Pennsylvania State University
Soil Characterization Laboratory Database System

by

Edward J. Ciolkosz and Nelson C. Thurman[1]

Agronomy Series Number 124

Agronomy Department
The Pennsylvania State University
University Park, PA 16802

October 1992

[1] Professor of Soil Genesis and Morphology and Soil Characterization Laboratory Director, 116 Agricultural Sciences and Industries Building, The Pennsylvania State University, University Park, PA 16802. Telephone: (814) 865-1530; Fax: (814) 863-7043.

CONTENTS

INTRODUCTION 1

STARTING THE PROGRAM 2

DATA ENTRY 2
- A. Data Entry Screen Features 5
  - 1. Top entry screen menu 5
  - 2. Selecting pedons 5
  - 3. Switching entry screens 5
  - 4. Paging through the entry screens 5
  - 5. Moving through screen lines and data fields 7
  - 6. Entering data 7
  - 7. Exiting the system 7
- B. Site Data 7
  - 1. Entering new site data 7
  - 2. Editing existing site data 8
  - 3. Deleting a site record 8
- C. Horizon Data 9
  - 1. Adding new horizons 9
  - 2. Entering new horizon data 9
  - 3. Editing existing horizon data 10
  - 4. Deleting horizon records 10
- D. Lab and Lab Input Data 10

DATA OUTPUT 11
- A. Data Tables (Narrative Reports) 11
  - 1. Narrative reports for individual pedons 11
  - 2. Narrative reports by soil series 11
  - 3. Narrative reports by county 13
  - 4. Narrative reports from data entry screen top menus 13
- B. Data Output to Disk 13

SYSTEM SETUP 16

CODE FILES 16

APPENDIX 20
- A. Site and Horizon Codes and Forms 20
  - 1. Site codes 20
  - 2. Site form 29
  - 3. Horizon codes and forms 30
- B. Structure and Description Files for the Pedon Program 38
  - 1. Site Data 38
  - 2. Horizon Data 41
  - 3. Laboratory 45
    - (a) Laboratory Data 45
    - (b) Laboratory Input 47
- C. Laboratory Data Input Forms 49
- D. Site, Horizon, Physical and Chemical Data Tables for Pedon 014-099 56

Acknowledgement

The computer database system program was developed by Star-Dot-Star Consulting, 230 Armagast Road, Bellefonte, PA 16823.

INTRODUCTION

The Penn State University Soil Characterization Laboratory Database System is PC-based, uses Clipper-compiled dBase language, and runs from DOS. The system requires 2 megabytes of disk space and runs on 640K RAM memory. With the 800 pedons of Pennsylvania data, the system plus data takes up 13 megabytes of disk space. The dBase data management program is not necessary to run the system; but if available, it can also be used to manage the files. Figure 1 gives a schematic of the system. The system is menu-driven and very user-friendly.

The characterization database system uses the USDA Soil Conservation Service (SCS) field data forms and pedon coding system in the site and horizon data files. Field data codes and raw laboratory data are interactively entered (see Appendix A for codes and forms). The system includes a calculation program that converts the raw laboratory data to the final data and automatically enters it into the database (Figure 1).

A service database with a structure identical to the soil characterization database is included in the system to handle any data that is not to be included in the soil characterization database. Except where noted, the commands for the characterization and the service databases are identical.

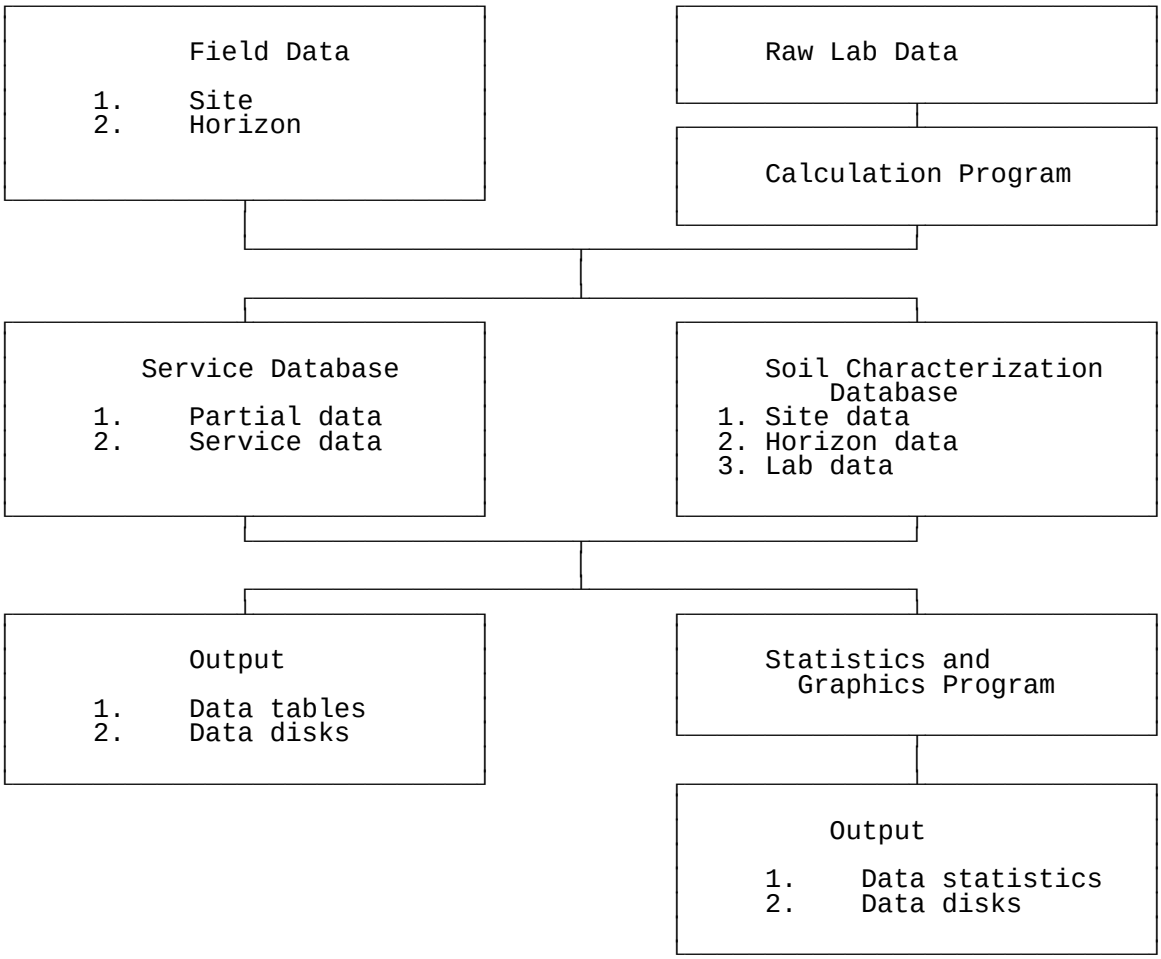

Figure 1. Schematic diagram of the Penn State Soil Characterization Laboratory database system.

STARTING THE PROGRAM

If you have not installed the program on your computer, refer to the installation instructions that accompany the program disks. To start the program, enter the drive that contains the program. The following start-up commands assume that the program is located in the PEDON directory on the C drive:

C:\> cd \Pedon <enter>
C:\pedon> menu <enter>

The system comes up on the screen with a password window (Figure 2). Type the password and press <enter>. You may also access the system by pressing <enter> without a password, but you will not be able to edit or enter data.

The main system menu (Figure 3) that follows the password window lists the following selections:

(1) Soil Characterization Data and Service Data
  (a) add, edit, delete or view data;
  (b) export data to another file;
  (c) send a narrative report to a printer or another file.

(2) Code Files -- edit data codes.

(3) System Defaults -- change the printer defaults.

(4) Quit -- exit the system and return to DOS.

Use the up and down cursor arrows to move the highlight bar to the desired menu item and press <enter> to select the option.

DATA ENTRY

Use the cursor keys to highlight the "Soil Characterization Data" option on the main system menu and press <enter>. The soil characterization data menu will appear on the screen (Figure 4). Highlight "Site, Horizon & Laboratory Data" and press <enter>.

The data entry (site, horizon, lab, and lab input) submenu (Figure 5) provides access to four entry screen files (Site, Horizon, Lab, and Inputlab), each with a series of screens or pages (note that labinput and inputlab are used as identical terms in the system). The data screen and corresponding internal data files within the system are as follows: Site - Sitedata; Horizon - Horidata; Lab - Labdata; and Inputlab - Labinput. Any file can also be accessed from the screen top menu of the entry screens (Figure 6).

Use the cursor keys to highlight the desired screen selection and press <enter> to open the screen and data files. The "Narrative Report" selection on the submenu (Figure 5) will be discussed later. "Quit" returns to the main (or previous) menu. The Quit selection can be made in one of the following three ways from any menu:

(1) Use the cursor keys to highlight "Quit" on the menu and press <enter>;

(2) Type the letter "Q";

(3) Press the <esc> key.

These commands will back you out of most screens and situations.

