B   |
| PENITENTE    | C   | PINCKNEY       | C   | PELEL        | C   | PRINS        | C | RADLEY       | C   |
| PENIN        | C   | PINCONNING     | D   | PELEY        | C   | PRLECTOR     | B | RADNOR       | D   |
| PENNETL      | C   | PINCUSHION     | B   | PELLICH      | C   | PROGRESSO    | C | RAFAEL       | D   |
| PENNINGTON   | B   | PINEA          | B/D | PELLARD      | C   | PROMISE      | D | RAGLAN       | C   |
| PENNISULA    | C   | PINEALE        | B   | POLLASKY     | C   | PRMC         | D | RAGMAR       | B   |
| PENO         | C   | PINEQUEST      | B   | PELLY        | B   | PROMONTORY   | B | RAGG         | C   |
| PENOYER      | C   | PINELLOS       | A/D | PCLG         | B   | PRUNG        | C | RAGSDALE     | B/D |
| PENROSE      | D   | PINETOP        | C   | PCLSLA       | C   | PROSPECT     | B | RAGTOWN      | D   |
| PENTHOUSE    | D   | PINEVILLE      | B   | PCLVADERA    | C   | PROSPEK      | B | RAHF         | C   |
| PENTZ        | D   | PINEY          | C   | PCPAT        | C   | PROSSER      | C | RAIL         | C/D |
| PENWOOD      | A   | PINICCN        | B   | PCPELLE      | C   | PRUTIVIN     | C | RAINBOW      | C   |
| PEUGA        | C   | PINKEL         | C   | PCPPANC      | A/D | PROUT        | C | RAINEY       | B   |
| PEOH         | C   | PINKSTON       | B   | PCPPONIC     | C   | PRECIDENCE   | C | RAINS        | B/D |
| PEONE        | B/C | PINNACLES      | C   | PCPPTCA      | B   | PROVG        | C | RAINSBORO    | C   |
| PEUTONE      | C   | PINU           | C   | PCMRCY       | B   | PRCVC BAY    | D | RAKE         | D   |
| PEPOIN       | B   | PINGLA         | C   | PCNCENA      | D   | PRCNERS      | B | RALSSEN      | B/C |
| PEOUEA       | C   | PINGLE         | B   | PCNCHA       | A   | PIARMIGAN    | B | RAMADA       | C   |
| PERCHAS      | D   | PINCA          | C   | PCAD         | B/C | PUAULU       | A | RAMADERO     | B   |
| PERCIVAL     | C   | PINLNF5        | D   | PUNE CREEK   | B   | PUCHYAN      | A | RANBLER      | B   |
| PERELLA      | C   | PINTAS         | U   | PCNCILLA     | A   | PUDDLE       | D | RAPELLI      | C   |
| PERHAM       | C   | PINTLAR        | A   | PCNIL        | D   | PUERCO       | D | RAMIRES      | D   |
| PERICO       | B   | PINTC          | C   | PCNTCC       | B   | PUEIT        | C | RAMPPEL      | C   |
| PERKINS      | C   | PINTURA        | A   | PCAZER       | D   | PUGET        | C | RANC         | C   |
| PERKS        | A   | PIATWATER      | C   | PCCKU        | A   | PUGSLEY      | B | RANCA        | B   |
| PERLA        | C   | PIOPGLIS       | D   | PCOLE        | B/D | PUMI         | A | RANPART      | B   |
| PERMA        | A   | PIPER          | B/C | PCCLER       | D   | PUMIAU       | D | RANPARTAR    | A   |
| PERMANENTE   | C   | PIHOLETTE      | C   | PCCFMA       | B   | PULASKI      | B | RANSEY       | D   |
| PERRIN       | B   | PISGAM         | C   | PCPE         | B   | PULFEM       | B | RANSHORN     | B   |
| PERKINE      | D   | PISHKUN        | B   | PCPPLETCA    | A   | PULLMAN      | D | RANCC        | C   |
| PERRUT       | D   | PISTAKEE       | B   | PCCLONCK     | C   | PULS         | D | RANCHERIA    | B   |
| PERRY        | D   | PIT            | D   | PCWRETT      | B/D | PULSIPHER    | C | RANC         | B   |
| PERRYVILLE   | B   | PITTMAN        | C   | PCHT         | B   | PULTNEY      | C | RANDAC       | C   |
| PENSAVY      | D   | PITTSFIELD     | Z   | PCRTAGEVILLE | D   | PUMPER       | D | RANDALL      | D   |
| PERSHING     | C   | PITTSSTOWN     | C   | PCRTALES     | C   | PUNA         | A | RANCOLPH     | D   |
| PERKIS       | B   | PITTWOOD       | B   | PCRT BYRN    | B   | PUNALUU      | C | RANCS        | C   |
| PERT         | D   | PLACENTIA      | C   | PCRTERS      | B   | PUNGHU       | A | RANGER       | D   |
| PERU         | C   | PLACERITOS     | C   | PCRTERVILLE  | D   | PURDAM       | C | RANIER       | L   |
| PESCADERO    | C/D | PLACIO         | A/D | PCRTHILL     | C   | PURDY        | D | RANKIN       | C   |
| PESET        | C   | PLACK          | C   | PCRTING      | C   | PURGATORY    | D | RANTOUL      | D   |
| PESHASTIN    | B   | PLAINFIELD     | A   | PCRTLAND     | D   | PURNER       | D | RANYHAN      | B   |
| PEFU         | C   | PLAINVIEW      | C   | PCRTNEUF     | B   | PURSLEY      | B | RAPELJE      | C   |
| PETEETNET    | D   | PLAISTED       | C   | PCRTCLA      | C   | PURVES       | D | RAPHO        | C   |
| PETERHARD    | B   | PLANC          | B   | PCRTSPCUTH   | D   | PUSTOI       | A | RAPIDAN      | B   |
| PETERS       | D   | PLATA          | B   | PCESANT      | C   | PUTNAM       | C | RARGEN       | C   |
| PETUSKY      | D   | PLATEAU        | C   | PCSEY        | B   | PUUKALA      | D | RARICK       | C   |
| PETRIE       | D   | PLATNER        | C   | PCSITAS      | D   | PUUCNE       | C | RARITAN      | B   |
| PETHOLIA     | D   | PLATY          | C   | PCSKIN       | C   | PUU CC       | A | RASBAND      | B   |
| PETTUNS      | C   | PLATC          | C   | PCSCS        | C   | PUU CPAE     | B | RASSET       | B   |
| PEWAMP       | B/D | PLATTE         | C   | PCST         | D   | PUU PA       | B | RATHBUN      | C   |
| PEYTON       | B   | PLATTVILLE     | E   | PCTAMP       | D   | PUYALLUP     | B | RATLIFF      | B   |
| PHAGE        | B   | PLAZA          | B/C | PCTLATCH     | C   | PYLE         | A | RATCN        | C   |
| PHAR         | U   | PLEASANT       | C   | PCTRATZ      | C   | PYLCA        | C | RATTLER      | B   |
| PHARCLIG     | U   | PLEASANT GROVE | B   | PCTSOAM      | C   | PYCTE        | A | RAUB         | B   |
| PHABA        | C   | PLEASANTUN     | B   | PCTTFR       | C   | PYRAPID      | C | RAUVILLE     | C   |
| PHFINLY      | R   | PLEASANT VALF  | E   | PCITTER      | C   | PYRMONT      | D | RAUZI        | B   |
| PHFLAN       | B   | PLEASANT VIEW  | B   | PCITTS       | B   |              |   | RAVALLI      | C   |
| PHLLPS       | B   | PLEPGER        | C   | PCUCRE       | B   | QUAKER       | C | RAVENDALE    | D   |
| PHIFCHSON    | H   | PLEFK          | C   | PCULTNEY     | B   | QUAKERTOWN   | B | RAVENNA      | C   |
| PHILJCN      | B/D | PLELINE        | C   | PCVERTY      | A   | QUAMBA       | D | RAYCLA       | B   |
| PHILLIPS     | C   | PLEVNA         | C   | PCWCKR       | B   | QUANAM       | B | RAMAH        | B   |
| PHILLIPSHURG | A   | PLCME          | C   | PCNCRPHURN   | C   | QUANDAH      | B | RAMHIDE      | D   |
| PHILJ        | B   | PLCYER         | B   | PLWELL       | C   | QUAKLES      | C | RANSEN       | B   |
| PHILOMATH    | D   | PLUMAS         | P   | PCWER        | B   | QUANTZBURG   | C | RAY          | B   |
| PHIPPS       | C   | PLUMMER        | B/D | PCWHITE      | C   | QUATAMA      | C | RAYADO       | C   |
| PHOLSE       | B   | PLUSH          | B   | PCWLEY       | D   | QUAY         | C | RAYENOUF     | B   |
| PHUNTA       | D   | PLUTH          | B   | PCWATKA      | C   | QUEBRADA     | C | RAYMONDVILLE | D   |
| PIASA        | D   | PLUTOS         | C   | PCV          | D   | QUEETS       | B | RAYNE        | B   |
| PICACHO      | C   | PLYMOUTH       | A   | PCYGAN       | D   | QUENACU      | C | RAYNESFORD   | B   |
| PICAYLNE     | H   | PPALL          | C   | PCZC         | C/D | QUENZER      | D | RAYNHAM      | C   |
| PICKAWAY     | C   | PCARCH         | B   | PLZC BLANCC  | B   | QUICKSELL    | C | RAYNOR       | D   |
| PICKENS      | D   | PCALLA         | A   | PRAG         | C   | QUIGLEY      | B | RAZCR        | B   |
| PICKETT      | B   | PCCATFLLD      | B   | PRATNER      | B   | QUILCENE     | C | RAZCR        | C   |
| PICKFORD     | D   | PCCKER         | D   | PRATLEY      | C   | QUILLAYUTE   | B | REACING      | C   |
| PICKWICK     | B   | PUCCOKE        | D   | PRATT        | A   | QUIMBY       | C | READINGTON   | C   |
| PICU         | B   | PCDC           | D   | PREACHER     | B   | QUINCY       | A | READLYN      | B   |
| PICTHU       | B   | PCDUNK         | B   | PERISH       | D   | QUINLAN      | C | REAGAN       | B   |

NOTES: A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED. TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION.