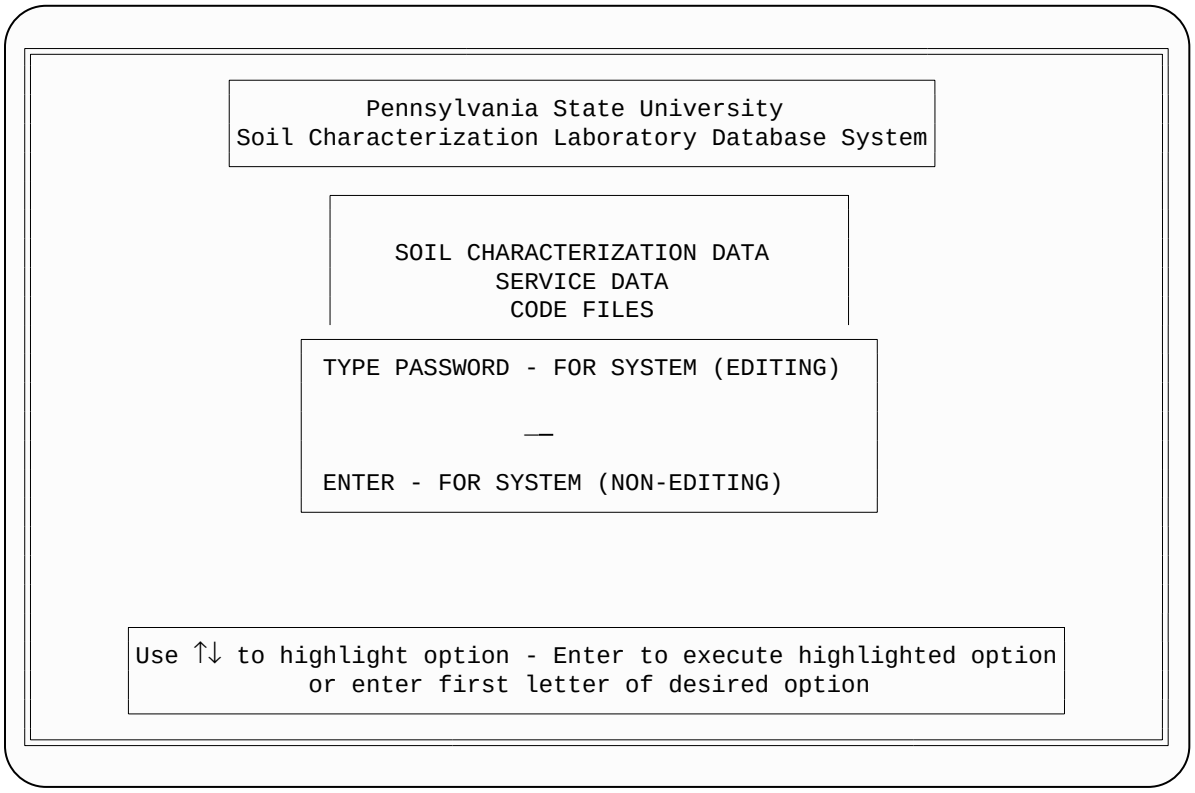

Figure 2. Password window screen for the database system

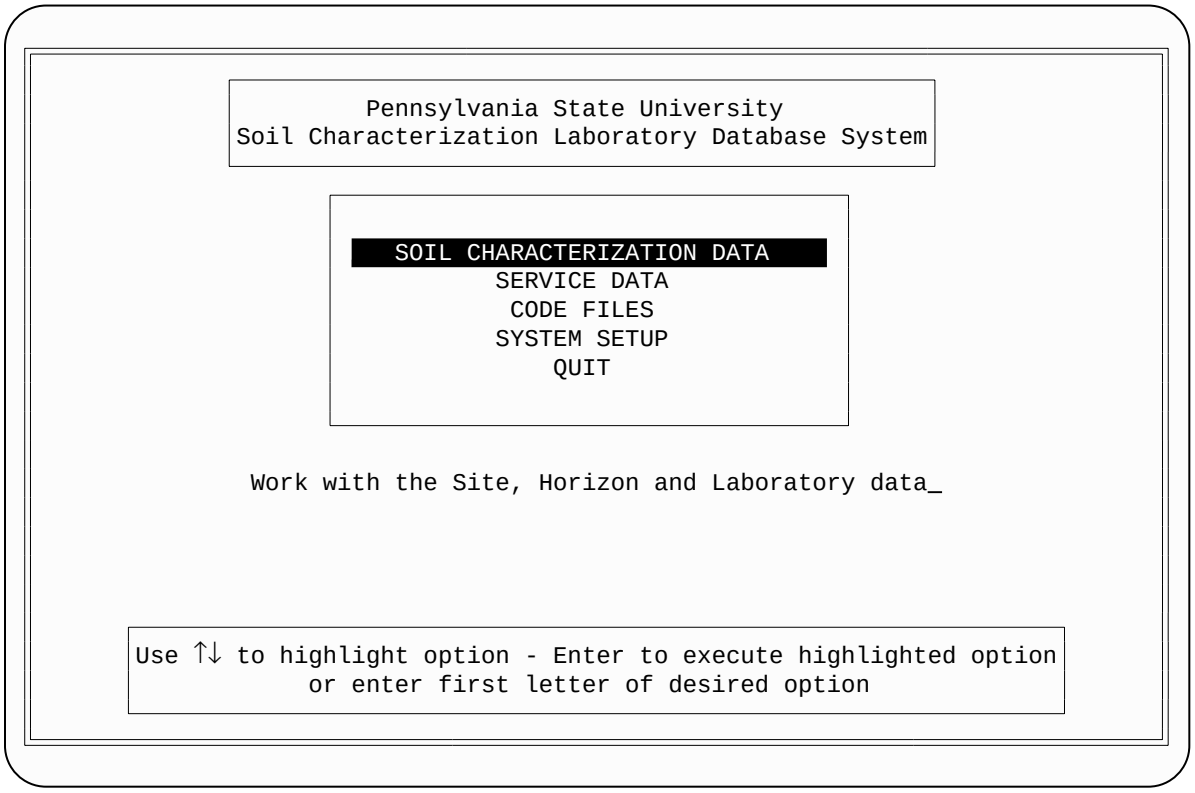

Figure 3. Main system menu screen for the database system

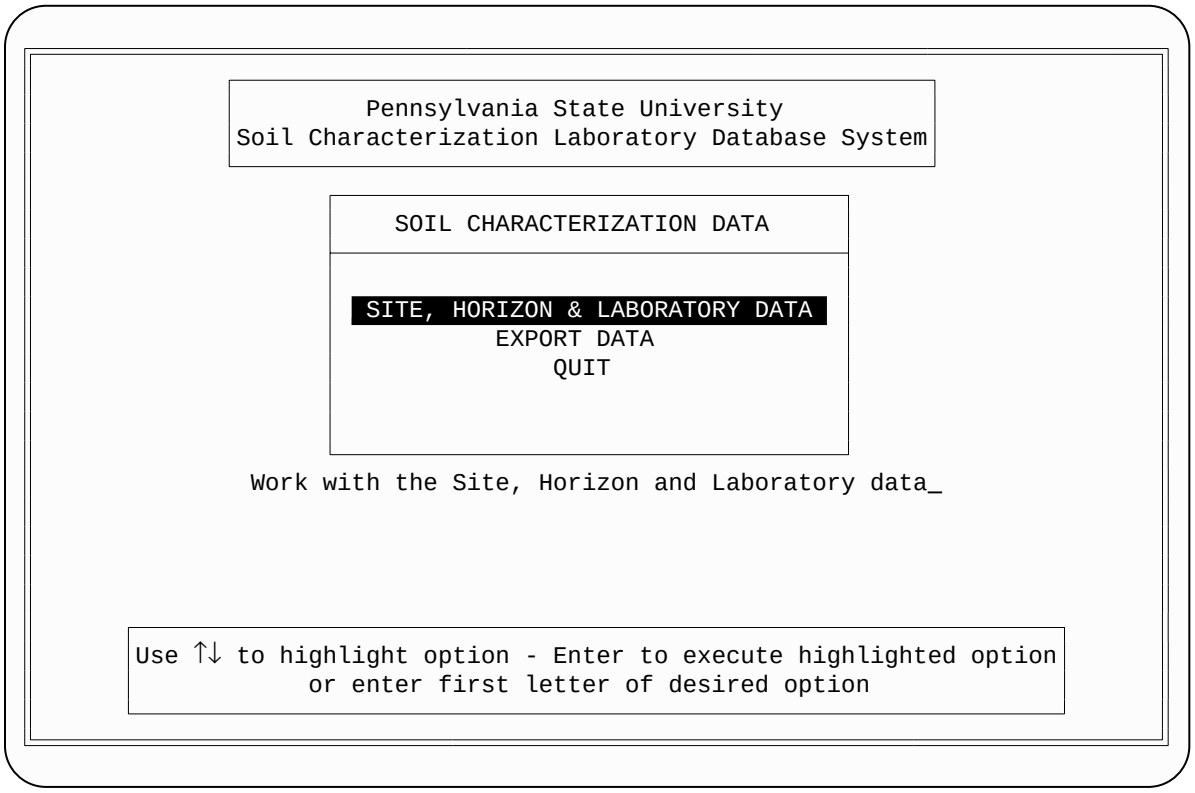

Figure 4. Soil characterization data menu screen for the database system

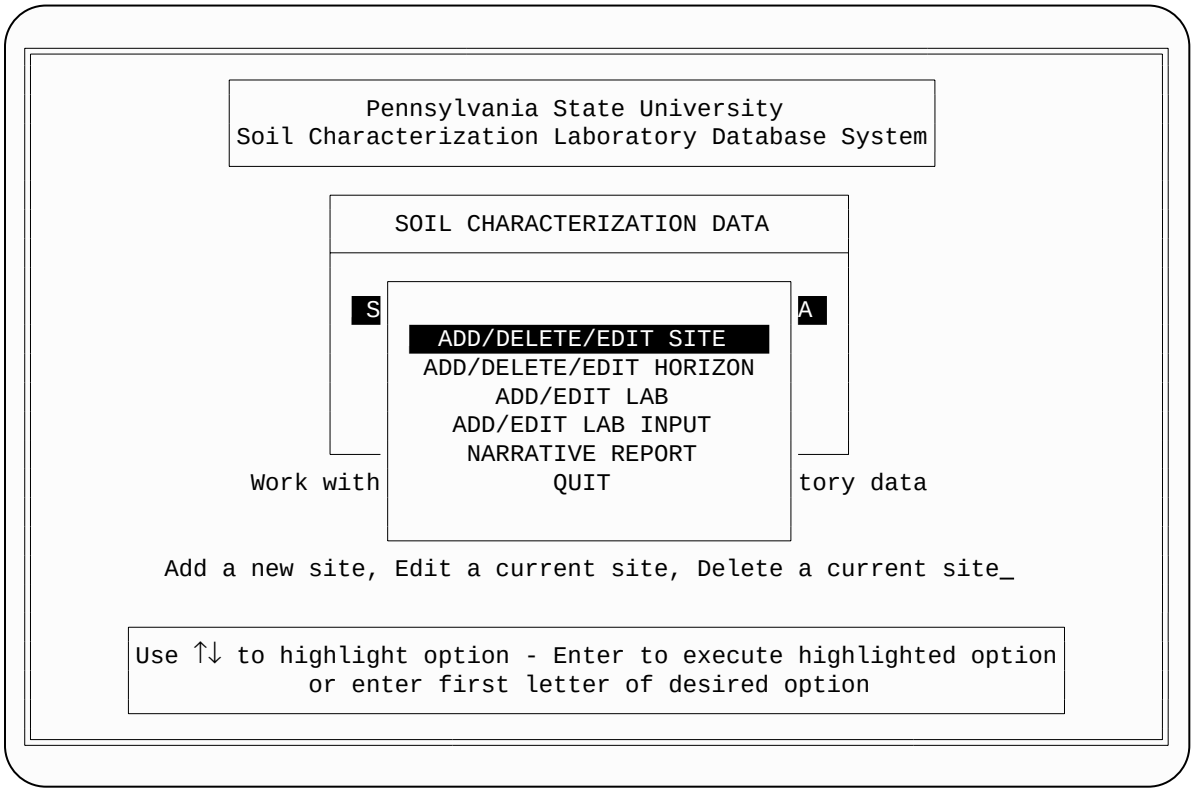

Figure 5. Data entry (site, horizion, lab, and lab input) and narrative report submenu screen for the database system

A. Data Entry Screen Features

To enter, edit, or view data in the characterization database, highlight one of the "Add/Delete/Edit" selections (site, horizon, lab, lab input) on the menu and press <enter>. The data entry screens for site (shown in Figure 6), horizon, lab, and lab input have certain common features. Menu features and conventions for selecting pedons, switching entry screens, moving through screen pages, data lines and fields, and exiting the systems are described below.

1. Top entry screen menu

The entry screen menu is displayed across the top of the entry screen, beginning in the upper left corner. A brief description of the menu option appears underneath the menu on the left side of the screen. Two methods to select menu options are available:

a. Use the cursor arrow keys to highlight the desired menu selection and press <enter>.

b. Press the key for the first letter of the menu item. For example, press the "A" key to select "Add."

2. Selecting pedons

Pedon information (series name, pedon unit identification, number of horizons) is displayed on the right side of the screen, immediately below the menu line. The menu offers three ways to select a pedon:

a. **Goto** displays a pedon selection screen (Figure 7). Move the highlight bar to the desired pedon and press <enter>. The up and down cursor arrows move one pedon at a time; <page up> and <page down> keys move one screen page at a time; <home> moves to the top of the list; and <end> moves to the bottom of the list.
Press <Alt> and "O" keys at the same time to change the sort order from pedon identification number to alphabetical soil series name.

b. **Next** moves forward to the next pedon, or site, in the database listing (pedons are sorted by the State-County-Pedon Identification number).

c. **Prev** (Previous) moves backward to the preceding pedon, or site, in the database listing.

3. Switching entry screens

Any data entry screen/ file can be accessed from the screen top menu of any other entry screen. Move the highlight to the desired entry screen name and press <enter> or simply type the first letter of the name (S for site, H for horizon, L for lab, I for input lab).

4. Paging through the entry screens

Site consists of 2 screen pages; Horizon has 4 pages; Lab has 5 pages; and Inputlab has 7 pages. Each screen page corresponds to a data form page (see Appendix A). The screen page number appears in the upper right corner of the screen. Use <Ctrl> plus <Page Up> and <Ctrl> plus <Page Down> to move forward or back one entry page.

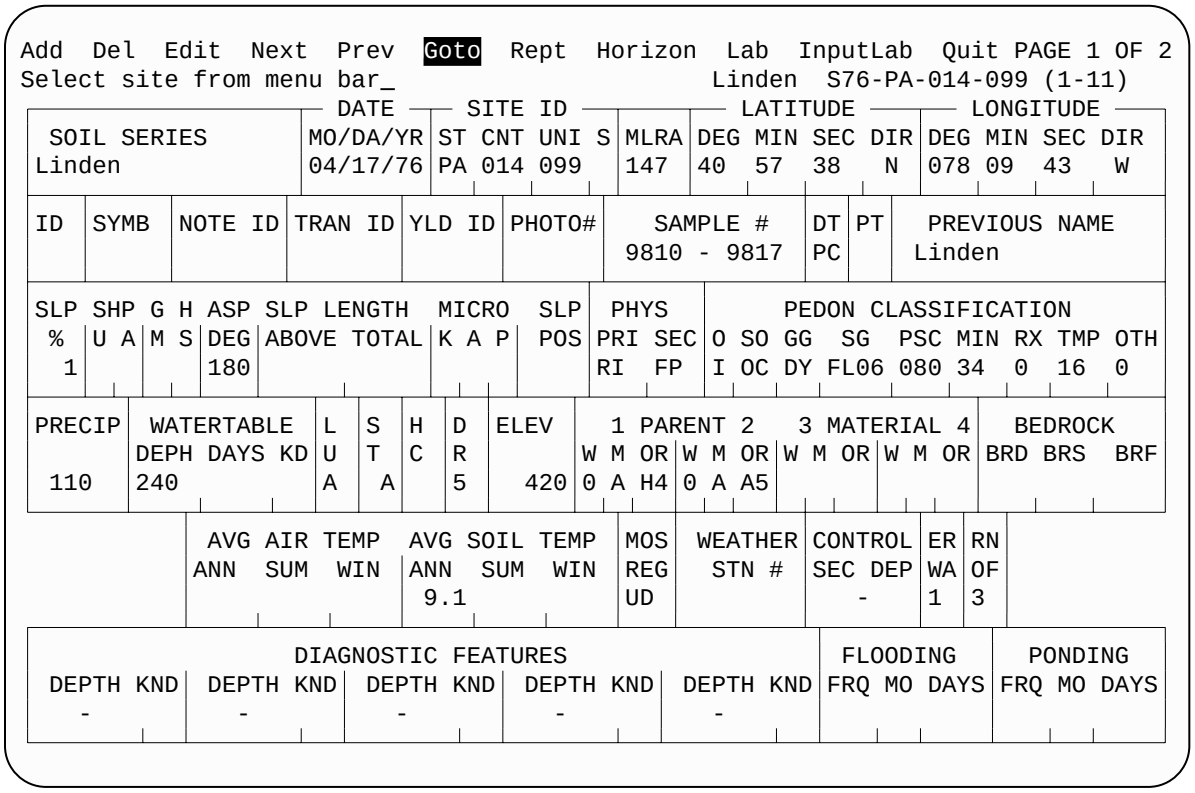

Figure 6. First page (screen) of the site entry form.

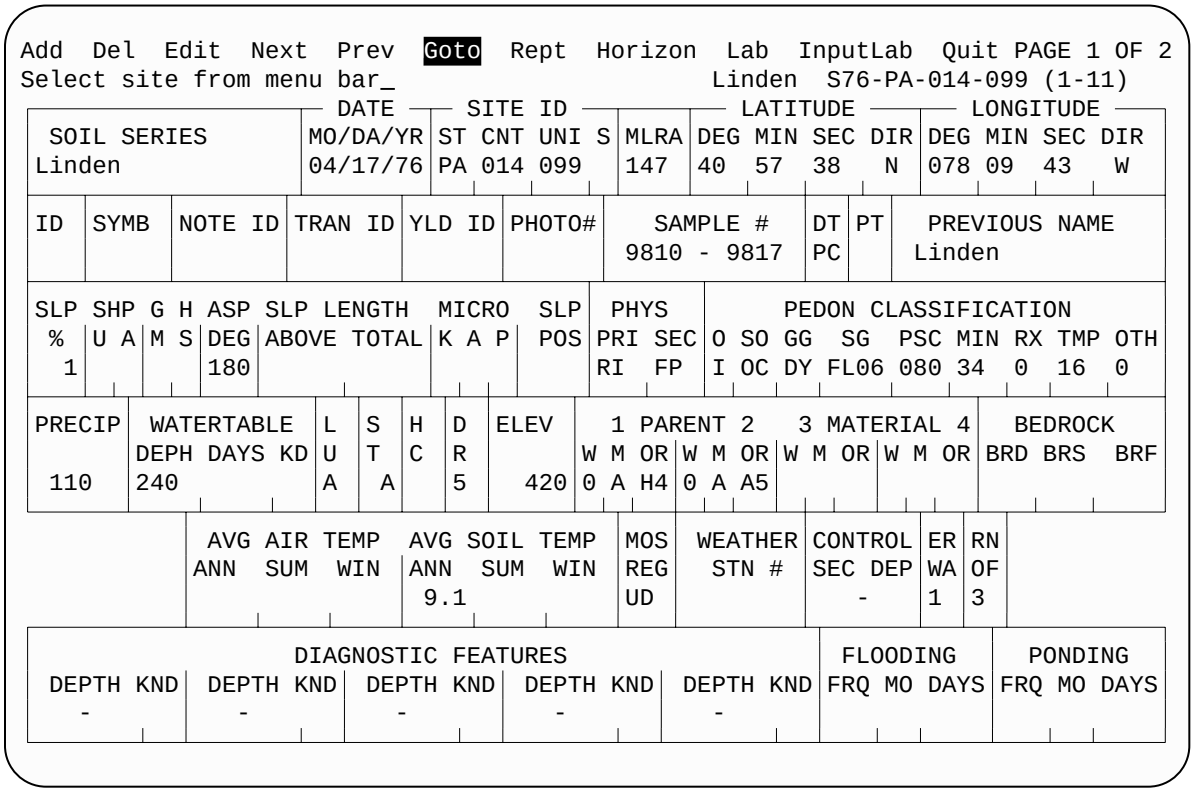

Figure 7. Pedon selection menu screen using the Goto option.

5. Moving through screen lines and data fields

a. Use the <Page Up> and <Page Down> keys to move from one line to another on the entry screen.

b. Use the <Home> key to move to the upper left field on a page and the <End> key to move to the lower right field on a page.

c. Use the <Ctrl> plus left or right arrow keys to move laterally between the main data entry fields.

d. Use the up arrow key to move right and the down arrow key to move left in a field such as LATITUDE that has more than one selection bar.

e. Use the left and right arrow keys to move the cursor within a selection bar field.

6. Entering data

a. Left justify all data entry.

b. Put leading zero's (0's) in the following fields:
(1) Date (01/01/91)
(2) Site (PA 001 001)
(3) Latitude and longitude (39 56 02) (077 16 39)

c. Enter data around decimals (.) and dashes (-). Also enter the . and -.

d. Use <Ctrl> plus <End> keys to record data. At the "Save these changes?" prompt, choose "Yes" or "No" and press <enter>. This will return you to the screen top menu.

7. Exiting the system

The <Esc> key allows you to exit or back out of most situations. From the top screen menu, select "Quit" to return to the previous menu screen.

B. Site Data

Select "Add/Delete/Edit Site" from the data entry and narrative report submenu (Figure 5) to add a new site, delete an existing site, or enter and edit site characteristics data. The site codes and a site data form are provided in Appendix A (A.1 - Site Codes; A.2 - Site Form).

1. Entering new site data

Select "Add" from the screen top menu (Figure 6). A cursor will appear in the SITE ID field. SITE ID, SOIL SERIES, and DATE (mo/da/yr) must be entered before the site record will be saved to a file. The remaining site data can be entered at the same time or at a later time.

a. SITE ID: Type the state abbreviation under ST (PA comes up automatically; type another state code over this or move to CNT with the down arrow key). Enter a county number (001, 027, etc.) under CNT, and the site number (001, 137, etc.) under UNI. The S can be used to make a subdivision of the site, e.g., two or more pedons out of the same soil pit or site. For most sites, S will be left blank. If a mistake is made in the SITE ID, press <Esc> and start over. Once entered, the SITE ID cannot be edited. Press <enter> to move to the next field.

b. SOIL SERIES: For the soil characterization database a pick-list of soil series names will appear on the screen. Select a name from the list or add a new name in the space provided. To select a name on the pick-list, use the cursor arrow keys to highlight the name and press <enter>. To add a new name, press <enter> with the selection bar on the "add new series name" field. Type the new name in the blank field and press <enter>. Capitalize only the first letter of the SOIL SERIES name. The series pick-list does not appear for the service database. Instead, the cursor highlights the SOIL SERIES field. Enter the series or service name and press <enter>.

c. Once the soil series name is entered, the cursor bar moves to DATE. Enter in which the pedon was described and sampled. After the date is entered, the remaining site data can be entered. Use capital letters for codes. Use the Sitecode file (Appendix A.1) for the correct codes and the S & D (Structure & Description) Sitedata file (Appendix B.1) for an additional explanation of the codes.

d. Once the data is entered, press <Ctrl> plus <End> to save the site data and return to the top screen menu.

2. Editing existing site data

a. Use the "Goto" option on the top menu screen to select the site/pedon to be edited (see section A.2 - Selecting Pedons).

b. The data on file for the selected site will appear on the screen. Select "Edit" from the top screen menu (section A.1). A cursor will appear in the SOIL SERIES field. Move the cursor to the desired data fields (see sections A.4 and A.5) and enter data (section A.6) by typing over the existing data.

3. Deleting a site record

The entire site/pedon record (including site, horizon, lab, and lab input data) can be deleted from the site entry screen.

a. Use the "Goto" option on the top menu screen to select the site/pedon to be deleted (see section A.2 - Selecting Pedons).

b. The site data for the pedon to be deleted will appear on the screen. Select "Delete" from the top screen menu (section A.1). At the prompt "Do you really want to delete this site?" select "Yes." The site and associated horizon, lab, and lab input records will be deleted from the database and the cursor will return to the top screen menu.

C. Horizon Data

Select "Add/Delete/Edit Horizon" from the data entry and narrative report submenu (Figure 5) to add horizons to an existing site, enter and edit horizon characteristics data, or delete

a horizon record. The horizon codes and horizon data forms are provided in Appendix A.3. The S & D (Structure & Description) Horidata file (Appendix B.2) provides an additional explanation of the codes.

1. Adding new horizons

Before adding new horizons or entering horizon data for a new pedon, the SITE ID, DATE, and SOIL SERIES name must first be added to the Sitedata file (see section B.1). This will add these data to the Goto listing. Once this has been done, enter the Horizon entry screen from the Site top screen menu (see section A.1) or by selecting "Add/Delete/Edit Horizon" from the main menu (Figure 5).

a. **Add new horizons** to a site by selecting "Modify" from the screen top menu. A new screen top menu will appear. Move the selection bar to "Append" and press <enter>. Add as many horizons as required by pressing <enter> for each horizon. The number of horizons (e.g., 1-10) entered will be added automatically to the Sitedata file.

b. **Save the newly added horizons** by selecting "Quit" from the "Modify" screen menu. At the prompt "Save these changes?" select "Yes" and the new horizon records will be saved to file.

2. Entering new horizon data

Enter new horizon data by selecting "Modify" from the top screen menu. When the new screen top menu appears, move the selection bar to "Edit" and press <enter>. A cursor will appear in the first horizon data field. Refer to sections A.4 and A.5 for cursor movement commands and to section A.6 for data entry conventions. In addition, the following data entry conventions will apply:

a. Use the <Alt> plus H keys to enter data horizontally across the screen and <Alt> plus V to enter data vertically down the screen.

b. Use all capital letters except for Horizon Sufx (suffix) and free form notes.

c. For horizons in which a primary structure parts to a secondary structure (e.g., prismatic parting to subangular blocky), enter the primary structure shape (SHP) first, using capitalized letters. Use small case letters for the second structure shape to indicate that the first (primary) structure parts to the second structure.

d. When two structures are found in a horizon (e.g., subangular blocky and prismatic) use capital letters for both structure shapes.

e. Use the first rock fragment entry field to enter the kind (KD) and total quantity (percent) of rock fragments in the horizon. In the following rock fragment fields put in the percent and size (SZ) of the various size classes of rock fragments, starting with the largest size found in the soil horizon (see Appendix A.3 for proper codes).

f. Save the new horizon data by selecting "Quit" from the "Modify" screen menu. At the prompt "Save these changes?" select "Yes."

3. Editing existing horizon data

a. Use the "Goto" option on the top menu screen to select the site/pedon to be edited (see section A.2 - Selecting Pedons). The data on file will be shown on the screen.

b. To insert a new horizon between two existing horizons select "Modify" from the top screen menu. When the new screen top menu appears, select "Insert." An indicator arrow will appear on the left side of the screen. Use the up and down cursor arrows to position the indicator where the new horizon is to be inserted and press <enter>. At the prompt "Do you really want to insert a horizon at the arrow?" select "Yes."

c. To edit existing horizon data, follow the same steps described in section C.2 for entering new horizon data. Type the new data over the existing data.

4. Deleting horizon records

a. Use the "Goto" option on the top menu screen to select the site/pedon to be edited (see section A.2 - Selecting Pedons). The data on file will be shown on the screen.

b. Select "Modify" from the screen top menu. When the new screen menu appears, select "Del" (Delete). A pair of asterisks (*) will appear along the left side of the screen. Use the up and down cursor arrows to position the asterisks on the horizon to be deleted and press <enter>. At the prompt "Do you really want to delete the highlighted horizon?", select "Yes."

c. When a marked horizon is deleted, all of the data associated with that particular horizon in the Horizon (Horidata), Lab (Labdata), and Inputlab (Labinput) files are deleted. This does not affect the Sitedata file.

D. Lab and Lab Input Data

The procedures and keys used to enter or edit laboratory data or raw laboratory data for calculations are the same as those used for horizon data (see sections C.2, C.3-a and C.3-c). Use the Lab data entry screen to enter laboratory data that have already been calculated and are in final form. Use the Lab Input data entry screen to enter raw laboratory data that needs to be calculated. The calculated data will automatically be entered into the Labdata file and will appear on the Lab data entry screen. A description of the Lab and Lab Input variables can be found in the S & D (Structure and Description) files for Labdata (Appendix B.3-a) and Labinput (Appendix B.3-b). Hard copies of the input forms to record raw laboratory data are provided in Appendix C.

DATA OUTPUT

The data can be output in a hard copy, narrative report form (see Appendix D for an example) for individual sites, groups of sites, or for an entire county. Selected data can also be output to disk for use in an outside statistics and/or graphics program.

A. Data Tables (Narrative Reports)

The "Narrative Reports" selection can be made from the data entry and report submenu (Figure 5) or from any of the data entry screen top menus (Figure 6). The narrative report for a particular pedon consists of three parts: (1) site description; (2) horizon profile description; and (3) laboratory data tables. The three parts of the narrative report can be printed separately or in combination. Reports can be produced for an individual pedon, all of the pedons for a particular soil series, or all of the characterized pedons in a county. The narrative reports are normally directed to a printer. The reports can be directed to an ASCII file by changing the system printer setup (see the following section "System Setup"). An example narrative report can be found in Appendix D.

The laboratory table program has a feature that vertically squeezes the data printed for pedons with more than 14 horizons so that all of the data fits on two pages - one page for physical and one for chemical and mineralogical data (the system also allows you to override this feature if the number of horizons is such that the lines may overlap).

1. Narrative reports for individual pedons

a. Choose the "Narrative Reports" option from the data entry and narrative report submenu (Figure 5). When the Selected Sites & Soils/ Selected Counties submenu appears on the screen, move the selection bar to "Selected Sites & Soils" (Figure 8) and press <enter>.

b. A listing of individual pedons, sorted by pedon number (state-county-unit) will appear on the screen (Figure 9). Move the highlight bar to the desired pedon.

c. Site, horizon and laboratory reports can be printed individually or in any combination by selecting the appropriate letter (letter options are displayed beside the pedon listing, as illustrated in Figure 9). Select any combination of reports for as many pedons as you desire and then press <enter> to send the reports to the printer.

2. Narrative reports by soil series

a. Follow step 1-a above to bring up the pedon listing. Press <Alt> plus O to sort the listing alphabetically by soil series name. Move the highlight bar to the desired soil series. Select the reports for all of the pedon listings for that particular series and press <enter> to send the reports to the printer.

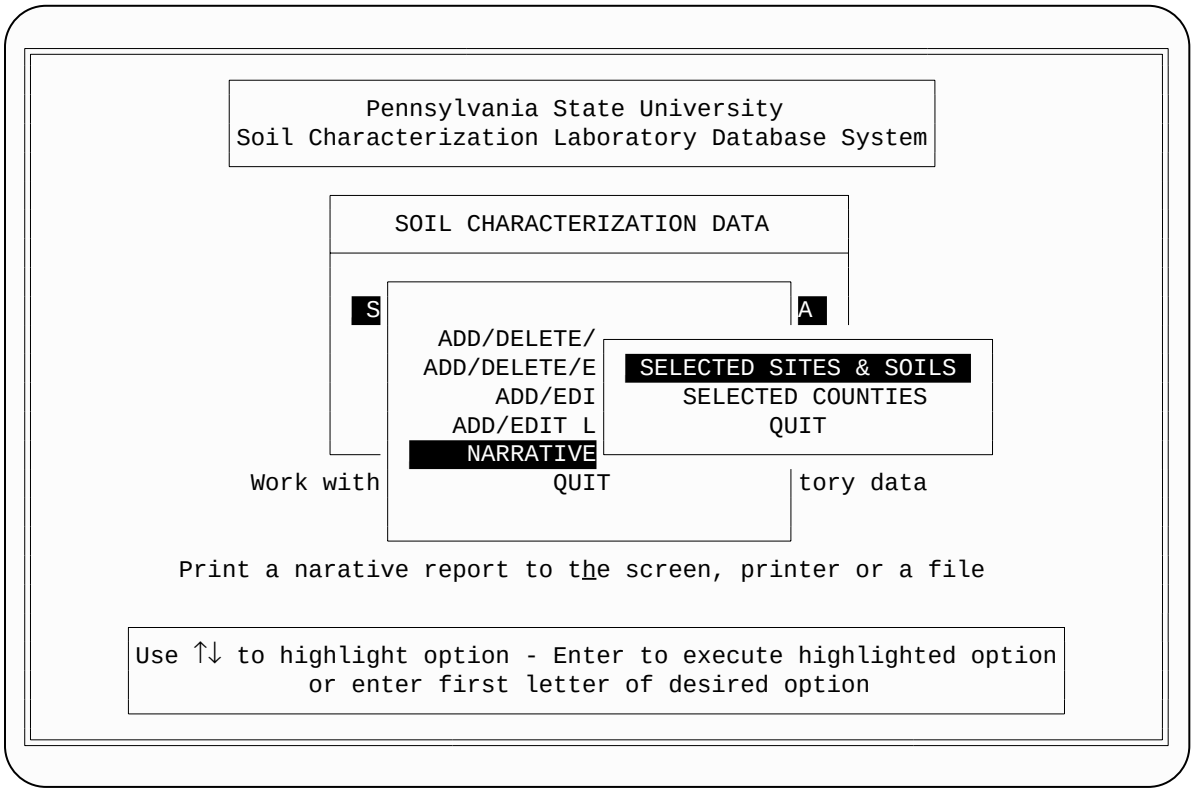

Figure 8. Selected Sites & Soils / Selected Counties narrative report menu.