Table C-1--Continued

|            |     |               |     |               |   |               |     |               |     |
|------------|-----|---------------|-----|---------------|---|---------------|-----|---------------|-----|
| REAKOR     | B   | RMOADES       | D   | PECK RIVER    | B | RUDYARD       | G   | SALPCM        | H   |
| REAL       | D   | RIB           | C   | RECKTON       | B | RUELLA        | H   | SALOL         | D   |
| REAP       | D   | RICCO         | D   | RECKWELL      | B | RUGGLES       | B   | SALCHIE       | B   |
| REARDAM    | C   | RICETON       | B   | RECKWOOD      | B | RUIDOSO       | C   | SALTAIR       | D   |
| REAVILLE   | C   | RICEVILLE     | C   | RECKY FCRD    | B | RUKO          | D   | SALT CHUCK    | A   |
| REBA       | C   | RICHARDSON    | B   | REDDY         | B | RULE          | B   | SALTER        | B   |
| REBEL      | B   | RICHEAU       | D   | RCDMAN        | A | RULICK        | C   | SALTERY       | D   |
| REBUCK     | C   | RICHEY        | C   | ROE           | C | RUMBO         | C   | SALT LAKE     | D   |
| RECLUSE    | D   | RICHFIELD     | C   | RCEBUCK       | D | RUMFORD       | B   | SALUDA        | C   |
| REDBANK    | B   | RICHFORD      | A   | ROELLEN       | D | RUMNEY        | C   | SALUVIA       | C   |
| RED BAY    | B   | RICHLIE       | A   | RCESIGER      | B | RUMPLE        | C   | SALVISA       | C   |
| RED BLUFF  | B   | RICHMOND      | C   | RCHNERVILLE   | B | RUN RIVER     | C   | SALZER        | D   |
| RED BUTTE  | B   | RICHTER       | B   | RCHREYSVILLE  | C | RUNE          | C   | SAMEA         | D   |
| REDBY      | C   | RICHVALE      | B   | RCKEBY        | D | RUNNELLS      | C   | SAMISH        | C/D |
| REDCHIEF   | C   | RICHVIEW      | C   | ROLETTE       | C | RUNNYMEDE     | B   | SAMPANISH     | C   |
| REDCLOUD   | B   | RICHWOOD      | B   | ROLFE         | C | RUPERT        | A   | SAMPSEL       | D   |
| REDDICK    | C   | RICKMORE      | C   | ROLISS        | D | RUSCO         | C   | SAMPSON       | B   |
| REDDING    | D   | RICKS         | A   | ROLLA         | C | RUSE          | D   | SANSIL        | D   |
| REDFIELD   | B   | RICREST       | B   | ROLLIN        | D | RUSH          | C   | SAN ANDREAS   | C   |
| RED HILL   | C   | RIDD          | C   | ROLCHF        | C | RUSHTOWN      | A   | SAN ANTON     | B   |
| RED HOOK   | C   | RIDGEBURY     | C   | RUMBO         | C | RUSHVILLE     | C   | SAN ANTONIO   | C   |
| REDLAKE    | D   | RIDGECREST    | C   | ROMEO         | C | RUSS          | B   | SAN ARCADIO   | B   |
| REDLANDS   | B   | RIDGEVALE     | B   | ROMNEY        | C | RUSSELL       | B   | SAN BENITO    | B   |
| REDMANSON  | B   | RIDGELAND     | D   | ROMULUS       | D | RUSSELLVILLE  | C   | SANCHAZ       | D   |
| REDMOND    | C   | RIDGELAWN     | A   | ROND          | D | RUSSLER       | C   | SANDALL       | C   |
| REDNUN     | C   | RIDGELY       | B   | ROANEY        | B | RUSTON        | B   | SANDERSON     | B   |
| REDOLA     | B   | RIDGEVILLE    | B   | ROASON        | B | RUTLAND       | C   | SANCLARE      | D   |
| REDONA     | B   | RIDGEMAY      | D   | ROSACH        | C | RUTLEGE       | D   | SANCLAY       | A   |
| REDRIDGE   | B   | RIETBROCK     | C   | ROSAPAD       | C | RYAN          | B   | SANELI        | D   |
| REDROB     | B   | RIFFE         | B   | ROSANE        | C | RYAN PARK     | C   | SAN EMIGDIO   | B   |
| RED ROCK   | B   | RIFLE         | A/D | ROSAIC        | C | RYDE          | B/D | SANGER        | B   |
| RED SPUR   | B   | RIGA          | D   | ROSCOE        | D | RYDER         | C   | SAN GERMAN    | D   |
| REDSTOE    | B   | RIGGINS       | A   | RUSCCMCN      | D | RYEGATE       | B   | SANGO         | C   |
| REDTHAYNE  | B   | RILEY         | C   | ROSEBERRY     | B | RYEPATCH      | D   | SANGREY       | A   |
| REDTOM     | C   | RILLA         | A   | ROSELCCP      | D | RYER          | C   | SANILAC       | C   |
| REDVALE    | C   | RILLITO       | B   | ROSEBUD       | B | RYUS          | C   | SAN ISABEL    | B   |
| REDVIEW    | C   | RIMER         | C   | ROSEBURG      | B | SABANA        | D   | SAN JOAQUIN   | D   |
| REE        | B   | RIMINI        | A   | ROSE CREEK    | C | SABANA SECA   | D   | SAN JOE       | C   |
| REED       | C   | RIMROCK       | D   | ROSEGLAN      | B | SABENYO       | B   | SAN JOSE      | B   |
| KEEDER     | B   | RIN           | B   | ROSEMILL      | D | SABINA        | C   | SAN JUAN      | A   |
| REEDPOINT  | C   | RINGON        | C   | ROSELAND      | D | SABINE        | A   | SAN LUIS      | B   |
| REFDY      | C   | RINGOMADA     | C   | ROSELM        | D | SABINE        | A   | SAN PATEO     | C   |
| REELFOOT   | C   | RINGLING      | C   | ROSEMOUNT     | B | SABLE         | D   | SAN MIGUEL    | C   |
| REESER     | C   | RINGG         | D   | ROSENDALE     | B | SAC           | B   | SANPETE       | A   |
| REESVILLE  | C   | RINGGLD       | B   | ROSEVILLE     | B | SACO          | C   | SANPITCH      | C   |
| HEFUGE     | C   | RINGWOOD      | B   | ROSEWORTH     | C | SACRAMENTO    | C/D | SAN POIL      | B   |
| REGAN      | B   | RIO           | D   | ROSHS SPRINGS | C | SACUL         | D   | SAN SABA      | D   |
| REGENT     | C   | RIC ARIBA     | D   | ROSSITAS      | A | SADDLE        | B   | SAN SEBASTIAN | B   |
| REHM       | C   | RIO GRANDE    | B   | ROSLYN        | B | SADDELEBACK   | B   | SANTA         | C   |
| REICHEL    | B   | RIO KING      | C   | ROSMAN        | B | SADIE         | B   | SANTA CLARA   | C   |
| REIFF      | B   | RIO LAJAS     | A   | ROSSNEY       | C | SADLER        | C   | SANTA FE      | D   |
| REILLY     | A   | RIO PIEDRAS   | B   | ROSS          | B | SAPPELL       | B   | SANTA ISABEL  | D   |
| REINACH    | B   | RIPLEY        | B   | ROSS FCRK     | C | SAGANING      | D   | SANTA LUCIA   | C   |
| RELAN      | A   | RIPON         | B   | ROSSI         | C | SAGE          | D   | SANTA MARTA   | C   |
| RELAY      | B   | RIRIE         | B   | ROSSMOCYNE    | C | SAGEMILL      | B   | SANTANA       | C   |
| RFLIANCE   | C   | RISTA         | C   | ROSS VALLEY   | C | SAGEMOOD      | C   | SANTAQUIN     | A   |
| RELIZ      | D   | RISUE         | D   | ROSTAN        | C | SAGERTON      | C   | SANTA YNEZ    | C   |
| NELSE      | B   | RITCHEY       | B   | ROTHMAY       | B | SAGINAW       | B   | SANTEE        | D   |
| REMBERT    | D   | RITNER        | C   | ROTHSAY       | B | SAGE          | D   | SANTIAGO      | B   |
| REMIT      | A   | RITTER        | B   | ROUBIDEAU     | C | SAGOUSPE      | C   | SANTIAP       | C   |
| REMSEN     | D   | RITTMAN       | C   | ROUEN         | C | SAGUACHE      | A   | SAN TIMOTEO   | C   |
| REMUAR     | B   | RITZAC        | B   | ROUNO BUTTE   | D | SAMALI        | B   | SANTONI       | D   |
| REMUNDA    | C   | RITZVILLE     | B   | ROUNTOP       | G | SAINT ALBANS  | B   | SANTOS        | C   |
| RENFELB    | D   | RIVERHEAD     | B   | ROUNTOP       | C | SAINT CHARLES | B   | SANTO THMAS   | B   |
| RENO       | D   | RIVERSIDE     | A   | ROUNY         | C | SAINT CLAIR   | D   | SAN YSIDRO    | D   |
| RENOHILL   | C   | RIVERTON      | B   | ROUSSEAU      | A | SAINT ELMO    | A   | SAPP          | D   |
| RENOVA     | B   | RIVERVIEW     | B   | ROULTON       | D | SAINT GEORGE  | C   | SAPPHIRE      | B   |
| RENOX      | B   | RIVRA         | A   | ROULTON       | D | SAINT HELENS  | A   | SAPPINGTON    | B   |
| RENSHAW    | B   | RIXIE         | C   | ROVAL         | D | SAINT IGNACE  | C   | SARA          | C   |
| RENSLOW    | B   | RIZ           | D   | ROWE          | D | SAINT JOE     | B   | SARALEGUI     | B   |
| RENSSELAER | C   | ROANCKE       | C   | ROWENA        | D | SAINT JCPNS   | B/D | SARANAC       | C   |
| KENTIDE    | C   | ROBBINS       | B   | ROWLAND       | C | SAINT LUCIE   | A   | SARAPH        | D   |
| RENTON     | B/C | ROBBS         | D   | ROWLEY        | B | SAINT MARTIN  | C   | SARATOGA      | B   |
| KENTSAC    | C   | ROBERTS       | D   | ROXBURY       | B | SAINT MARYS   | B   | SARCO         | B   |
| REPARADA   | D   | ROBERTSDALE   | C   | ROY           | B | SAINT NICHLAS | C   | SARDINIA      | C   |
| REPPART    | B   | ROBERTSVILLE  | D   | ROYAL         | B | SAINT PAUL    | B   | SARGEANT      | D   |
| REPUBLIC   | C   | ROBIN         | B   | ROYALTON      | C | SAINT THOMAS  | D   | SARITA        | A   |
| RESCUF     | B   | ROBINSON      | D   | ROYSTONE      | B | SALADU        | B   | SARKAR        | D   |
| RESERVF    | B   | ROBINSONVILLE | B   | PCZA          | D | SALAL         | D   | SARPY         | A   |
| KESNEP     | B   | ROBLED        | D   | ROZELLVILLE   | B | SALAMATOF     | C   | SARTELL       | A   |
| HET        | B/C | ROB HOY       | C   | ROZETTA       | B | SALAS         | C   | SASKA         | B   |
| RETRIEVER  | D   | ROBY          | C   | ROZLEE        | C | SALCHAKET     | B   | SASSAFRAS     | B   |
| RETSOF     | C   | ROCKE         | C   | ROZLARK       | C | SALCO         | C   | SASSER        | B   |
| RETSUK     | B   | ROCKELLE      | C   | ROZLERN       | A | SALCOBURG     | B   | SATANKA       | C   |
| REXBURG    | B   | ROCKEPORT     | C   | RUBIN         | C | SALGA         | C   | SATANTA       | B   |
| REXCR      | A   | ROCKAWAY      | C   | RUBY          | B | SALIDA        | A   | SATELLITE     | C   |
| REYES      | C/D | ROCKCASTLE    | D   | RUCH          | B | SALINAS       | C   | SATT          | D   |
| REYNOLDS   | B   | ROCK CREEK    | D   | RUCKLES       | D | SALISBURY     | D   | SATILEY       | B   |
| REYNOSA    | B   | ROCKFORD      | B   | RUCKLICK      | C | SALTI         | B   | SATTRE        | B   |
| REYAT      | D   | ROCKINGHAM    | C/D | RUCD          | D | SALKUM        | C   | SATLUS        | B   |
| RHAME      | B   | ROCKLIN       | C   | RUEEN         | B | SALLISAN      | B   | SAUGE         | B   |
| RHINEBECK  | D   | ROCKPORT      | C   | RUGLEPH       | C | SALLYANN      | C   | SAUGATUCK     | C   |