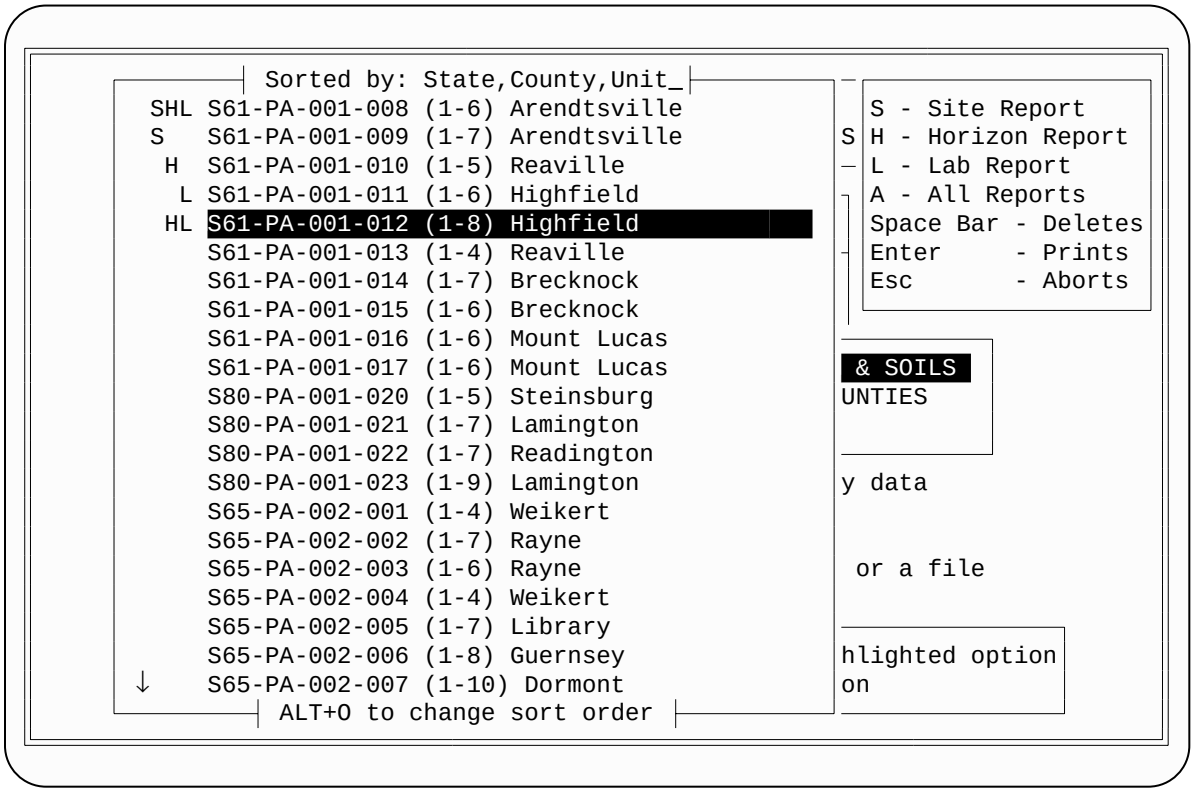

Figure 9. Screen showing part of the selected sites and soils list for narrative reports.

3. Narrative reports by county

a. Choose the "Narrative Reports" option from the data entry and narrative report submenu (Figure 5). When the Selected Sites & Soils/ Selected Counties submenu appears on the screen (Figure 8), move the selection bar to "Selected Counties" and press <enter>.

b. A listing of counties, sorted by alphabetical order will appear on the screen (Figure 10). Move the highlight bar to the desired county.

c. Site, horizon, and laboratory reports can be printed individually or in any combination for all of the characterized soils in a particular county by selecting the appropriate letter (letter options are displayed beside the pedon listing, as illustrated in Figure 10). Select any combination of reports for as many counties as you desire and then press <enter> to send the reports to the printer.

4. Narrative reports from data entry screen top menus

Narrative reports can be generated from any of the data entry screen top menus (Figures 6). The Rept (Report) selection allows you to produce any combination of Site, Horizon, and Lab reports for the pedon on the screen. A report will only be produced for the pedon displayed on the entry screen. This option does allow for direct movement between all data input screens to view the data before it is printed. Follow the directions for entering the data entry screen (see Data Entry) and for selecting pedons (section A.2 under Data Entry). Select Rept from the screen top menu, choose the desired reports to be printed, and press <enter>.

B. Data Output to Disk

Selected data can also be output to disk for use in various statistics and graphics programs. Data format options include dBase, Lotus 1-2-3, Minitab, and ASCII.

1. Move the selection bar to "Export Data" on the soil characterization data menu (Figure 4) and press <enter>.

   A listing of the various field code names in the Sitedata, Horidata, and Labdata files (see Appendix B for a description of the field names) will appear on the screen (Figure 11). A "Help" box on the right side of the screen provides a list of cursor movement and data selection commands.

2. Select the data fields first. Move the cursor bar to each desired field and press <enter>. A listing of the selected fields will be displayed on the bottom half of the screen (Figure 12). When all of the fields have been selected, press <Ctrl> plus <End> to complete the field selection step.

3. Once you select the data fields, you will be asked "Do you wish to specify selection criteria?" This step allows you to set parameters for the selected data fields. For instance, you can specify data for certain soil series or for certain ranges of data, such as percent clay between 18 and 35 percent. For numeric fields be sure to select a range of values > 0, since missing data are assigned a 0 value and would not actually be a true 0 value. Move the cursor bar to the desired field and press <enter>. For the SERIESNAME field, a listing of soil series names will appear. For the other fields, a list of options allow you to specify a value or range of values (Figure 13).

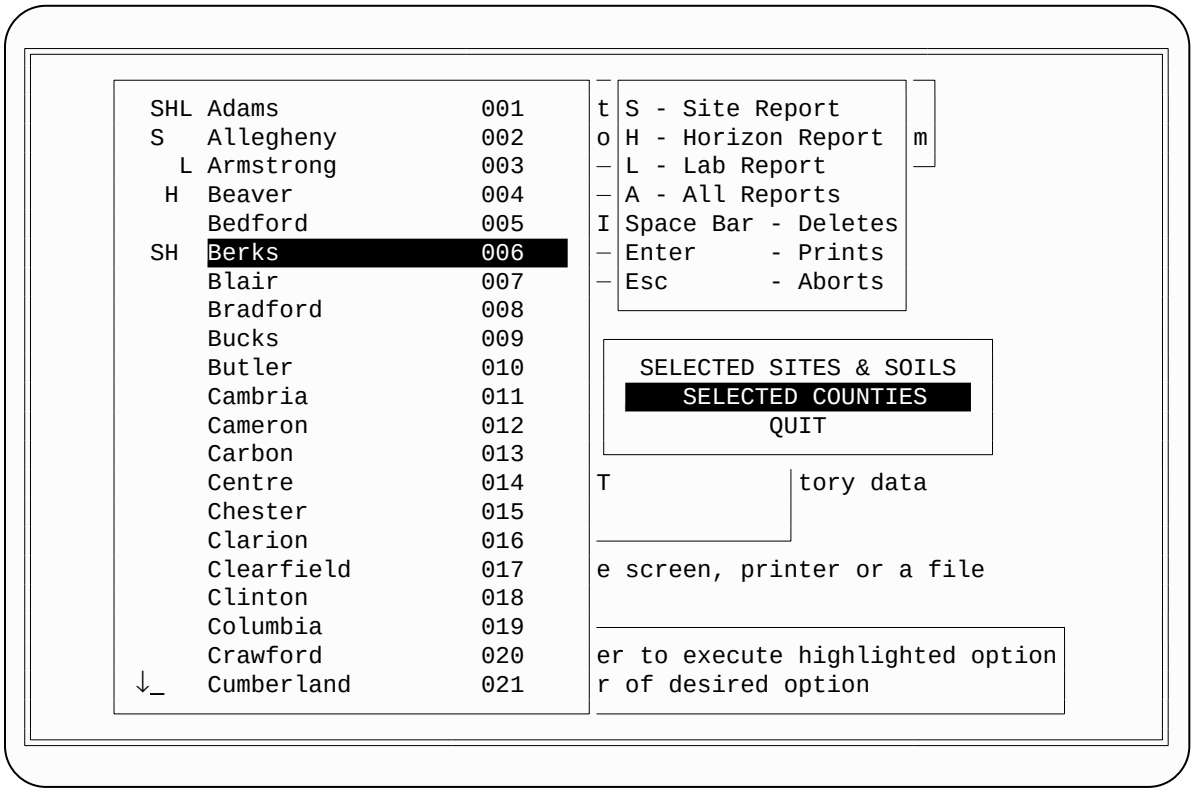

Figure 10. Screen showing part of the selected counties list for narrative reports.

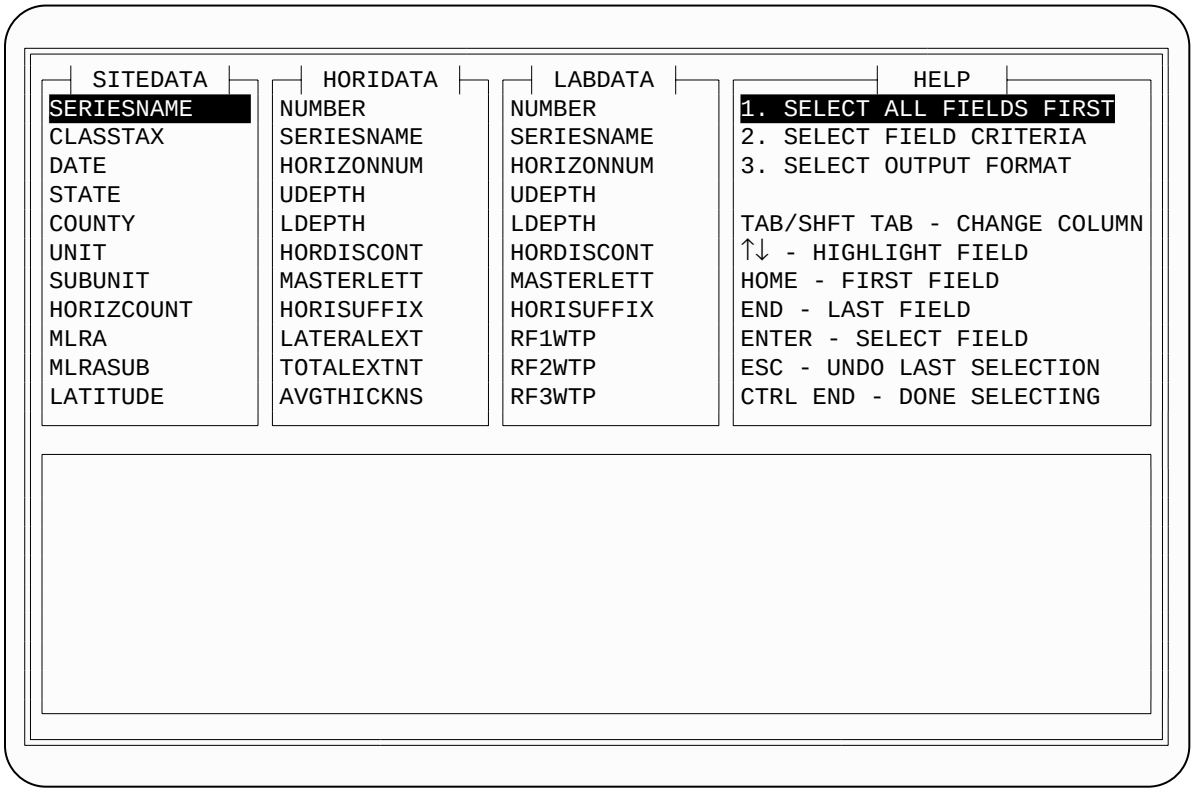

Figure 11. Field selection screen for data export.

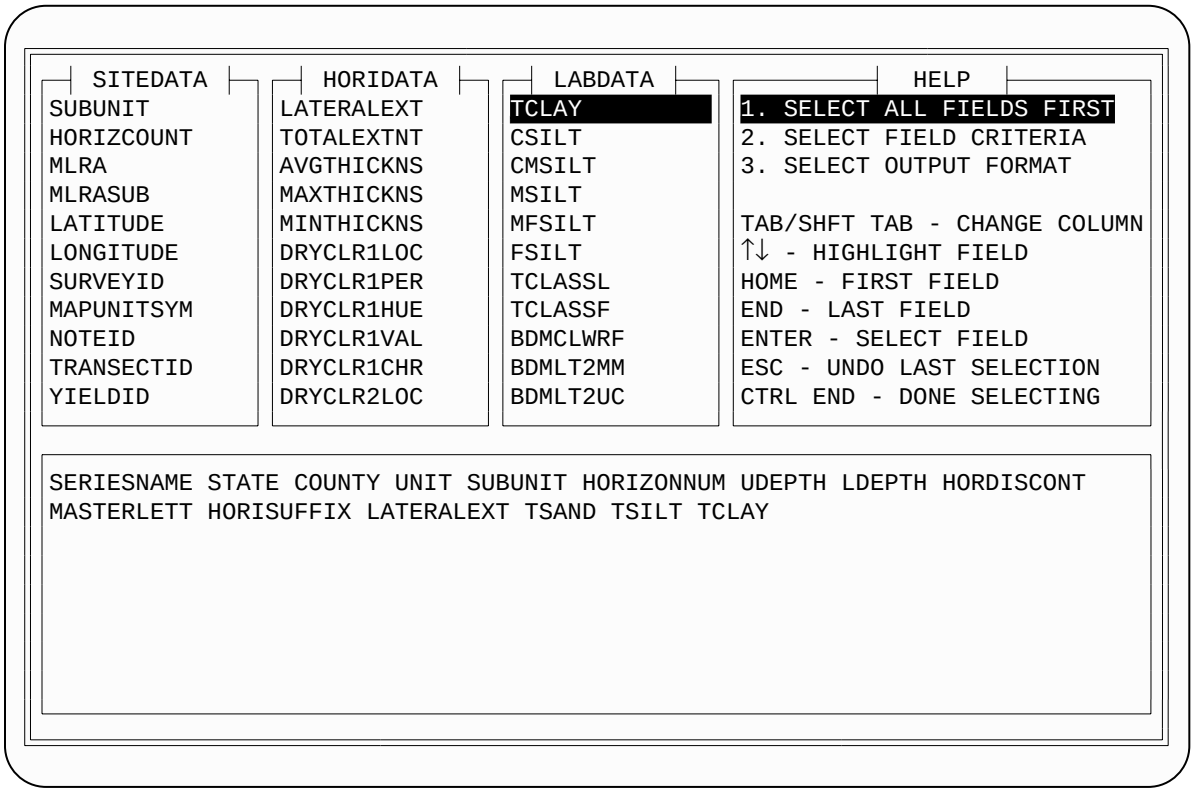

Figure 12. Field selection screen for data export, displaying the list of selected fields.

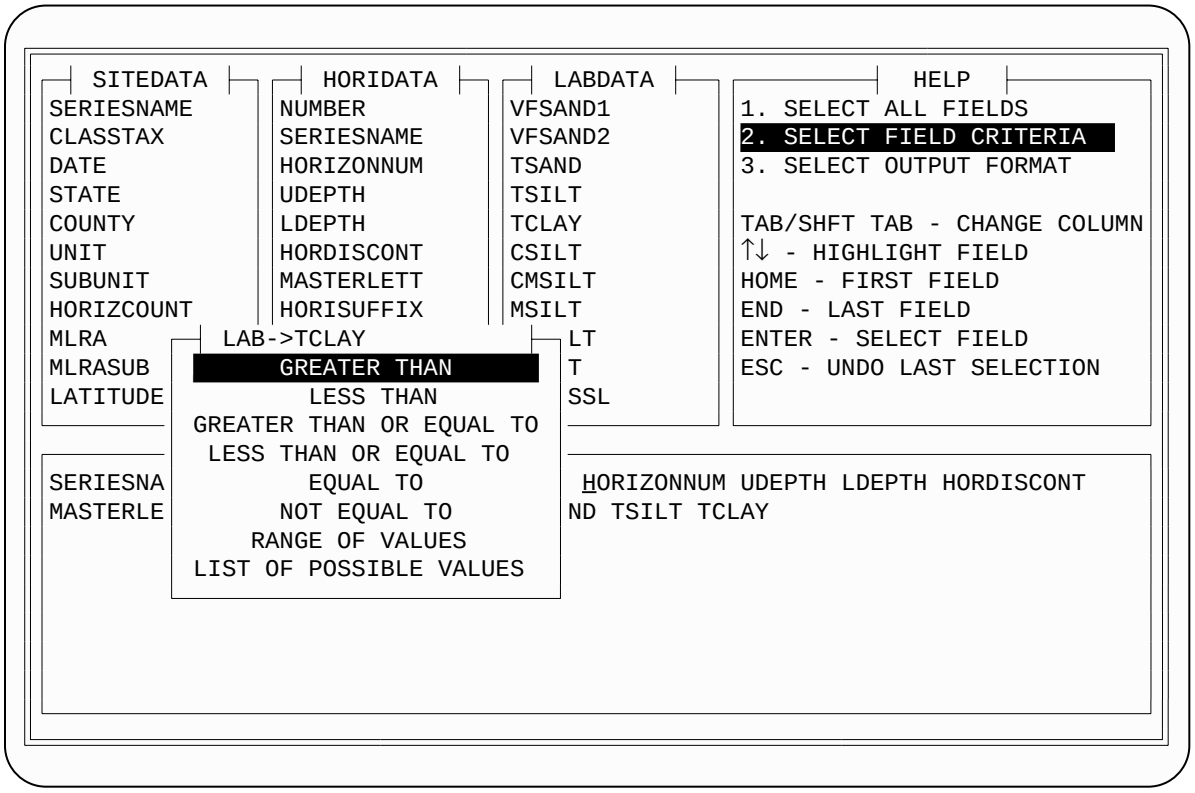

Figure 13. Screen showing option list for specifying data field criteria for data export.

The selection criteria will be displayed on the bottom half of the screen and you will be asked whether you desire to specify additional criteria (Figure 14).

4. Once the field criteria are selected, the system will display a list of available output formats (Figure 15). Select the desired format and specify the file name (include drive, directory, and file name). The data will be copied to that file, along with a second file which provides the field code name, the structure of the field, and a brief description of the field.

SYSTEM SETUP

The "System Setup" option on the main system menu (Figure 3) allows you to select different printer outputs and printer ports (Figure 16). Narrative reports can be directed to any listed printer available to the computer or to an ASCII disk file (Figure 17). The ASCII output file includes all of the printed features of the narrative reports -- site and horizon descriptions and laboratory data with headings in table format. Make the printer or ASCII output selection (be sure to specify the appropriate printer port) before generating the narrative report. To cancel or change the selection at any time during the system operation, you must return to the report or ASCII output selection screen (Figure 17).

CODE FILES

The "Code Files" option from the main menu (Figure 3) allows you to edit or add to the code files for selected fields (Figure 18). Select the desired field from the Code File List menu (Figure 18). The Edit menu (Figure 19) allows you to add to, delete from, or edit the existing list of coded variables for soil series names, classification, vegetation codes, site description codes, Munsell color codes, or horizon description codes. Adding or deleting a soil name only affects the pick list that is available when a new site is added to the Site File.

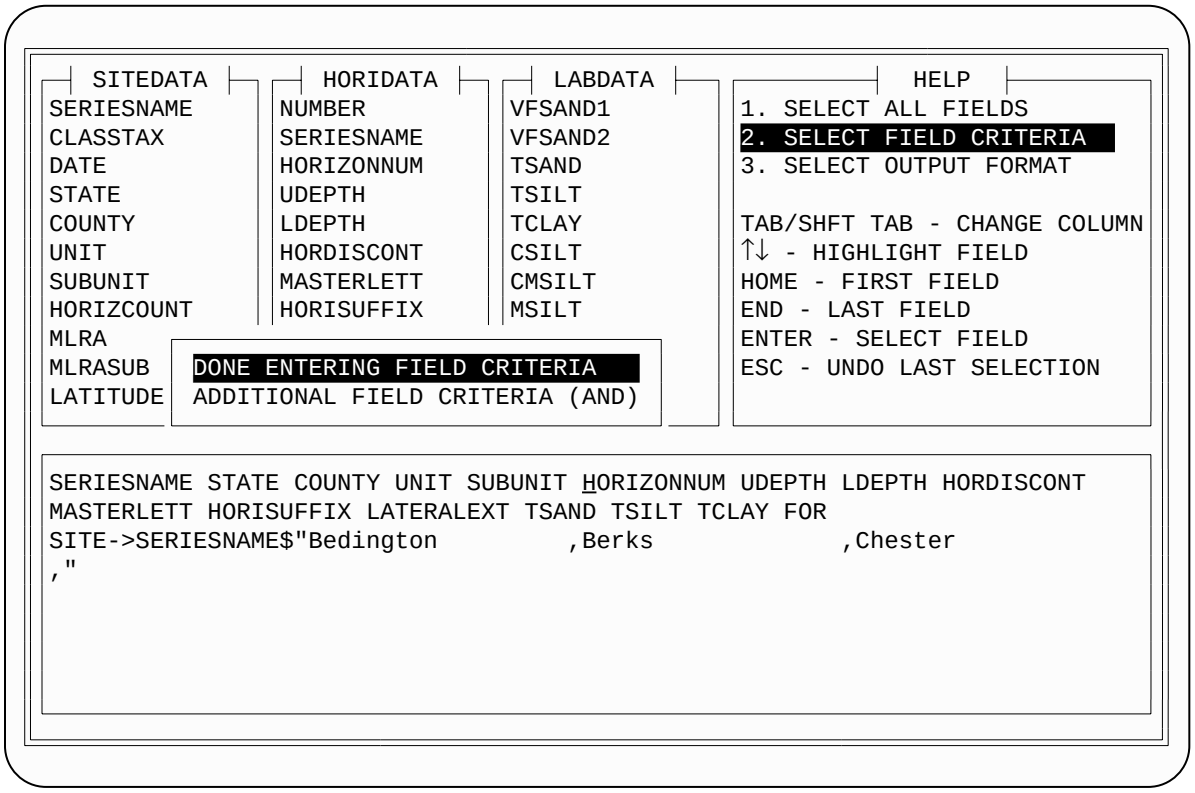

Figure 14. Field criteria selection screen for data export.

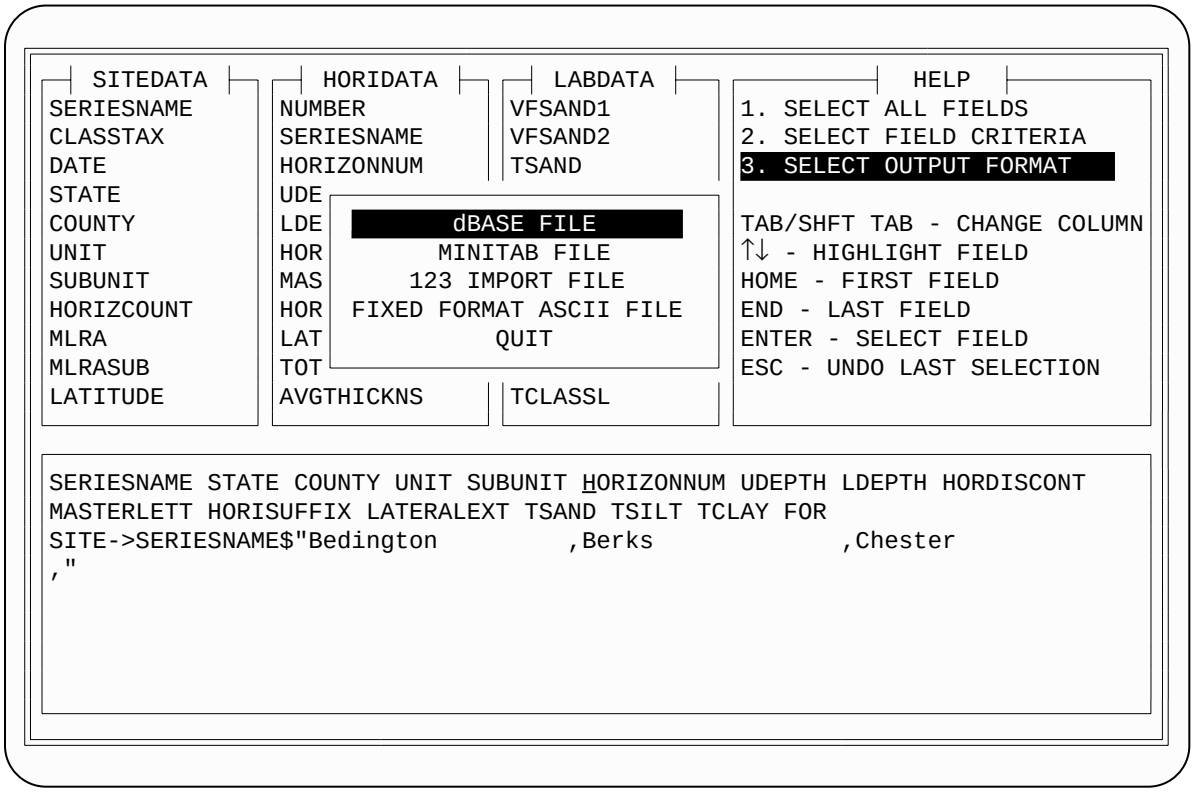

Figure 15. Data format options menu for data export.

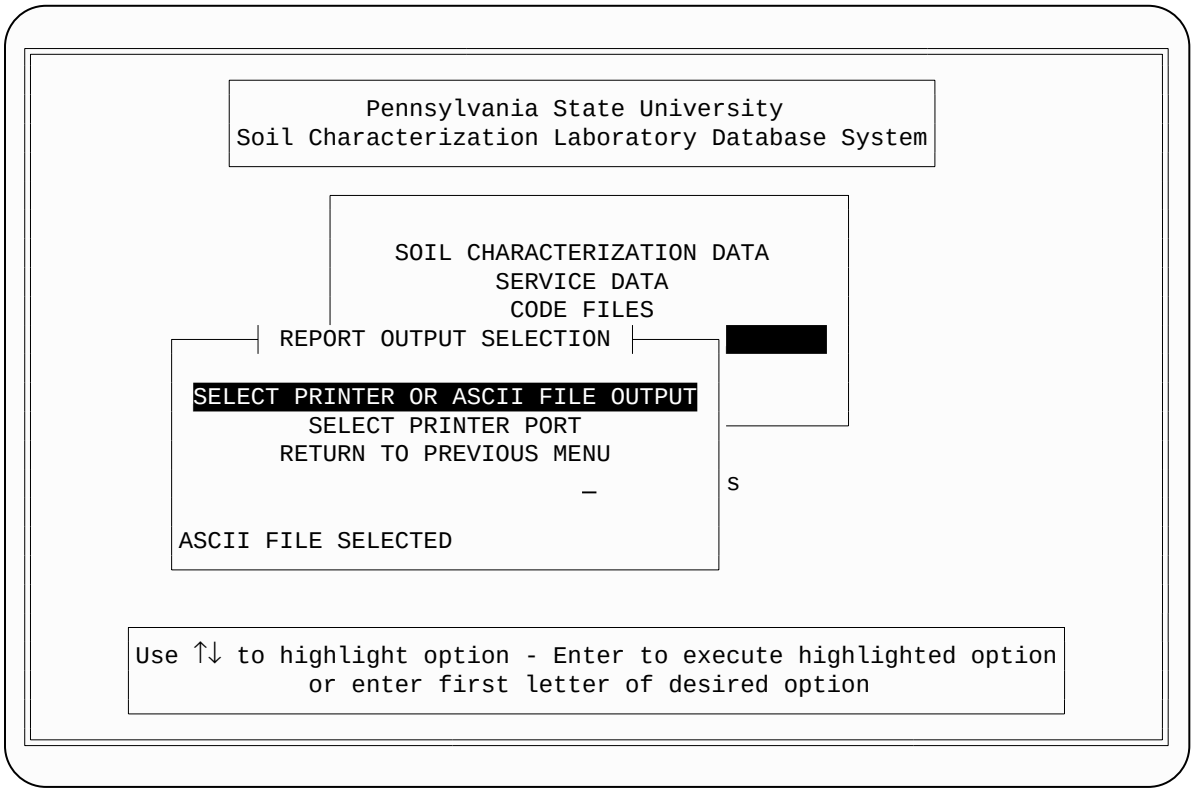

Figure 16. Printer or file report output and port selection menu for system setup.

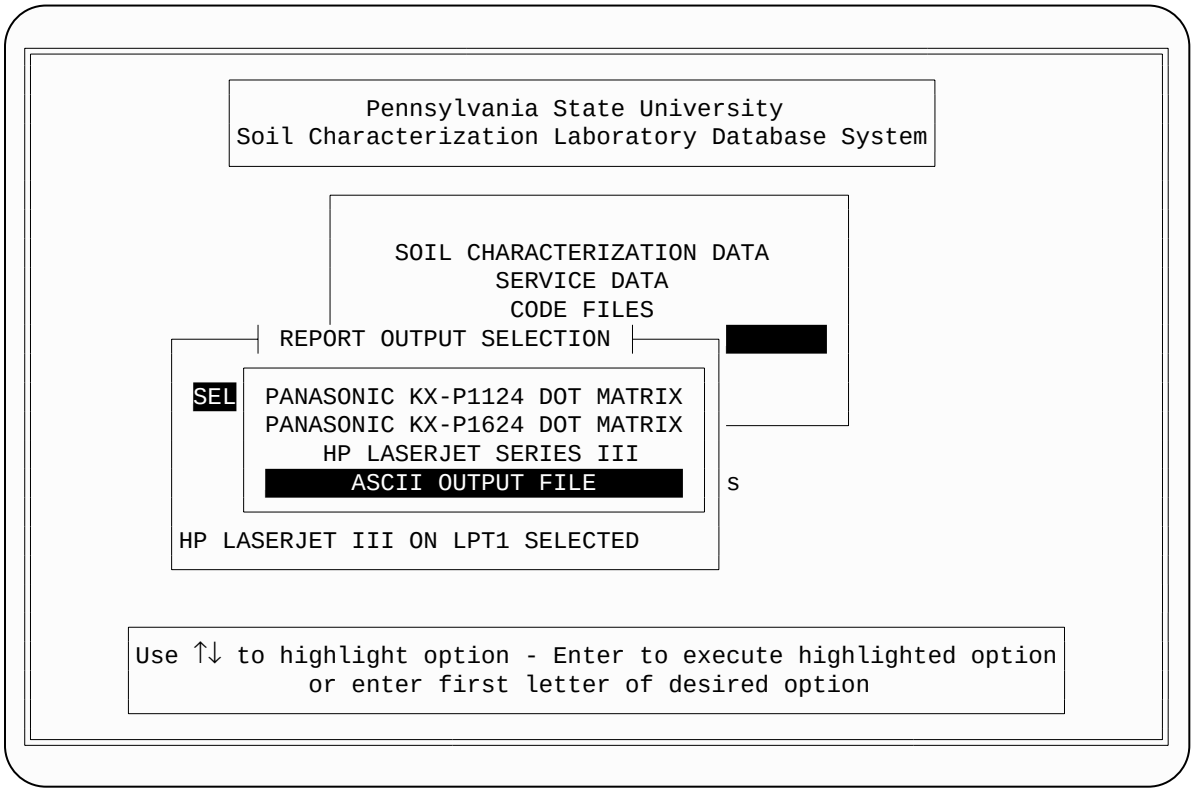

Figure 17. Printer type or ASCII report output selection list for system setup.