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Table C-1--Continued

|              |     |              |     |              |     |              |     |               |     |
|--------------|-----|--------------|-----|--------------|-----|--------------|-----|---------------|-----|
| SAUGUS       | B   | SELFRIDGE    | C   | SEPOLON      | B   | SKIYCU       | B   | SPARTA        | A   |
| SAUK         | B   | SELKIRK      | D   | SHIFF        | C   | SKOKCMISH    | B/C | SPEARFISH     | B   |
| SAULICH      | D   | SELLE        | B   | SHIPPON      | B   | SKOGKUMCHUCK | B   | SPEARVILLE    | C   |
| SAUM         | C   | SELLERS      | A/D | SHIRK        | B   | SKGNHEGAN    | B   | SPECK         | D   |
| SAUNDERS     | C   | SELMA        | B   | SHOALS       | C   | SKULL CREEK  | D   | SPECTER       | D   |
| SAUVIE       | C/D | SEMIAMMOO    | C   | SHOEFLER     | B   | SKUMFAH      | G   | SPEELYAI      | C   |
| SAUVULA      | C   | SEMINMOO     | D   | SHONIN       | D   | SKUTUM       | C   | SPEIGLE       | B   |
| SAVAGE       | C   | SEMIARIO     | D   | SHODI        | A   | SKYBERG      | C   | SPENARC       | C   |
| SAVANNAH     | C   | SEN          | B   | SHOFWEDD     | C   | SKYHAVEN     | D   | SPENCER       | B   |
| SAVY         | C   | SENECAVILLE  | C   | SHOFY        | B   | SKYKCHISH    | B   | SPERRY        | C   |
| SAVITA       | B   | SECATZCHIE   | B   | SHOFY        | B   | SKYLINE      | C   | SPICER        | C   |
| SAWABT       | D   | SEGUIM       | A   | SHOFT CREEK  | D   | SKYWAY       | B   | SPILLVILLE    | B   |
| SAWATCH      | C   | SEUGUIA      | C   | SHOFSHORE    | D   | SLAB         | B   | SPINKS        | A   |
| SAWCREEK     | B   | SERENE       | D   | SHOMWELL     | D   | SLATE CREEK  | C   | SPIRIT        | B   |
| SAWMILL      | C   | SERNA        | D   | SHOONS       | B   | SLAUGHTER    | C   | SPIPO         | B   |
| SAWYER       | C   | SEROCCO      | A   | SHOCALTER    | C   | SLAVEN       | C   | SPLENDORA     | C   |
| SAXBY        | D   | SERPA        | C/D | SHOILLM      | C   | SLANSON      | B   | SPLITROCK     | D   |
| SAXGN        | B   | SERVCS       | D   | SHONSURBY    | D   | SLAYTON      | C   | SPGFFORD      | C   |
| SAYBROOK     | B   | SESAME       | C   | SHORINE      | B   | SLEETH       | C   | SPOKANE       | B   |
| SAYLESVILLE  | C   | SESPE        | C   | SHRUTS       | D   | SLETTEN      | D   | SPONSELLER    | B   |
| SCALA        | B   | SESSIONS     | C   | SHUBTA       | C   | SLICKROCK    | B   | SPOON BUTTE   | D   |
| SCAMMAN      | C   | SESSUM       | D   | SHUE         | B   | SLIGHTS      | G   | SPOCNER       | C   |
| SCANDIA      | B   | SETTERS      | C   | SHULSBURG    | C   | SLIGG        | B   | SPOTTSWOOD    | B   |
| SCANTIC      | C   | SETTLEMAYER  | D   | SHUNAWAY     | D   | SLIKOK       | D   | SPRAGUE       | B/C |
| SCAR         | A   | SEVERN       | B   | SHUPERT      | C   | SLIP         | B   | SPRECKELS     | C   |
| SCARHORN     | D   | SEVILLE      | D   | SHWAM        | B   | SLCAN        | C   | SPRING        | C/D |
| SCAVE        | C   | SEVY         | C   | SI           | B   | SLOCUM       | B   | SPRING CREEK  | C   |
| SCHAFFENAKER | A   | SEWARD       | B   | SIELEYVILLE  | B   | SLODLC       | C   | SPRINGDALE    | B   |
| SCHAMBER     | A   | SEWELL       | B   | SIRYLEE      | D   | SLOSS        | C   | SPRINGER      | B   |
| SCHAMP       | C   | SEXTON       | D   | SICILY       | B   | SLUICE       | B   | SPRINGERVILLE | D   |
| SCHAPVILLE   | C   | SEYMOUR      | C   | SICKLESTEETS | C   | SMARTS       | B   | SPRINGFIELD   | D   |
| SCHEBLY      | D   | SHAAK        | D   | SIVELL       | B   | SMITH CREEK  | A   | SPRINGMEYER   | C   |
| SCHERRAPD    | D   | SHADELAND    | C   | SIVELL       | B   | SMITHACK     | B   | SPRINGTOWN    | C   |
| SCHLEY       | B   | SHAFFER      | A   | SIEBER       | A   | SMITHCN      | D   | SPUR          | B   |
| SCHMORHUSH   | C   | SHAKOPEE     | C   | SIELC        | C   | SMGLAN       | C   | SPURLOCK      | B   |
| SCHODACK     | C   | SHALCAR      | D   | SIEROCLIFF   | D   | SHOCT        | D   | SQUALICUM     | B   |
| SCHODSON     | C   | SHAM         | D   | SIERRA       | B   | SNAG         | B   | SQUAN         | B   |
| SCHOFIELD    | B   | SHAMBO       | B   | S'ERRAVILLE  | B   | SNACPMISH    | B   | SQUILLCHUCK   | B   |
| SCHMARIE     | C   | SHAMEL       | B   | S'ESTA       | D   | SNAKE        | C   | SQUIM         | B   |
| SCHOLLE      | C   | SHANAHAN     | B   | S'FTCN       | B   | SNAKE HOLLOW | B   | SQUIRES       | B   |
| SCHOOLEY     | C/D | SHANDON      | C   | S'GNAL       | D   | SNAKELUM     | B   | STAATSBURG    | B   |
| SCHRIER      | B   | SHANE        | D   | SIGURD       | B   | SNEAD        | D   | STABLER       | D   |
| SCHROOK      | B   | SHANO        | B   | SKESTON      | D   | SNELL        | C   | STACY         | B   |
| SCHUMACHER   | B   | SHANTA       | B   | SILCCX       | B   | SNELLING     | B   | STADY         | B   |
| SCHUYLKILL   | B   | SHAPLEIGH    | C/D | SILENT       | D   | SNONCMISH    | D   | STAFFORD      | C   |
| SCIC         | B   | SHARATIN     | B   | SILER        | B   | SNOQUALMIE   | B   | STACECOACH    | B   |
| SCIOTOVILLE  | C   | SHARKEY      | D   | SILERTON     | B   | SNOW         | B   | STAHL         | C   |
| SCISM        | B   | SHARDN       | B   | SILLI        | D   | SNOWDEN      | C   | STALEY        | C   |
| SCITUATE     | C   | SHARPSBURG   | B   | SILVER       | D   | SNOWLIN      | D   | STAPBAUGH     | B   |
| SCOBAY       | C   | SHARVANA     | C   | SILVERBOB    | D   | SNOWVILLE    | D   | STAPFORD      | D   |
| SCOOTENY     | B   | SHASKIT      | B/C | SILVER CREEK | D   | SNOWY        | A   | STAPPEDE      | D   |
| SCORUP       | C   | SHASTA       | A   | SILVERTON    | C   | SOAP LAKE    | B   | STAN          | B   |
| SCOTT        | D   | SHAYANO      | B   | SILVIES      | D   | SOBOBA       | A   | STANDISH      | C/D |
| SCOTT LAKE   | B   | SHAYEN       | B   | SIMAS        | C   | SOBRANTE     | C   | STANEY        | D   |
| SCIUT        | A   | SHAWANO      | A   | SIMCOE       | C   | SODA LAKE    | B   | STANFIELD     | C   |
| SCOWALE      | C   | SHAWMUT      | B   | SIMECH       | A   | SODHOUSE     | B   | STANLEY       | C   |
| SCRANTON     | B/D | SHAY         | D   | SIPPLER      | A   | SODUS        | C   | STANSBURY     | D   |
| SCRIBA       | C   | SHEAR        | C   | SIPAER       | A   | SCELBERG     | B   | STANTON       | D   |
| SCRIVER      | B   | SHECKLER     | C   | SIPCA        | C   | SOFIA        | C   | STAPLETON     | B   |
| SCROGGIN     | C   | SHEDD        | C   | SIPCNA       | B   | SGGN         | D   | STARBUCK      | D   |
| SCULLIN      | C   | SHEEGE       | D   | SIPPERS      | B   | SOGZIE       | B   | STARICKHOF    | D   |
| SEABROOK     | A   | SHEEP CREEK  | C   | SIPPCSN      | C   | SOLANG       | D   | STARKS        | B   |
| SEAMAN       | C   | SHEEPHEAD    | C   | SIMS         | C   | SCLDATNA     | B   | STARR         | C   |
| SEACUEST     | C   | SHEEPROCK    | A   | SINAI        | C   | SOLCER       | C   | STASER        | B   |
| SEARCLIGHT   | C   | SHEETIRON    | C   | SINCLAIR     | B   | SOL DUC      | B   | STATE         | B   |
| SEARING      | B   | SHEFFIELD    | D   | SINE         | C   | SOLLEKS      | C   | STATEN        | D   |
| SEAKLA       | B   | SHELBURNE    | C   | SINGLETREE   | D   | SOLLER       | D   | STAVE         | C   |
| SEARLES      | C   | SHELBY       | B   | SINGSAAS     | B   | SOLCPCA      | D   | STAYTON       | D   |
| SEATON       | B   | SHELBYVILLE  | B   | SINNGAM      | C   | SOLCNA       | B   | STEAMBOAT     | D   |
| SEATTLE      | D   | SHELDON      | B   | SINUK        | B   | SOMBRENO     | B   | STEARNS       | D   |
| SEBAGL       | D   | SHELIKOF     | C   | SION         | B   | SOMERS       | D   | STECUM        | A   |
| SEBASTIAN    | D   | SHELLABARGER | B   | SICUX        | A   | SCHENSET     | C   | STEED         | A   |
| SEBASTOPOL   | C   | SHELLDRAKE   | A   | SIPPLE       | A   | SOMENVELL    | B   | STEEDMAN      | D   |
| SEBEKA       | D   | SHELLROCK    | A   | SISKIYOU     | B   | SOMSEN       | C   | STEEKEE       | C   |
| SEBELA       | B/D | SHELLMADINE  | D   | SISSETCH     | B   | SCNCITA      | B   | STEELE        | B   |
| SEBREE       | D   | SHELOCTA     | B   | SISSEN       | B   | SONCPA       | C   | STEESE        | C   |
| SEBRING      | D   | SHELTON      | C   | SITES        | C   | SCNTAG       | E   | STEFF         | C   |
| SECATA       | C   | SHEFNA       | C   | SITKA        | B   | SCPER        | B   | STEGALL       | C   |
| SECRET       | C   | SHEFNANDAM   | C   | SIXPILE      | B   | SCQUEL       | B   | STEIGER       | A   |
| SECRET CREEK | B   | SHEPPARD     | A   | SIZEMORE     | B   | SORF         | C   | STEINKAUB     | B   |
| SEDAN        | D   | SHERIDAN     | B   | SIZER        | B   | SGRPENTO     | B   | STEINBECK     | D   |
| SEEGSKADEE   | D   | SHERP        | D   | SKAGGS       | B   | SCRTER       | B/D | STEINMETZ     | B   |
| SEFS         | C   | SMERRYL      | B   | SKAGIT       | B/C | SCSA         | C   | STEINSBURG    | C   |
| SEHEF        | B   | SMIBLE       | B   | SKAMA        | C   | SCTELLA      | C   | STEINER       | C   |
| SEGAL        | D   | SMIELDS      | C   | SKALAN       | C   | SOUTHFORK    | D   | STELLAR       | D   |
| SEGO         | C   | SHIFFER      | B   | SKAPANIA     | B   | SOUTHGATE    | C   | STEPILT       | C   |
| SEHORN       | D   | SHILOH       | C   | SKAPKANA     | B   | SOUTHWICK    | C   | STENDAL       | C   |
| SEJITA       | D   | SHINAKU      | C   | SKANE        | C   | SPAA         | D   | STEPHEN       | C   |
| SEKIU        | D   | SHINGLE      | D   | SKELOCK      | B   | SPACE CITY   | A   | STEPHENSBURG  | B   |
| SELAM        | C   | SHINGLETOWN  | C   | SKEERRY      | B   | SPARF        | B   | STEPHENVILLE  | B   |
| SELDEN       | C   | SHINN        | B   | SKILLET      | C   | SPALDING     | C   | STERLING      | A   |
|              |     | SHINROCK     | C   | SKINNER      | C   | SPANAWAY     | B   | STERLINGTON   | B   |