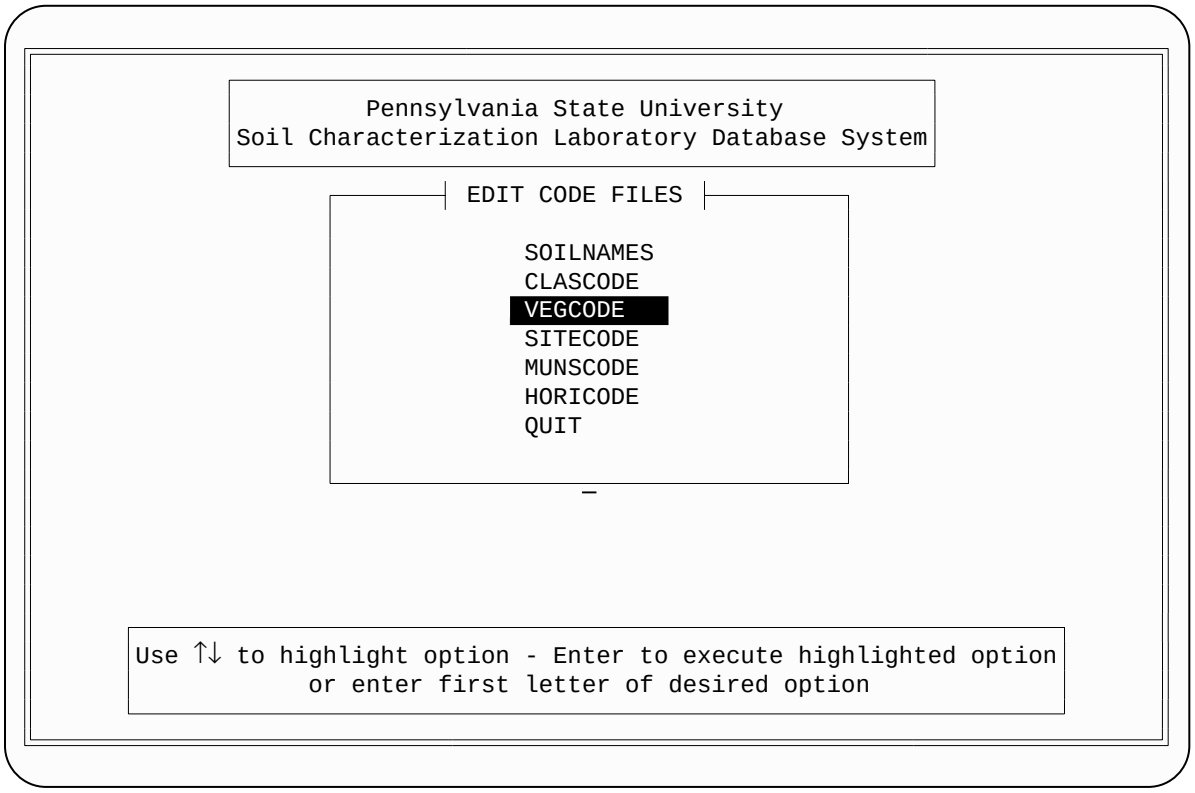

Figure 18. Code file listing menu for code file editing.

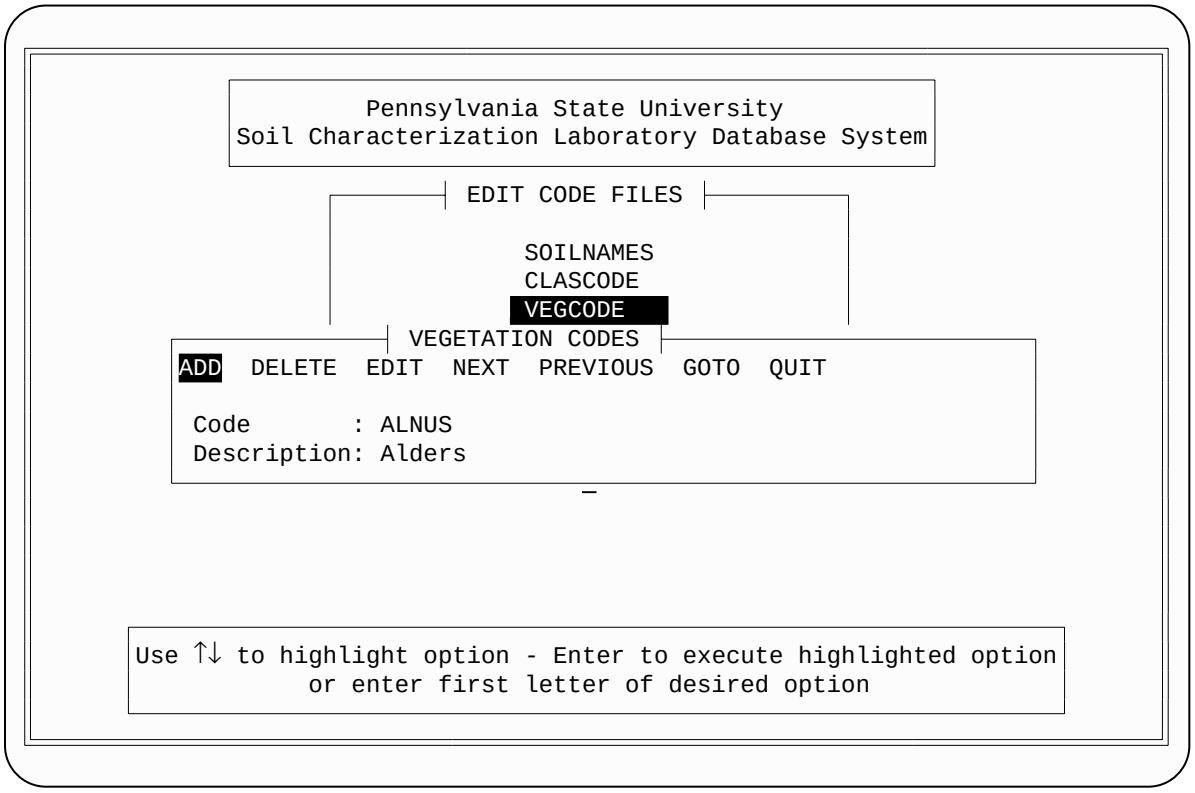

Figure 19. Code file edit menu screen.

APPENDIX A. Site and Horizon Codes and Forms

1. Site codes

PENNSYLVANIA STATE UNIVERSITY SOIL CHARACTERIZATION LABORATORY
LISTING OF SITE CODES
APRIL 17, 1991

SITE ID
ST STATE

PA	Pennsylvania
NY	New York

SITE ID
CNT COUNTY

001	Adams
002	Allegheny
003	Armstrong
004	Beaver
005	Bedford
006	Berks
007	Blair
008	Bradford
009	Bucks
010	Butler
011	Cambria
012	Cameron
013	Carbon
014	Centre
015	Chester
016	Clarion
017	Clearfield
018	Clinton
019	Columbia
020	Crawford
021	Cumberland
022	Dauphin
023	Delaware
024	Elk
025	Erie
026	Fayette
027	Forest
028	Franklin
029	Fulton
030	Greene
031	Huntingdon
032	Indiana
033	Jefferson
034	Juniata
035	Lackawanna
036	Lancaster
037	Lawrence
038	Lebanon
039	Lehigh
040	Luzerne
041	Lycoming
042	Mckean
043	Mercer
044	Mifflin
045	Monroe
046	Montgomery
047	Montour
048	Northampton
049	Northumberland
050	Perry
051	Philadelphia
052	Pike
053	Potter
054	Schuylkill
055	Snyder
056	Somerset
057	Sullivan
058	Susquehanna
059	Tioga
060	Union
061	Venango
062	Warren
063	Washington
064	Wayne
065	Westmoreland
066	Wyoming
067	York

MLRA MAJOR LAND RESOURCE AREA

100	Erie Lake Plain
124	Western Allegheny Plateau
126	Central Allegheny Plateau and Mountains
127	Eastern Allegheny Plateau and Mountains
130	Blue Ridge
139	Eastern Ohio Till Plain
140	Glaciated Allegheny Plateau
147	Northern Appalachian Ridges and Valleys
148	Northern Piedmont
149	Northern Coastal Plain

ID SOIL SURVEY AREA ID NUMBER

SYMB MAP UNIT SYMBOL

NOTE ID ID NUMBER FOR NOTES

TRAN ID TRANSECT ID NUMBER

YLD ID YIELD ID NUMBER

PHOTO # AIRPHOTO NUMBER

DT	DESCRIPTION TYPE
CY	Crop yield data site
FN	Field notes
FS	Forestry data site
PC	Full pedon desc for lab characterization
PD	Full pedon description
RP	Descrip. for research study
RS	Range data site

PT	PEDON TYPE
MI	Map unit inclusion
MO	Modal pedon for series
MR	Within range of map unit
MU	Modal pedon for map unit
OS	Outside range of series
SR	Within range of series
TP	Typical pedon for series

SLP SLOPE PERCENT INCLINATION
Percent

SHP SLOPE SHAPE
U A UP AND DOWN - U : ACROSS - A

1	Convex
2	Plane
3	Concave

GM	GEOMORPHIC AREA
1	Interfluve
2	Head slope
3	Side slope
4	Nose slope

HS	HILL SLOPE AREA
1	Summit
2	Shoulder
3	Back slope
4	Foot slope
5	Toe slope

MICRO K MICROTOPOGRAPHY KIND

B	Micro depression
C	Tree throw feature
F	Frost polygon
G	Gilgai
L	Land leveled or smooth
M	Mound
T	Terracettes
Z	Other (specified in notes)

MICRO A MICROTOPOGRAPHY AMOUNT

0	Minimal variation
1	<20 cm variation
2	20-50 cm variation
4	50-100 cm variation

MICRO P MICROTOPOGRAPHY PATTERN

0	No pattern
1	Linear
2	Closed depression
3	Reticulate

SLP POS POSITION ON SLOPE

2	On a slope
3	On upper third
4	On middle third
5	On lower third
7	On a slope and in a depression
8	In a depression
9	In a drainageway

APPENDIX A-1 (Continued)

PHYS PRI	PHYSIOGRAPHY PRIMARY
BA	Badlands
BI	Barrier island
BO	Bolson
CA	Canyon
CF	Coalescent fan piedmont
CP	Coastal plain
DF	Drumlin field
DP	Dissected plateau
FH	Foothills
GF	Glaciofluvial landform
GP	Glaciated plateau
GU	Glaciated uplands
HH	High hill
HI	Hills
KP	Karst plain
LP	Lake plain
LU	Level or undulating upland
LV	Lava plain
MO	Mountains
MV	Mountain valley
PI	Piedmont
PL	Plains
PT	Plateau
RI	Ridge and valley
RV	River valley
SB	Semibolson
SH	Sandhills
TA	Tableland
TL	Triassic lowlands
VM	Volcanic mountains

PHYS SEC	PHYSIOGRAPHY SECONDARY
AF	Alluvial fan
AP	Alluvial flat (plain)
BE	Beach
BF	Barrier flat
BO	Bog
BS	Backswamp
BT	Beach terrace
BU	Butte
CB	Carolina bay
CO	Cove
CR	Crater
CU	Cuesta
DE	Delta
DO	Dome
DR	Drumlin
DU	Dune
EK	Esker
EM	End moraine
ES	Escarpment
FE	Felsenmeer
FJ	Fjord
FP	Flood plain
FT	Fluvial terrace
GM	Ground Moraine
HO	Hogback
HS	Hillside
KA	Kame
KE	Kettle
LO	Lowlands
LP	Lake plain
LS	Low sand ridge
LT	Lake terrace
MA	Marsh
ME	Mesa
MO	Mountainside
MT	Marine terrace
OP	Outwash plain
OT	Outwash terrace
OX	Oxbow
PE	Pediment
PL	Playa
RI	Ridge
RP	Primary ridge top
RS	Secondary ridge top
RU	Primary ridge sideslope
RV	Secondary ridge sideslope
SB	Structural bench
SI	Sink
SL	Slough
SM	Salt marsh
SW	Swamp
UL	Level to undulating upland
UP	Upland
VC	Volcanic cone
VF	Valley floor
VS	Valley side

PEDON CLASSIFICATION

See page 6

WATERTABLE

KD	KIND
2	Perched
3	Apparent
4	Ground

LU	LAND USE
A	Abandoned cropland
C	Cropland
E	Forest land grazed
F	Forest land not grazed
G	Pasture land and native pasture
H	Horticultural land
I	Cropland irrigated
J	Hayland
L	Waste disposal land
M	Coal mined land
N	Barren land
O	Orchards and vineyards
P	Rangeland grazed
Q	Wetlands drained
R	Wetlands
S	Rangeland not grazed
T	Tundra
U	Urban and built up land

ST	STONINESS
A	Class 0 (or percent cover)
B	Class 1 (or percent cover)
C	Class 2 (or percent cover)
D	Class 3 (or percent cover)
E	Class 4 (or percent cover)
F	Class 5 (or percent cover)

HC	HYDRAULIC CONDUCTIVITY
1	Very low
2	Low
3	Moderately low
4	Moderately high
5	High
6	Very high

DR	DRAINAGE CLASS
1	Very poorly drained
2	Poorly drained
3	Somewhat poorly drained
4	Moderately well drained
5	Well drained
6	Somewhat excessively drained
7	Excessively drained