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Table C-1--Continued

|               |     |                 |     |               |     |              |     |              |     |
|---------------|-----|-----------------|-----|---------------|-----|--------------|-----|--------------|-----|
| STETSON       | B   | SUNSET          | B   | TALLAPOOSA    | C   | TENSAS       | D   | TINKEN       | D   |
| STETTER       | D   | SUNSHINE        | C   | TALLEYVILLE   | B   | TENSED       | C   | TIPPERMAN    | B   |
| STEUEN        | B   | SUNSWEEP        | C   | TALLS         | B   | TENSLEEP     | B   | TIPPONS      | B   |
| STEVENS       | B   | SUPAN           | B   | TALLULA       | B   | TEOCULLI     | B   | TIPPAMUTE    | B   |
| STEVENSON     | B   | SUPERIOR        | C   | TALLY         | B   | TEPEE        | D   | TIMPANCOGOS  | B   |
| STEWART       | D   | SUPERSTITION    | A   | TALMAGE       | A   | TEPETE       | B/D | TIMPER       | B   |
| STICKNEY      | C   | SUPERVISOR      | C   | TALMO         | B   | TERMINO      | C   | TIMPCONEKE   | B   |
| STIDHAM       | A   | SUPPLEE         | B   | TALCKA        | D   | TERMINAL     | D   | TIMULA       | B   |
| STIGLER       | C   | SUR             | B   | TALPA         | D   | TERMC        | C   | TINA         | C   |
| STILLMAN      | A   | SURGH           | B   | TAMA          | B   | TEROUGE      | D   | TINCANAY     | A   |
| STILLWATER    | D   | SURPRISE        | B   | TAMALCO       | D   | TERRA CEIA   | A/D | TINE         | A   |
| STILSON       | B   | SURRENCY        | B/D | TAMBA         | C/D | TERRAD       | D   | TINSLEY      | A   |
| STINSON       | B/C | SURVYA          | C   | TAMMANY CREEK | B   | TERAERA      | C   | TINTON       | A   |
| STINGAL       | B   | SUSIE CREEK     | D   | TAMPS         | C   | TERRIL       | B   | TINYTOWN     | B   |
| STINSON       | C   | SUSITNA         | B   | TAMFICO       | B   | TERRY        | B   | TIOGANG      | D   |
| STIRK         | D   | SUSQUEMANNA     | D   | TANAMA        | D   | TEKNTLLIGER  | C   | TIOGA        | B   |
| STIRUM        | B   | SUTHER          | C   | TANANA        | C   | TESAJC       | A   | TIPPAN       | C   |
| STISSING      | B   | SUTHERLIN       | C   | TANBERG       | C   | TESCOTT      | C   | TIPPECANOE   | B   |
| STIVERSVILLE  | B   | SUTPHEN         | D   | TANDY         | C   | TESUGUE      | B   | TIPPER       | A   |
| STOCKHIDGE    | B   | SUTTLER         | B   | TANEUM        | C   | TETON        | A   | TIPPERARY    | A   |
| STOCKLAND     | D   | SUTTON          | B   | TANEY         | C   | TETONIA      | B   | TIPPICAH     | D   |
| STOCKPEN      | B   | SVEA            | B   | TANGAIR       | C   | TETONKA      | C   | TIPPO        | C   |
| STOCKTON      | D   | SVERDRUP        | B   | TANNA         | C   | TETOTUM      | C   | TIPTON       | B   |
| STODICK       | D   | SVILD           | C   | TANNER        | C   | TEW          | B/D | TIPTONVILLE  | B   |
| STOKES        | D   | SWAGER          | C   | TANSEN        | B   | TEX          | B   | TIRA         | B   |
| STOMAR        | C   | SWAKANE         | B   | TANTALUS      | A   | TEWLINE      | B   | TISBURY      | B   |
| STONER        | B   | SWAN            | C   | TANMAR        | C   | TEZUMA       | C   | TISCH        | C   |
| STONEWALL     | A   | SWANBOY         | D   | TACOPI        | C   | THACKERY     | E   | TISH TANG    | B   |
| STONO         | B/D | SWANNER         | D   | TACS          | C   | THADER       | C   | TITUSVILLE   | C   |
| STONYFORD     | D   | SWANSON         | C   | TAPIA         | C   | THANYCN      | A   | TIVERTCN     | A   |
| STOUKEY       | B   | SWANTON         | B/D | TAPPEN        | D   | THATCHER     | B   | TIVCLE       | A   |
| STOPPEN       | B   | SWANTOWN        | C   | TARA          | B   | THATUNA      | C   | TIVY         | C   |
| STORLA        | B   | SWAPPS          | C   | TARKIC        | J   | THAYNE       | B   | TOA          | C   |
| STORM KING    | D   | SWARTSWOOD      | C   | TARKLIN       | I   | THEBES       | B   | TOBICO       | D   |
| STORY         | C   | SWARTZ          | D   | TARPC         | C   | THEBC        | D   | TOBIN        | B   |
| STOSSEL       | C   | SWASEY          | D   | TAMPANT       | C   | THEDULUND    | C   | TOBLER       | B   |
| STOUGH        | C   | SWASTIKA        | C   | TARYALL       | B   | THEMAS       | C   | TOBESA       | D   |
| STOWELL       | D   | SWATARA         | A   | TASCOSA       | B   | THERESA      | B   | TOBY         | B   |
| STOY          | D   | SWAUK           | C   | TASSEL        | D   | THERIGT      | D   | TOCCOA       | B   |
| STRAIGHT      | C   | SWAWILLIA       | A   | TATE          | B   | THEHMAE      | C   | TODD         | B   |
| STRAIN        | B   | SWEATMAN        | C   | TATIYEE       | C   | THEHMPCLIS   | D   | TODDLER      | B   |
| STRASHURG     | C   | SWEDE           | B   | TATU          | C   | THETFGRD     | A   | TODDVILLE    | B   |
| STRATFORD     | B   | SWEDEN          | B   | TATUM         | C   | THIOKCL      | C   | TOEHEAD      | C   |
| STRAUSS       | C   | SWEEN           | C   | TAUTNCS       | C   | THEOLNY      | D   | TOEJA        | C   |
| STRAW         | B   | SWEENEY         | B   | TAVARES       | A   | THOMAS       | C   | TOEP         | C   |
| STRAWN        | B   | SWEET           | C   | TAVAS         | A/D | THORNDALE    | D   | TOGC         | B   |
| STREATOR      | C   | SWEETGRASS      | B   | TAYLOR        | C   | THORNDIKE    | C/D | TOHCNA       | C   |
| STROLE        | B   | SWEETWATER      | D   | TAYLOR CREEK  | D   | THORNDCK     | D   | TOINE        | C   |
| STRONGHURST   | B   | SWENUDA         | B   | TAYLORSFLAT   | D   | THORNTON     | C   | TOIYABE      | C   |
| STRONTIA      | B   | SWIFTON         | A   | TAYLORSVILLE  | C   | THORAWOOD    | B   | TOKEEN       | C   |
| STROUPE       | D   | SWIMS           | A   | TAYSCM        | B   | THERCUGHFARE | B   | TOKUL        | B   |
| STHYKIK       | B   | SWINGLE         | D   | TAZLINA       | A   | THORP        | C   | TOLBY        | B   |
| STUKEL        | C   | SWISBOB         | D   | TEAL          | D   | THORR        | B   | TOLEDO       | D   |
| STUKY         | B   | SWITCHBACK      | C   | TEALWHIT      | C   | THORREL      | B   | TOLICHA      | D   |
| STUMBLE       | A   | SWITZERLAND     | B   | TEANAWAY      | C   | THOW         | B   | TULL         | A   |
| STUMPP        | D   | SWOPE           | C   | TEAPC         | B   | THOFFE MILE  | C   | TOLLGATE     | B   |
| STUMP SPRINGS | B   | SHYGGERT        | C   | TEAS          | C   | THUNGENBIRC  | C   | TOLLHOUSE    | D   |
| STUTTGAPT     | D   | SYCAMORE        | R   | TEASCALE      | B   | THURBER      | C   | TOLNA        | B   |
| STUTZVILLE    | B/C | SYCAN           | A   | TEBC          | B   | THURLONI     | C   | TOLC         | B   |
| SUHLETTE      | B   | SYLACAUGA       | B/C | TECHICK       | B   | THURLCN      | C   | TOLSONA      | D   |
| SUDHURY       | B   | SYLVAN          | B   | TECCCLCTE     | B   | THUMMAN      | A   | TOLSTOI      | D   |
| SUFFIELD      | C   | SYMERTON        | B   | TECUMSAH      | B   | THURMONT     | B   | TOLT         | D   |
| SUGALDAF      | B   | SYNAREP         | B   | TEPCW         | B   | THURSTON     | B   | TOLTEC       | C   |
| SUISUN        | D   | SYRACUSE        | B   | TEEL          | B   | TIAR         | C   | TOLUCA       | B   |
| SULA          | D   | SYRENE          | D   | TEHACHAPI     | D   | TIBBITTS     | B   | TOLVAN       | B   |
| SULLY         | B   | SVRETT          | C   | TEHAMA        | C   | TILA         | C   | TOMAH        | C   |
| SULPHURA      | D   |                 |     | TEJA          | D   | TICE         | D   | TOMAS        | B   |
| SULTAN        | B   | TABERNASH       | H   | TEJCN         | B   | TICHIGAN     | C   | TOWAST       | C   |
| SUMAS         | B/C | TABIONA         | H   | TEKCA         | C   | TICHANCR     | D   | TOWERA       | D   |
| SUMDUM        | D   | TABLE MCOUNTAIN | R   | TELA          | B   | TICKAPPO     | C   | TOWICHI      | A   |
| SUMMA         | B   | TABLER          | D   | TELEFCNC      | D   | TICKASUN     | B   | TOPCKA       | C   |
| SUMMERFIELD   | C   | TABCR           | E   | TELEPHONE     | D   | TIDWELL      | D   | TONATA       | C   |
| SUMMERS       | B   | TACOMA          | D   | TELEPH        | A   | TIEWRA       | C   | TGNANANCA    | C   |
| SUMMERVILLE   | C   | TACOSH          | D   | TELL          | B   | TIETCA       | B   | TONEY        | D   |
| SUMMIT        | C   | TACT            | C   | TELLER        | B   | TIFFANY      | C   | TONGUE RIVER | B   |
| SUMMITVILLE   | H   | TAGGERT         | C   | TELLICC       | B   | TIFTUN       | B   | TONINI       | B   |
| SUMTER        | C   | TAHOMA          | B   | TELLMAN       | B   | TIGER CREEK  | B   | TONKA        | C   |
| SUN           | D   | TAHQUAMENON     | D   | TELSTAD       | B   | TIGERON      | A   | TONKEY       | L   |
| SUNARHST      | C   | TAHQUATS        | D   | TEPESCAL      | D   | TIGINCN      | B   | TONKS        | B   |
| SUNBURY       | H   | TATINTOR        | C   | TEPPLE        | B/C | TIGNETT      | B   | TONCPAN      | B   |
| SUNCOOK       | A   | TAJO            | C   | TEPVK         | B   | TIGUA        | D   | TONEK        | B   |
| SUNO          | C   | TAKEUCHI        | C   | TEPABC        | D   | TIJERAS      | B   | TONSINA      | B   |
| SUNDELL       | C   | TAKILMA         | B   | TEPANA        | B   | TILFCNC      | B   | TOMCO        | B   |
| SUNDEKLAND    | C/D | TAKOTNA         | H   | TEPAS         | C   | TILLCOA      | B   | TOCLE        | D   |
| SUNDOWN       | A   | TALANTE         | C   | TEPCEE        | C   | TILLICUM     | B   | TOCPES       | U   |
| SUNFIELD      | B   | TALAPUS         | P   | TEPTRIFFE     | C   | TILLMAN      | C   | TOP          | C   |
| SUNLAND       | C   | TALROTT         | C   | TEPEX         | A   | TILMA        | C   | TOPPENISH    | B/C |
| SUNNYHAY      | D   | TALCOT          | C   | TERIAC        | B   | TILSIT       | C   | TOPTCN       |     |
| SUNNYSIDE     | B   | TALIHINA        | D   | TERINC        | B   | TILTON       | B   | TOQUERVILLE  | D   |
| SUNNYVALF     | C   | TALKEETNA       | C   | TERNL         | D   | TIMBERG      | C   | TOQUOP       | A   |
| SUNPAY        | C   | TALLAC          | B   | TEROT         | C   | TIMBERLY     | B   | TORBCY       | B   |
| SUNRISE       | C   | TALLADEGA       | C   | TERPAC        | B   | TIMENTNA     | B   | TORCHLIGHT   | C   |

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Table C-1 --Continued

|               |     |               |     |              |     |              |   |             |     |
|---------------|-----|---------------|-----|--------------|-----|--------------|---|-------------|-----|
| TORHUNTA      | C   | TRUCKEE       | C   | UKIAH        | C   | VASHTI       | C | VGLINTA     | B   |
| TORNING       | B   | TRUCKTON      | B   | ULEN         | B   | VASQUEZ      | B | VOLKE       | C   |
| TORODA        | B   | TRUESDALE     | C   | ULLOA        | B   | VASSAR       | B | VOLKMAR     | B   |
| TORONTO       | C   | TRULL         | C   | ULM          | B   | VASTINE      | C | VOLNEY      | B   |
| TORPEDO LAKE  | C   | TRULON        | B   | ULRICHER     | B   | VAUCLUSE     | C | VOLPERIE    | C   |
| TORREON       | C   | TRUMAN        | B   | ULUPALAKUA   | B   | VAUGHNSVILLE | C | VOLTAIRE    | C   |
| TORRES        | B   | TRUMBULL      | D   | ULYSSES      | B   | VAYAS        | D | VOLUSTIA    | C   |
| TORRINGTON    | B   | TRUMP         | D   | UMA          | A   | VEAL         | B | VONA        | B   |
| TORRC         | C   | TRYON         | D   | UMAPINE      | B/C | VEAZIE       | B | VORE        | B   |
| TORTUGAS      | D   | TSCHICOMA     | C   | UMIKCA       | B   | VEBAR        | B | VRCCHAN     | B   |
| TOTEM         | B   | TUB           | C   | UMIL         | D   | VEBAR        | B | VULCAN      | C   |
| TOTTEN        | B   | TUBAC         | C   | UMNAK        | B   | VEGA         | C | VYLACH      | D   |
| TOUCHET       | B   | TUCANNON      | C   | UPPA         | B   | VEGA ALTA    | C |             |     |
| TOUHEY        | B   | TUCKERMAN     | D   | UNA          | D   | VEGA BAJA    | D | WABANTCA    | D   |
| TOULON        | B   | TUCUNCARI     | C   | UNACILLA     | B   | VEKOL        | C | WABASH      | D   |
| TOURN         | C   | TUFFIT        | D   | UNANEEP      | B   | VELMA        | B | WABASHA     | D   |
| TOLRNOUIST    | B   | TUGHILL       | D   | UNCCMPAGHRE  | C   | VELVA        | B | WABASSA     | B/D |
| TOURS         | B   | TUJUNGA       | A   | UNEEDA       | B   | VENA         | B | WABEK       | B   |
| TOUTLE        | A   | TUKEY         | C   | UNGERS       | B   | VENANGO      | C | WACA        | C   |
| TOWER         | D   | TURWILA       | D   | UNICH        | C   | VENATOR      | D | WACCTA      | B   |
| TOWNER        | B   | TULA          | C   | UNIONTOWN    | B   | VENETA       | C | WACCUSTA    | C   |
| TOWNLEY       | C   | TULANA        | C/D | UNIONVILLE   | C   | VENEZIA      | D | WADAMS      | B   |
| TOWNSBURY     | B   | TULARE        | C/D | UNISCN       | C   | VERICE       | D | WADCELL     | B   |
| TOWNSEND      | C   | TULAROSA      | C   | UPSAL        | C   | VENLC        | D | WADCOUPS    | B   |
| TOWSON        | B   | TULIA         | B   | UPSHUR       | C   | VENUS        | B | WADENA      | B   |
| TOXAWAY       | D   | TULLER        | D   | UPTON        | C   | VERBCORT     | D | WADESBORO   | B   |
| TOY           | D   | TULLOCK       | B   | URACCA       | B   | VERDE        | C | WADLEIGH    | C   |
| TOYAH         | B   | TULLY         | C   | URBANA       | C   | VERDEL       | D | WADPALAW    | D   |
| TOZE          | B   | TUMBEZ        | D   | URBC         | D   | VERDELLA     | D | WADSWORTH   | C   |
| TRABUCO       | C   | TUMES         | D   | URICH        | D   | VERDIGRIS    | E | WAGES       | B   |
| TRACK         | B   | TUMITAS       | B   | URNE         | B   | VERDUN       | D | WAGNER      | D   |
| TRACY         | B   | TUMWATER      | A   | URSINE       | C   | VERGENNES    | C | WAGRAP      | A   |
| TRAEER        | C   | TUNEHEAN      | D   | URTAH        | C   | VERHALEN     | C | WAMA        | C   |
| TRAIL         | A   | TUNICA        | D   | URWIL        | D   | VERMEJC      | G | WAMEE       | D   |
| TRAIL CREEK   | B   | TUNIS         | D   | USAL         | B   | VERNAL       | B | WAMIAMA     | B   |
| TRANSYLVANIA  | B   | TUNKHANMOCK   | A   | USHAR        | B   | VERNALIS     | B | WAMIKULI    | B   |
| TRAPPER       | A   | TUNNEL        | B   | USINE        | D   | VERNON       | D | WANKEENA    | B   |
| TRAPPIST      | C   | TUPELO        | C   | USKA         | B   | VERONA       | C | WANHIACUS   | B   |
| TRASK         | C   | TUPUKNUK      | D   | UTALINE      | B   | VESSER       | C | WANLUKE     | B   |
| TRAVER        | B/C | TURBEVILLE    | C   | UTE          | C   | VESTON       | C | WANPETON    | C   |
| TRAVESSILLA   | D   | TURBCTVILLE   | C   | UTICA        | A   | VETAL        | A | WANPTIGUP   | B   |
| TRAVIS        | C   | TURBYFILL     | B   | UTLEY        | B   | VETERAN      | B | WANTUM      | B/C |
| TRAWICK       | B   | TURIN         | B   | UTUAGO       | B   | VEYC         | D | WAIAMA      | D   |
| TRAY          | C   | TURK          | D   | UVACA        | D   | VIA          | B | WAIAROA     | C   |
| TREADWAY      | D   | TURKEYSPRINGS | C   | UVALDE       | C   | VIAN         | B | WAIALEALE   | D   |
| TREASURE      | B   | TURLEY        | C   | UWALA        | B   | VIBOHAS      | D | WAIALUA     | B   |
| TREBLOC       | D   | TURLIN        | B   |              |     | VIBORG       | B | WAIANA      | D   |
| TREGO         | C   | TURNBOW       | C   | VACHERIE     | C   | VICKERY      | C | WAIHUNA     | D   |
| TRELONA       | D   | TURNER        | B   | VADER        | B   | VICKSBURG    | B | WAIKALCA    | B   |
| TREMLES       | B   | TURNERVILLE   | B   | VACC         | A   | VICTOR       | A | WAIKANE     | B   |
| TREMPE        | A   | TURNNEY       | B   | VAIDEN       | D   | VICTORIA     | C | WAIKAPU     | B   |
| TREMPEALEAU   | B   | TURRET        | B   | VAILTON      | B   | VICTORY      | B | WAIKONG     | D   |
| TRENARY       | B   | TURRIA        | C   | VALCC        | C   | VICU         | C | WAILUKU     | B   |
| TRENT         | B   | TUSCAN        | D   | VALCEZ       | B/C | VIDA         | B | WAIPEA      | B   |
| TRENTON       | D   | TUSCARAMAS    | C   | VALE         | B   | VIDRINE      | C | WAINEE      | E   |
| TREP          | B   | TUSCARORA     | C   | VALENCIA     | B   | VIENNA       | B | WAINCLA     | A   |
| TRES HERMANOS | C   | TUSCGLA       | B   | VALENT       | A   | VIEQUES      | B | WAIIPAMU    | C   |
| TRES HERMANOS | C   | TUSCUMBIA     | C   | VALENTINE    | A   | VIEU         | C | WAIISKA     | B   |
| TRETTEN       | C   | TUSEL         | C   | VALFPA       | C   | VIGAR        | C | WAIIS       | B   |
| TREVINC       | D   | TUSREEGO      | C   | VALKARIA     | B/D | VIGO         | D | WAKE        | D   |
| TREXLER       | C   | TUSLER        | B   | VALLAN       | D   | VIKING       | D | WAKEEN      | B   |
| TRIAMI        | C   | TUSQUITEE     | B   | VALLECITCS   | C   | VIL          | C | WAKEFIELD   | B   |
| TRIASSIC      |     | TUSTIN        | B   | VALLERS      | C   | VILAS        | A | WAKELAND    | B/D |
| TRICON        | C   | TUSTUMENA     | B   | VALPONT      | C   | VILLA GREVE  | B | WAKENDA     | C   |
| TRIDELL       | B   | TUTHILL       | B   | VALPY        | B   | VILLARS      | B | WALCOTT     | B   |
| TRIDENT       | D   | TUTTLE        | B   | VALCIS       | B   | VINA         | B | WALDECK     | C   |
| TRIGO         | C   | TUTWILER      | B   | VANAJC       | D   | VINCENNES    | C | WALDO       | D   |
| TRIMBLE       | B   | TUXEOD        | B   | VANANDA      | D   | VINCENT      | C | WALDRON     | D   |
| TRIMMER       | B   | TUXEKAN       | B   | VAN BUREN    | B   | VINEYARD     | C | WALDROUP    | C   |
| TRINCHERA     | C   | TWILACKS      | A   | VANCE        | C   | VINGC        | B | WALE        | C   |
| TRINITY       | D   | TWIN CREEK    | B   | VANDA        | D   | VINING       | C | WALFRD      | C   |
| TRIPLEN       | C   | TWINING       | C   | VANDALIA     | C   | VINITA       | C | WALKE       | C   |
| TRIPOLI       | C   | TWISP         | B   | VANDERDASSON | D   | VINLAND      | C | WALL        | B   |
| TRIPP         | B   | TWO DOT       | C   | VANDERGRIFT  | C   | VINTON       | B | WALLACE     | B   |
| TRITON        | C   | TYEE          | D   | VANDERHOFF   | D   | VIRA         | C | WALLA WALLA | B   |
| TRIX          | B   | TYGART        | D   | VANDERLIP    | A   | VINATON      | C | WALLER      | B/D |
| TROJAN        | B   | TYLER         | D   | VAN DUSEN    | B   | VIRDEN       | C | WALLINGTON  | C   |
| TRUMMOLD      | D   | TYNDALL       | B/C | VANET        | C   | VIRGIL       | B | WALLIS      | B   |
| TROMP         | B/C | TYNER         | A   | VANG         | B   | VIRGIN PEAK  | D | WALLKILL    | C/D |
| TROENSEN      | B   | TYRONE        | C   | VANHORN      | B   | VIRGIN RIVER | D | WALLMAN     | C   |
| TROOK         | B   | TYSON         | C   | VAN NCSTERN  | B   | VIRTUE       | E | WALLONA     | C   |
| TROPAL        | D   | UBAR          | C   | VANNCY       | B   | VISALIA      | B | WALLPACK    | C   |
| TROSI         | D   | UBLY          | C   | VANUSS       | B   | VISTA        | C | WALLROCK    | B   |
| TROUP         | A   | UCCLA         | C   | VANTAGE      | C   | VIVES        | B | WALLSBURG   | D   |
| TROUT CREEK   | C   | UCCLA         | B   | VAN WAGNER   | D   | VIVI         | B | WALLSSON    | B   |
| TROUTDALE     | B   | UCCLPIA       | B   | VARCO        | C   | VLASATY      | B | WALLSOLE    | C   |
| TROUT LAKE    | C   | UDEL          | D   | VARELUM      | C   | VCCA         | C | WALSH       | B   |
| TROUT RIVER   | A   | UGOLPHO       | C   | VARICK       | D   | VCDERPAIER   | B | WALSHVILLE  | D   |
| TROUTVILLE    | B   | UFFENS        | D   | VARINA       | C   | VCLADCHA     | B | WALSTERS    | A   |
| TROTEL        | B   | UGAK          | D   | VARNA        | C   | VCLFTE       | C | WALTON      | C   |
| TROY          | C   | UHLIG         | H   | VAHRC        | B   | VGLGA        | D | WALLP       | B   |
| TRUCE         | C   | UANTA         | B   | VARYSBURG    | B   | VOLIN        | B | WALVAN      | B   |