ELEV	ELEVATION
Meters	

PARENT MATERIAL

W	DEGREE OF WEATHERING
0	Unweathered
1	Slight
2	Moderate
3	Strong

PARENT MATERIAL

M	MODE OF DEPOSITION
A	Alluvium
B	Old alluvium
C	Colluvium
D	Glacial drift
E	Eolian
F	Mine spoil
G	Glacial outwash
H	Volcanic ash
I	Lacustrine sands
J	Lacustrine silts
K	Lacustrine clays
L	Lacustrine
M	Marine
N	Marine sands
O	Organic
P	Marine silts
Q	Marine clays
R	Rock
S	Eolian sand
T	Glacial till
U	Unconsolidated sediments
V	Local colluvium
W	Loess
X	Residuum
Y	Solifluctate
Z	Esturarine

APPENDIX A-1 (Continued)

PARENT MATERIAL

OR	ORIGIN
A0	Sandstone
A1	Noncalcareous sandstone
A2	Arkosic sandstone
A4	Calcareous sandstone
A5	Red acid sandstone
A6	Gray & brown acid sandstone
B0	Interbedded sedimentary
B1	Limestone-sandstone-shale
B2	Limestone-sandstone
B3	Limestone-shale
B4	Limestone-siltstone
B5	Sandstone-shale
B6	Sandstone-siltstone
B7	Shale-siltstone
B8	Shale & sandstone
C0	Conglomerate
C1	Noncalcar. conglomerate
C2	Calcareous conglomerate
E0	Ejecta ash
E1	Acidic ash
E2	Basic ash
E3	Basaltic ash
E4	Andesitic ash
E5	Cinders
E6	Pumice
E7	Scoria
E8	Volcanic bombs
H0	Shale
H1	Noncalcareous shale
H2	Calcareous shale
H3	Clay shale
H4	Red acid shale
H5	Gray & brown acid shale
H6	Red calcareous shale
I0	Igneous
I1	Coarse igneous
I2	Basic igneous
I3	Intermediate igneous
I4	Granite
I5	Fine igneous
I6	Diabase or basalt
I7	Andesite
I8	Acid igneous rock
I9	Ultrabasic igneous
K0	Organic
K1	Mossy material
K2	Herbaceous material
K3	Woody material
K4	Wood fragments
K5	Logs and stumps
K6	Charcoal
K7	Coal
L0	Limestone
L1	Chalk
L2	Marble
L3	Dolomite
L4	Phosphatic limestone
L5	Very sandy limestone
L6	Argillaceous limestone
L7	Cherty limestone
L8	Very cherty limestone
L9	Chert
M0	Metamorphic
M1	Gneiss
M2	Acidic gneiss
M3	Basic gneiss
M4	Serpentine
M5	Phyllite
M6	Acid schist
M7	Basic schist
M8	Slate
M9	Quartzite
O0	Metarhyolite
O1	Quartz
O2	Graphitic schist
O3	Mica schist
O4	Gray hornfelts
P0	Pyroclastic
P1	Tuff
P2	Acidic tuff
P3	Basic tuff
P4	Volcanic breccia
P5	Acidic breccia
P6	Basic breccia
P7	Tuff breccia
P8	AA
P9	Pahoehoe
S0	Sedimentary
S1	Marl
S2	Glauconite
T0	Siltstone
T1	Noncalcareous siltstone
T2	Calcareous siltstone
T3	Red acid siltstone
T4	Gray & brown acid siltstone
Y0	Mixed
Y1	Noncalcareous mixed
Y2	Calacareous mixed
Y4	Mixed igneous-metamorphic-sedimentary
Y5	Mixed igneous-metamorphic
Y6	Mixed igneous-sedimentary
Y7	Mixed metamorphic-sedimentary

BEDROCK

BRD	BEDROCK DIP
Degrees	

BEDROCK

BRS	BEDROCK STRIKE
Degrees	

BEDROCK

BRF	BEDROCK FRACTURE
1	< 10 cm betw. fractures
2	10-45 cm betw. fractures
3	45 cm - 1 m betw. fractures
4	1.0-2.0 m betw. fractures
5	> 2.0 m betw. fractures

MOS

REG	MOSITURE REGIME
AQ	Aquic
AR	Aridic
PA	Peraquic
PU	Perudic
TO	Torric
UD	Udic
US	Ustic
XE	Xeric

ER

WA	WATER EROSION CLASS
0	None
1	Slight
2	Moderate
3	Severe

RN

OF	RUNOFF CLASS
1	None
2	Ponded
3	Very slow
4	Slow
5	Moderate
6	Rapid
7	Very rapid

DIAGNOSTIC FEATURES

KND	KIND
1	Kandic
A	Anthropic
B	Cambic
C	Calcic
D	Durinodes
E	Petrocalcic
F	Fragipan
G	Gypsic
H	Histic
I	Sombric
J	Petrogypsic
K	Placic
L	Lithic contact
M	Mollic
N	Natric
O	Ochric
P	Plaggen
Q	Albic
R	Argic
S	Spodic
T	Argillic
U	Umbric
V	Sulfuric
W	Paralithic contact
X	Oxic
Y	Salic
Z	Duripan

APPENDIX A-1 (Continued)

FLOODING

FRQ	FREQUENCY CLASS
CO	Common (every 1 - 20 yr)
FR	Frequent (every 1 - 2 yr)
NO	None
OC	Occasional (every 2 - 20 yr)
RA	Rare (> every 20 years)

PONDING

FRQ	FREQUENCY CLASS
CO	Common
FR	Frequent
NO	None
OC	Occasional
RA	Rare

PERM	PERMEABILITY CLASS
1	Very slow
2	Slow
3	Moderately slow
4	Moderate
5	Moderately rapid
6	Rapid
7	Very rapid

PA PARAMAT PENNSYLVANIA PARENT MATERIAL

01	Aeolian
011	Loess
012	Aeolian sands
02	Coastal plain sediments
03	Colluvium
031	Sandstone colluvium
0311	Grayish brown sandstone colluvium
0312	Red sandstone colluvium
032	Shale colluvium
0321	Grayish brown shale colluvium
0322	Red shale colluvium
033	Cherty limestone colluvium
034	Limestone colluvium
04	Fluvial
041	Fluvial terrace
0411	Fine/medium,fluvial terrace
04111	Grayish brown find/medium fluvial terrace
04112	Red fine/medium fluvial terrace
0412	Coarse,fluvial terrace
04121	Grayish brown coarse fluvial terrace
04122	Red coarse fluvial terrace
042	Floodplain
0421	Fine and medium textured floodplain
04211	Grayish brown fine and medium textured floodplain
04212	Red fine and medium textured floodplain
0422	Coarse textured floodplain
04221	Grayish brown coarse textured floodplain
04222	Red coarse textured floodplain
05	Igneous rock
051	Granite
052	Diabase
06	Lacustrine silts and clays
07	Limestone
071	Cherty limestone
072	Shaley limestone
073	Very cherty limestone
074	Schisty limestone
075	Very sandy limestone
08	Metamorphic rock
081	Schist
0811	Graphitic schist
082	Gneiss
083	Slate
084	Marble
085	Quartzite
086	Fanglomerate
087	Gray hornfelts
088	Serpentinite
089	Metarhyolite
09	Sandstone
091	Grayish brown sandstone
092	Red sandstone
10	Shale
105	Acid shale
1051	Grayish brown acid shale
1052	Red acid shale
106	Calcareous shale
1061	Grayish brown calcareous shale
1062	Red calcareous shale
11	Glacial till
117	Acid glacial till
1173	Wisconsinan, acid, glacial till
11731	Grayish brown acid med/coa Wisc. glacial till
11732	Red acid med/coarse Wisconsinan glacial till
11733	Fine, Wisconsinan, acid, glacial till
11734	Med/coarse,Wisconsinan,acid,glacial till
1174	Pre-Wisconsinan,acid,glacial till
11741	Fine, pre-Wisconsinan, acid glacial till
11742	Med/coa, pre-Wisc., acid, glacial till
11743	Grayish brown acid pre-Wisc. glacial till
118	Non-acid to calcareous glacial till
1183	Wisc., non-acid to calcareous glacial till
11831	Fine, Wisc., non-acid to calcareous glacial till
11832	Med/coa, Wisc., non-acid to calcareous glacial
1184	Pre-Wisc., non-acid to calcareous glacial till
11841	Fine, pre-Wisc., non-acid to calcar. glacial till
11842	Med/coa, pre-Wisc., non-acid to calcar. glacial till
12	Siltstone
121	Calcareous siltstone
122	Acid siltstone
13	Chert
14	Glacial outwash
141	Grayish brown glacial outwash
142	Red glacial outwash
11744	Red acid pre-Wisc. glacial till

VEGETATION SPECIES

Alders	ALNUS	Black Locust	ROPS		SH
Alfalfa	MESA	Black Oak	QUVE	Buckhorn Plantain	PLLA
American Beech	FAGR	Black Spruce	PIMA	Buttercup	RANUN
American Elm	ULAM	Black Willow	SANI	Butternut	JUCI
Amer. Hornbeam	CACA18	Blackberry	RUHA	Canada Bluegrass	POCO
Annual Forbs	FORBS	Blackgum	NYSY	Canada Thistle	CIAR4
Apple	MALUS	Blackhaw	VIPR	Cattail	TYPHA
Ash	FRAXI	Blueberry	VACCI	Cedar	CEDRU
Asters	ASTER	Bluegrass	POA	Cheatgrass	BRTE
Austrian Pine	PINI	Bluestem	ANDRO2	Cherry	PRUNU
Balsam Fir	ABBA	Boneset	BONE	Chestnut	CHNUT
Barley	HORDE	Bracken Fern	PTAQ	Chestnut Grass	CHGR
Basswood	TILIA				
Beech	FAGUS	Bromegrass	BROM		
Birch	BETUL				
Birdsfoot Trefoil	LOCO6				
Bitternut Hickory	CACO15	Broom Sedge	CAS		
Black Birch	BELE		C11		
Black Cherry	PRSE2	Brush	BRU		

APPENDIX A-1 (Continued)

Chestnut Oak	QUPR2	Oats	AVENA	Understory	UNDER		
Chickory	CICHO	Orchardgrass	DAGL	Viburnium	VIBUR		
Chickweed	CERAS	Paper Birch	BEPA	Violets	VIOLA		
Cinquefoil	POTEN	Partridgeberry	MIRE	Virginia Creeper	PAQU2		
Clovers	TRIFO	Peach	PEACH	Virginia Pine	PIVI2		
Clubmoss	LYCOP2	Pennycress	THLAS	Walnut	JUGLA		
Coltsfoot	COLTF	Pin Oak	QUPA2	Weeds	WEED		
Common Mullein	VETH	Pines	PINUS	Wheat	TRAE		
Conifers	CONI	Pitch Pine	PIRI	White Ash	FRAM2		
Corn	ZEMA	Plantains	PLANT	White Birch	BEPE2		
Cottongrass	COGR	Poison Ivy	RHRA	White Clover	TRRE3		
Crabapple	CRAB	Poke	POKE	White Oak	QUAL		
Cranberry	VAMA	Poplar	POPUL	Wild Carrot	DACA6		
Crownvetch	COVA2	Potato	SOTU	Wild Garlic	ALVI		
Cucumbertree	MAAC	Poverty Grass	POVG	Wild Grape	VITIS		
Curly Dock	RUCR	Princes Pine	CHUM	Wild Mustard	BRKAP		
Daisy	ERIGE2	Quackgrass	AGRE2	Wild Onion	ALLIU		
Dandelion	TARAX	Quaking Aspen	POTR5	Willow	SALIX		
Deertongue	DETO	Ragweed	AMPU4	Wintergreen	GAPR2		
Dogwood	CORNU	Raspberry	RUBUS	Witchazel	HAVI4		
Dropseed	SPORO	Red Birch	REBE	Yarrow	ACHIL		
Eastern Hemlock	TSCA	Red Clover	TRPR2	Yellow Birch	BEAL2		
Eastern Redcedar	JUVI	Red Fescue	FERU2				
East. White Pine	PIST	Red Maple	ACRU				
Elderberry	SAMBU	Red Oak	QURU				
Elm	ULMUS	Red Pine	PIRE				
False Spikenard	FASP	Redtop	AGAL3				
Ferns	POLYS	Reed Canarygrass	PHAR3				
Fire Cherry	FICH	Rhododendron	RHODO				
Foxtail	ALOPE	Rose	ROSA				
Golden Thread	GOTH	Rushes	JUNCU				
Goldenrod	SOLID	Ryegrass	LOLIU				
Grass	GRAS	Sassafras	SAAL5				
Gray Birch	BEPO	Scarlet Oak	QUCO2				
Greenbrier	SMILA2	Scotch Pine	PISY				
Hackberry	CELTI	Scrub Oak	SCROK				
Hardwoods	HARD	Sedges	CAREX				
Hawkweeds	HIERA	Serviceberry	AMELA				
Hawthorn	CRATA	Shadbush	AMAR3				
Hay	HAY	Shagbark Hickory	CAOV2				
Hazelnut	COCO6	Sheep Laurel	SHPLR				
Hickory	CARYA	Sheep Sorrel	RUAC3				
Honeysuckle	LONIC	Silky Cornel	SILCO				
Horsenettle	SOCA3	Silver Maple	ACSA2				
Huckleberry	GAYLU	Skunk Cabbage	VECA2				
Ironweed	VERNO	Smartweed	POLA4				
Ironwood	OLTE	Solomonseal	POPU4				
Jack Pine	PIBA2	Soybeans	SOY				
Japanese Flease Flower	JFFL	Spearmint	MESP3				
		Sphagnum Moss	SPHAG				
Japanese Larch	LAKA	Spireas	SPIRA				
Jewelweed	IMNO	Spruce	PICEA				
Juneberry	AMPA2	Stinging Nettle	URDI				
Ky. Bluegrass	POPR	Strawberry	FRAGA				
Lambkill	LAMKL	Striped Maple	ACPE				
Locusts	ROBIN	Sudangrass	SOSV				
Lovegrass	ERAGR	Sugar Maple	ACSA3				
Lycopodium	LYCOP2	Sumac	RHUS				
Maples	ACER	Sundew	DROSE				
May-apple	POPE	Swampgrass	HESC				
Milkweed	ASCLE	Sweet Vernal	ANOD				
Mockernut Hickory	CATO6	Sweet-fern	MYAS				
		Sweetgum	LIST2				
Moonshine Grass	DACOM	Tall Fescue	FEAR3				
Mosses	MOSS	Thornapple	THOAP				
Mountain Laurel	KALA	Timothy	PHLEU				
Muhly	MUHLE						
Northern Dewberry	RUFL	Trailing Arbutus	EPRE2				
Norway Spruce	PIAB	Trillium	TRILL				
Nutgrass	CYPER						
Oaks	QUERC	Tulip Poplar	LITU				