NOTES: A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED. TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/IMPAIRED SITUATION.



Table C-1--Continued

|               |     |              |     |               |     |              |     |               |     |
|---------------|-----|--------------|-----|---------------|-----|--------------|-----|---------------|-----|
| WAMPA         | B/C | WEMADKEE     | D   | WHITNEY       | B   | WINU         | C   | YAMPA         | C   |
| WAMIC         | B   | WEIKERT      | C/D | WHITORE       | A   | WINZ         | C   | YAMSAY        | D   |
| WAMPSVILLE    | B   | WEIMER       | D   | WHITSL        | B   | WIOTA        | B   | YANA          | B   |
| WANATAM       | B   | WEINBACH     | C   | WHITSON       | D   | WISMEYLU     | C   | YAQUINA       | B/D |
| WANBLEE       | D   | WEIR         | D   | WHITWELL      | C   | WISKAM       | C   | YARDLEY       | C   |
| WANUJ         | A   | WEIRMAN      | B   | WHCLAN        | C   | WISNER       | D   | YATES         | D   |
| WANETTA       | A   | WEISER       | C   | WIBAUX        | D   | WITBECK      | D   | YANCIN        | C   |
| WANN          | A   | WEISHAUPT    | C   | WICHITA       | C   | WITCH        | D   | YANKEY        | C   |
| WANA          | A   | WEISS        | A   | WICHUP        | D   | WITHAM       | D   | YAXON         | B   |
| WAPAL         | B   | WEITCHEPEC   | B   | WICKERSHAM    | B   | WITHEE       | C   | YEATES HOLLOW | C   |
| WAPATI        | C/D | WELRY        | B   | WICKETT       | C   | WITT         | C   | YEGEN         | B   |
| WAPPELLC      | B   | WELCH        | C   | WICKHAM       | B   | WITZEL       | C   | YELP          | B   |
| WAPINITIA     | R   | WELD         | C   | WICKIUP       | C   | WIDEN        | B   | YENRAB        | A   |
| WAPPIAS       | B   | WELDA        | C   | WICKLIFFE     | C   | WIDSKOW      | B   | YEPAN         | B   |
| WAPUSIC       | B   | WELDON       | C   | WICKSBURG     | B   | WILCCTYSBURG | B   | YETULL        | A   |
| WAPMA         | B   | WELDONA      | J   | WIDTSGE       | C   | WOLDALE      | C/D | YODER         | B   |
| WAND          | D   | WELLER       | C   | WIEM          | C   | WOLF         | B   | YOKCHL        | C   |
| WANDORRO      | A   | WELLENHORN   | C   | WIEN          | D   | WOLFESEN     | C   | YOLLABCLLY    | D   |
| WANDOLL       | D   | WELLINGTON   | D   | WIGGLETON     | B   | WOLFCRD      | B   | YOLC          | B   |
| WANDON        | B   | WELLMAN      | B   | WILBRAMAP     | C   | WOLFP POINT  | B   | YOLCGO        | D   |
| WANDWELL      | C   | WELLNER      | B   | WILBUR        | C   | WOLFFEVER    | C   | YCMCNT        | B   |
| WANE          | B   | WELLSBORD    | C   | WILCC         | C   | WOLVERINE    | A   | YONCALLA      | C   |
| WANEHAY       | C   | WELLSTON     | B   | WILCCX        | D   | WOODBINE     | B   | YONGES        | B   |
| WANEHAN       | D   | WELLSVILLE   | B   | WILCCXSCN     | C   | WOODBRIDGE   | C   | YONNA         | B/D |
| WANEY SPRINGS | C   | WEMPLE       | B   | WILDCAT       | D   | WOODBURN     | D   | YORCY         | B   |
| WAPNERS       | A/D | WENAS        | B/C | WILDER        | B   | WOODBURY     | D   | YORK          | C   |
| WAPREN        | B   | WENATCHEE    | C   | WILDERNESS    | C   | WOODCLOCK    | B   | YORKVILLE     | D   |
| WAPRENTON     | B/D | WENDEL       | B/C | WILDROSE      | D   | WOODENVILLE  | C   | YOST          | C   |
| WAPRICK       | B   | WENMAN       | D   | WILCROCC      | D   | WOODGLEN     | D   | YOUGA         | B   |
| WAPSAW        | B   | WENONA       | C   | WILEY         | C   | WOODHURST    | A   | YOUPAN        | C   |
| WAPRING       | B   | WENTWORTH    | B   | WILKES        | C   | WOODLY       | B   | YOUNGSTON     | B   |
| WAPRICK       | A   | WENNER       | B   | WILKESGN      | C   | WOODLYN      | C   | YOURAME       | A   |
| WAPATCH       | A   | WESU         | C   | WILKINS       | D   | WOODMANSIE   | B   | YOUVIMPA      | D   |
| WASEPI        | B   | WESSEL       | B   | WILL          | D   | WOODMERE     | D   | YSIDORA       | C   |
| WASHURN       | B   | WESTBROOK    | D   | WILLACY       | B   | WOODRIVER    | C   | YTURBIDE      | A   |
| WASHINGTON    | B   | WESTBURY     | C   | WILLAKENZIE   | C   | WOODROCK     | B   | YUBA          | D   |
| WASHME        | C   | WESTCREEK    | B   | WILLAMAP      | D   | WOODROW      | B   | YUKGN         | D   |
| WASHJUGAL     | D   | WESTENVILLE  | C   | WILLAPETTE    | B   | WOODS CROSS  | C   | YUNES         | D   |
| WASHTENAW     | C/F | WESTFALL     | C   | WILLAPA       | C   | WOODSFIELD   | C   | YUNQUE        | C   |
| WASHILLIA     | C   | WESTFIELD    | C   | WILLARD       | C   | WOODSIDE     | A   |               |     |
| WASHIJA       | C   | WESTFORD     | B/D | WILLETTE      | A/D | WOODSON      | D   | ZAAZ          | D   |
| WASSAIC       | B   | WESTLAND     | B/D | WILLHAND      | B   | WOODSTGCK    | C/D | ZACA          | C   |
| WATAG         | C   | WESTMINSTER  | C/D | WILLIAMS      | B   | WOODSTOWN    | C   | ZACHARIAS     | B   |
| WATANGA       | B   | WESTMORE     | B   | WILLIAMSBURG  | B   | WOODWARD     | B   | ZACHARY       | D   |
| WATAMANG      | B   | WESTMORELAND | B   | WILLIAMSON    | C   | WOODMAN      | B   | ZAFRA         | B   |
| WATAMUNG      | D   | WESTON       | D   | WILLIS        | C   | WOODLPER     | C   | ZAMILL        | B   |
| WATERBORD     | D   | WESTPHALIA   | B   | WILLITS       | B   | WOODSEY      | C   | ZAMH          | B   |
| WATERURY      | D   | WESTPLAIN    | C   | WILLUGHBY     | B   | WOODSLEY     | B   | ZALESKI       | C   |
| WATERIN       | C   | WESTPORT     | A   | WILLCUM CREEK | B   | WOODSTER     | C   | ZALLA         | C   |
| WATERX        | C   | WESTVILLE    | D   | WILLGWDALE    | B   | WOODSTERN    | B   | ZAMORA        | B   |
| WATAINS       | B   | WETHERSFIELD | C   | WILLGWS       | D   | WOODTEN      | A   | ZANE          | C   |
| WATKINS RIDGE | B   | WETHEY       | B/C | WILLWCCD      | A   | MORCESTER    | B   | ZANEIS        | B   |
| WATOPA        | B   | WETZEL       | D   | WILMER        | C   | WOLF         | D   | ZANESVILLE    | C   |
| WATRUS        | B   | WEYMOUTH     | B   | WILPAR        | D   | WOKK         | C   | ZANONE        | C   |
| WATSEKA       | C   | WYALAN       | B   | WILSON        | D   | WORLDAND     | B   | ZAPATA        | C   |
| WATSON        | C   | WYARTON      | C   | WILTSHIRE     | C   | WORLEY       | C   | ZAVALA        | B   |
| WATSONIA      | D   | WHATCOM      | C   | WINARS        | B/C | WORMSER      | C   | ZAVCO         | C   |
| WATSONVILLE   | D   | WHATELY      | D   | WINCHESTER    | A   | WROCK        | B   | ZEB           | B   |
| WATT          | D   | WHEATLEY     | C   | WINCHUCK      | C   | WRSHAM       | D   | ZESSEX        | C   |
| WATTJN        | C   | WHEATRIDGE   | C   | WINDER        | B/D | WORTH        | C   | ZELL          | B   |
| WAUBAY        | B   | WHEATVILLE   | B   | WINDMILL      | B   | WORTHEN      | B   | ZEN           | C   |
| WAUBEEK       | B   | WHEELER      | B   | WINDGM        | B   | WORTHING     | D   | ZENCA         | C   |
| WAUSDNIE      | B   | WHEELING     | B   | WIND RIVER    | B   | WORTHINGTON  | C   | ZENIA         | B   |
| WAUCHULA      | B/D | WHEELOCK     | C   | WINDSOR       | A   | WORTHMAN     | C   | ZENIFF        | B   |
| WAUCOMA       | B   | WHEELON      | D   | WINDYTHORST   | C   | WRENTHAM     | C   | ZECNA         | A   |
| WAUCONDA      | R   | WHELCHL      | B   | WINDY         | C   | WRIGHT       | C   | ZIEGLER       | C   |
| WAUKEF        | B   | WHETSTONE    | B   | WINEG         | B   | WRIGHTSVILLE | D   | ZIGLID        | B   |
| WAUKEGAN      | B   | WHIDBEY      | B   | WINEMA        | C   | WUNJEY       | B   | ZILLAH        | B/C |
| WAUKENA       | D   | WHIPPANY     | C   | WINETTI       | B   | WURTSBURG    | C   | ZIM           | D   |
| WAUKON        | B   | WHIPSTOCK    | C   | WINFIELD      | C   | WYALUSING    | D   | ZIMMERMAN     | A   |
| WAUWER        | B   | WHIRLO       | C   | WING          | D   | WYARD        | B   | ZING          | C   |
| WAUPIKA       | D   | WHIT         | B   | WINGATE       | B   | WYARNG       | C   | ZINZER        | B   |
| WAUSEDN       | B/D | WHITAKER     | C   | WINGER        | C   | WYATT        | C   | ZION          | C   |
| WAVFLY        | D/D | WHITCOMB     | C   | WINGVILLE     | B/D | WYEAST       | C   | ZIPP          | C/D |
| WAWAKA        | C   | WHITE BIRD   | C   | WINIFRED      | C   | WYEVILLE     | C   | ZITA          | B   |
| WAWCUP        | B   | WHITECAP     | D   | WINK          | B   | WYGANT       | B   | ZOAR          | C   |
| WAWDEN        | D   | WHITEFISH    | B   | WINKLEMAN     | C   | WYOFF        | B   | ZOHNER        | B/D |
| WAWLAND       | C/D | WHITEFORD    | B   | WINLO         | D   | WYMAN        | B   | ZOOK          | C   |
| WAWNE         | B   | WHITEHORSE   | C   | WINLOCK       | C   | WYORE        | C   | ZORRAVISTA    | A   |
| WAWNESBORD    | B   | WHITE HOUSE  | B   | WINN          | C   | WYRN         | B   | ZUFELT        | B   |
| WAWYSIDE      | B   | WHITELAKE    | B   | WINNEBAGO     | B   | WYROCSE      | D   | ZUMBRO        | B   |
| WBA           | B   | WHITELAW     | B   | WINNEPUCCA    | B   | WYO          | B   | ZUMWALT       | C   |
| WBAVEP        | C   | WHITENAM     | D   | WINNESHEK     | B   | WYOCENA      | B   | ZUNDELL       | B   |
| WBAR          | C   | WHITEROCK    | D   | WINNETT       | D   |              |     | ZUNHALL       | B   |
| WBER          | B   | WHITESBURG   | C   | WINONA        | D   | YACOLT       | B   | ZUNI          | C   |
| WEBSTER       | C   | WHITE STORE  | D   | WINOOSKI      | B   | YAHARA       | B   | ZURICH        | B   |
| WEDGE         | A   | WHITE SWAN   | C   | WINSTON       | A   | YAHOLA       | B   |               |     |
| WEDWEE        | R   | WHITENATER   | B   | WINTERS       | C   | YAKIPA       | B   |               |     |
| WEDO          | C   | WHITENWOOD   | C   | WINTERSBURG   | B   | YAKUS        | D   |               |     |
| WEEFING       | A   | WHITLEY      | B   | WINTERSSET    | C   | YALLANI      | B   |               |     |
| WEEHARK       | B   | WHITLOCK     | B   | WINTHROP      | A   | YALNER       | B   |               |     |
| WEELSVILLE    | B/D | WHITMAN      | D   | WINTGNER      | C   | YARHILL      | C   |               |     |

NOTES A BLANK HYDROLOGIC SOIL GROUP INDICATES THE SOIL GROUP HAS NOT BEEN DETERMINED TWO SOIL GROUPS SUCH AS B/C INDICATES THE DRAINED/UNDRAINED SITUATION

## BIBLIOGRAPHY

1. Modern Sewer Design, American Iron and Steel Institute, First Edition, 1980.
2. National Clay Pipe Institute, "Gravity Flow Hydraulics Calculator"
3. Standard Handbook for Civil Engineers, McGrawHill, Second Edition 1976.
4. Technical Release No. 55, Urban Hydrology for Small Watersheds, Soil Conservation Services, January, 1975.
5. Texas Instruments, TI99/4A Personal Computer, User's Handbook, First Edition, 1983.
6. Introduction to Linear and Nonlinear Programming, by David G. Luenberger, Addison-Wesley Publishing Company, Inc., 1973.
7. National Engineering Handbook, Section 4, Soil Conservation Service August, 1972.
8. A Computer Program for the Minimum Cost Design of a Sewer System, Civil Engineering Thesis, Number 1348, Youngstown State University.