APPENDIX A-1 (Continued)

PEDON CLASSIFICATION

GG	GREATGROUP
AAQAL	Albaqualf
AAQDU	Duraqualf
AAQFR	Fragiaqualf
AAQGL	Glossaqualf
AAQKA	Kandiaqualf
AAQNA	Natraqualf
AAQOC	Ochraqualf
AAQPN	Plinthaqualf
AAQUM	Umbraqualf
ABOCR	Cryoboralf
ABOEU	Eutroboralf
ABOFR	Fragiboralf
ABOGL	Glossoboralf
ABONA	Natriboralf
ABOPA	Paleboralf
AUDAG	Agrudalf
AUDFE	Ferrudalf
AUDFR	Fragiudalf
AUDFS	Fraglossudalf
AUDGL	Glossudalf
AUDHA	Hapludalf
AUDKA	Kandiudalf
AUDKH	Kandhalpludalf
AUDNA	Natrudalf
AUDPA	Paleudalf
AUDRH	Rhodualf
AUSDU	Durustalf
AUSHA	Haplustalf
AUSKA	Kandiustalf
AUSKH	Kandhaplustalf
AUSNA	Natrustalf
AUSPA	Paleustalf
AUSPN	Plinthustalf
AUSRH	Rhodustalf
AXEDU	Durixeralf
AXEFR	Fragixeralf
AXEHA	Haploxeralf
AXENA	Natrixeralf
AXEPA	Palexeralf
AXEPN	Plinthoxeralf
AXERH	Rhodoxeralf
DARDU	Durargid
DARHA	Haplargid
DARND	Nadurargid
DARNT	Natrargid
DARPA	Paleargid
DORCL	Calciorthid
DORCM	Cambiorthid
DORDU	Durorthid
DORGY	Gypsiorthid
DORPA	Paleorthid
DORSA	Salorthid
EAQCR	Cryaquent
EAQFL	Fluvaquent
EAQHA	Haplaquent
EAQHY	Hyrdraquent
EAQPS	Psammaquent
EAQSU	Sulfaquent
EAQTR	Tropaquent
EARAR	Arent
EFLCR	Cryofluvent
EFLTO	Torrifluvent
EFLTR	Tropofluvent
EFLUD	Udifluvent
EFLUS	Ustifluvent
EFLXE	Xerofluvent
EORCR	Cryorthent
EORTO	Torriofluvent
EORTR	Troporthent
EORUD	Udorthent
EORUS	Ustorthent
EORXE	Xerorthent
EPSCR	Cryopsamment
EPSQU	Quartzipsamment
EPSTO	Torripsamment
EPSTR	Tropopsamment
EPSUD	Udipsamment
EPSUS	Ustipsamment
EPSXE	Xeropsamment
HFIBO	Borofibrist
HFICR	Cryofibrist
HFILU	Luvifibrist
HFIME	Medifibrist
HFISP	Sphagnofibrist
HFITR	Tropofibrist
HFOBO	Borofolist
HFOCR	Cryofolist
HFOTR	Tropofolist
HHEBO	Borohemist
HHECR	Cryohemist
HHELU	Luvihemist
HHEME	Medihemist
HHESI	Sulfihemist
HHESO	Sulfohemist
HHETR	Tropohemist
HSABO	Borosaprist
HSACR	Cryosaprist
HSAME	Medisaprist
HSATR	Troposaprist
IANCR	Cryandept
IANDU	Durandept
IANDY	Dystrandept
IANEU	Eutrandept
IANHY	Hydrandept
IANPK	Placandept
IANVI	Vitrandept
IAQAN	Andaquept
IAQCR	Cryaquept
IAQFR	Fragiaquept
IAQHL	Halaquept
IAQHP	Haplaquept
IAQHU	Humaquept
IAQPK	Placaquept
IAQPN	Plinthaquept
IAQSU	Sulfaquept
IAQTR	Tropaquept
IOCCR	Cryochrept
IOCDU	Durochrept
IOCDY	Dystrochrept
IOCEU	Eutrochrept
IOCFR	Fragiochrept
IOCUS	Ustochrept
IOCXE	Xerochrept
IPLPL	Plaggept
ITRDY	Dystropept
ITREU	Eutropept
ITRHU	Humitropept
ITRSO	Sombritropept
ITRUS	Ustropept
IUMCR	Cryumbrept
IUMFR	Fragiumbrept
IUMHA	Haplumbrept
IUMXE	Xerumbrept
MALAR	Argialboll
MALNA	Natralboll
MAQAR	Argiaquoll
MAQCA	Calciaquoll
MAQCR	Cryaquoll
MAQDU	Duraquoll
MAQHA	Haplaquoll
MAQNA	Natraquoll
MBOAR	Argiboroll
MBOCA	Calciboroll
MBOCR	Cryoboroll
MBOHA	Haploboroll
MBONA	Natriboroll
MBOPA	Paleboroll
MBOVE	Vermiboroll
MRERE	Rendoll
MUDAR	Argiudoll
MUDHA	Hapludoll
MUDPA	Paleudoll
MUDVE	Vermudoll
MUSAR	Argiudoll
MUSCA	Calciustoll
MUSDU	Durustoll
MUSHA	Haplustoll
MUSNA	Natrustoll
MUSPA	Paleustoll
MUSVE	Vermustoll
MXEAR	Argixeroll
MXECA	Calcixeroll
MXEDU	Durixeroll
MXEHA	Haploxeroll
MXENA	Natrixeroll
MXEPA	Palexeroll
OAQAC	Acraquox
OAQEU	Eutraquox
OAQHA	Haplaquox
OAQPN	Plinthaquox
OPRAC	Acroperox
OPREU	Eutroperox
OPRHA	Haploperox
OPRKA	Kandiperox
OPRSO	Sombriperox
OTOAC	Acritorrox
OTOEU	Eutrotorrox
OTOHA	Haplotorrox
OUDAC	Acrudox
OUDEU	Eutrudox
OUDHA	Hapludox
OUDKA	Kandiudox
OUDSO	Sombriudox
OUSAC	Acrustox
OUSEU	Eutrustox
OUSHA	Haplustox
OUDKA	Kandiustox
OUSSO	Sombriustox
SAQCR	Cryaquod
SAQDU	Duraquod
SAQFR	Fragiaquod
SAQHA	Haplaquod
SAQPK	Placaquod
SAQSI	Sideraquod
SAQTR	Tropaquod

APPENDIX A-1 (Continued)

SFEFE	Ferrod	UAQKH	Kandhaplaquult	UUDPA	Paleudult
SHUCR	Cryohumod	UAQOC	Ochraquult	UUDPN	Plinthudult
SHUFR	Fragihumod	UAQPA	Paleaquult	UUDRH	Rhodudult
SHUHA	Haplohumod	UAQPN	Plinthaquult	UUSHA	Haplustult
SHUPK	Placohumod	UAQUM	Umbraquult	UUSKA	Kandiustult
SHUTR	Tropohumod	UHUHA	Haplohumult	UUSKH	Kandhaplustult
SORCR	Cryorthod	UHUKA	Kandihumult	UUSPA	Paleustult
SORFR	Fragiorthod	UHUKH	Kandhaplohumult	UUSPN	Plinthustult
SORHA	Haplorthod	UHUPN	Plinthohumult	UUSRH	Rhodustult
SORPK	Placorthod	UHUSO	Sombrihumult	UXEHA	Haploxerult
SORTR	Troporthod	UUDFR	Fragiudult	UXEPA	Palexerult
UAQAL	Albaquult	UUDHA	Hapludult	VTOTO	Torrert
UAQFR	Fragiaquult	UUDKA	Kandiudult	VUDCH	Chromudert
UAQKA	Kandiaquult	UUDKH	Kandhapludult	VUDPE	Pelludert

PEDON CLASSIFICATION

SG	SUBGROUP				
AB	Abruptic	B006	Borollic	HA09	Hapludic
AB04	Abruptic aridic	B010	Borollic lithic	HA12	Hapludollic
AB08	Abruptic cryic	BO	Boralfic	HA16	Haplustollic
AB10	Abruptic haplic	BO04	Boralfic udic	HE	Hemic
AB14	Abruptic ultic	BO08	Borollic glossic	HE02	Hemic terric
AB16	Abruptic xerollic	BO12	Borollic vertic	HI	Histic
AE	Aeric	CA	Calcic	LI05	Lithic pergelic
AE03	Aeric arenic	CA04	Calic pachic	HI02	Histic lithic
AE05	Aeric grossarenic	CA06	Calciorthidic	HI06	Histic pergelic
AE06	Aeric humic	CA10	Calcixerollic	HU	Humic
AE08	Aeric mollic	CA20	Cambic	HU02	Humic lithic
AE09	Aeric tropic	CH	Chromic	HU05	Humic pergelic
AE10	Aeric umbric	AQ07	Aquic anionic	IN	Inceptic
AA	Typic	CR	Cryic	HU10	Humaqueptic
AL	Albaquic	CR10	Cryic lithic	HY	Hydric
AL02	Albaquultic	CR14	Cyric pachic	HY02	Hydric lithic
AL04	Albic	CU	Cumulic	LE	Leptic
AL08	Albic glossic	CU02	Cumulic udic	LI	Limnic
AL10	Alfic	CU04	Cumulic ultic	LI02	Lithic
AL12	Alfic arenic	DU	Durargidic	LI04	Lithic mollic
AL13	Alfic andeptic	DU02	Duric	LI06	Lithic ruptic-alphic
AL16	Alfic lithic	DU08	Durixerollic	LI07	Lithic ruptic-argic
AN	Andic	AN25	Anionic	LI08	Lithic ruptic-entic -xerollic
AN01	Andeptic	DU10	Durixerollic lithic	LI09	Lithic ruptic-entic
AN03	Andaquic	AQ11	Aqueptic	KA	Kandic
AN06	Andic dystric	DU12	Durothidic		
AN11	Andeptic glossoboric	DU14	Durorthidic xeric		
AN22	Andic ustic	DY02	Dystric		
AN24	Andaqueptic	DY03	Dystric entic		
AN30	Anthropic	DY04	Dystric fluventic		
AQ	Aqualfic	DY06	Dystric lithic		
AQ02	Aquentic	AN20	Andic udic		
AQ06	Aquic	EN	Entic		
AQ14	Aquic duric	EN02	Entic lithic		
AQ16	Aquic durorthidic	EN06	Entic ultic		
AQ18	Aquic dystric	EP	Epiaquic		
AQ24	Aquic haplic	AN08	Andic epiaquic		
AQ26	Aquic lithic	EU02	Eutrochreptic		
AQ28	Aquic petroferric	EU04	Eutropeptic		
AQ34	Aquollic	FE	Ferrudalfic		
AQ36	Aquultic	FI	Fibric		
AR	Arenic	FI02	Fibric terric		
AR04	Arenic plinthaquic	FL02	FLuvaquentic		
AR02	Arenic aridic	FL06	Fluventic		
AR06	Arenic plinthic	FL12	Fluventic umbric		
AR08	Arenic rhodic	FR10	Fragiaquic		
AR10	Arenic ultic	FR18	Fragic		
AR14	Arenic umbric	GL02	Glossaquic		
AR16	Arenuc ustalfic	GL04	Glossic		
AR18	Arenic ustollic	GL10	Glossic udic		
AR22	Argiaquic	GL12	Glossic ustollic		
AR24	Argiaquic xeric	GY	Gypsic		
AR26	Argic	GL16	Glossoboric		
AR28	Argic lithic	GR	Grossarenic		
AR30	Argic pachic	GR01	Grossarenic entic		
AR32	Argic vertic	GR04	Grossarenic plinthic		
AR34	Aridic	HA	Haplaquodic		
AR36	Aridic calcic	HU15	Humic rhodic		
AR42	Aridic duric	HA02	Haplic		
AQ08	Aquic arenic	HU20	Humic Xanthic		
AR52	Aridic petrocalcic	LI03	Lithic petrocalcic		
B002	Boralfic lithic	HA07	Haploxerollic		

APPENDIX A-1 (Continued)

LI11	Lithic ruptic-xerothentic
LI12	Lithic ultic
LI13	Lithic ruptic-ultic
LI14	Lithic umbric
LI15	Lithic ruptic-xerochreptic
LI16	Lithic ustic
LI18	Lithic ustollic
LI22	Lithic xeric
LI24	Lithic xerollic
MO	Mollic
NA06	Natric
OC	Ochreptic
OR	Orthidic
OR01	Orthic
OR02	Orthoxic
OX	Oxic
PA	Pachic
PA02	Pachic udic
PA04	Pachic ultic
KA02	Kandiudalfic
PA08	Paleustollic
PA10	Palexerollic
PE	Pergelic
PE01	Pergelic ruptic-histic
PE02	Pergelic sideric
PE04	Petrocalcic
PE06	Petrocalcic ustalfic
PE08	Petrocalcic ustollic
PE14	Petrocalcic xerollic
PE16	Petroferric
PE20	Petrogypsic
PK	Placic
PK10	Plaggeptic
PK12	Plaggic
PL	Plinthudic
PL04	Plinthic
PS	Psammaquentic
PS02	Psammentic
QU	Quartzipsammentic
RE	Rendollic
RH	Rhodic
RU02	Ruptic-alfic
RU09	Ruptic-lithic
RU11	Ruptic-lithic-entic
RU15	Ruptic-lithic-xerochreptic
RU17	Ruptic-ultic
RU19	Ruptic-vertic
SA	Salorthidic
SA02	Sapric
SA04	Sapric terric
SI	Sideric
SO	Sombric
SP	Sphagnic
SP02	Sphagnic terric
SP04	Spodic
SU	Suflic
TE	Terric
TH04	Thapto-histic
TH06	Thapto-histic tropic
TO02	Torrifluventic
TO04	Torriorthentic
TO06	Torripsammentic
TO10	Torroxic
TR	Tropaquodic
KA04	Kandiustalfic
TR04	Tropic
TO	Torrertic
UD	Udertic
UD01	Udalfic
UD02	Udic
UD03	Udollic
UD05	Udorthentic
KH	Kandhaplic
UL	Ultic
UM	Umbreptic
UM02	Umbric
US	Ustalfic
US02	Ustertic
US04	Ustic
US06	Ustochreptic
US08	UStollic
US12	Ustoxic
VE02	Vertic
VE	Vermic
XE	Xeralfic
XE02	Xerertic
XE04	Xeric
XE08	Xerollic
AQ04	Aqueptic
XA	Xanthic
PL06	Plinthudic
LE	Leptic
AC	Acric
AC05	Acric Plinthic

APPENDIX A-1 (Continued)

PEDON CLASSIFICATION

PSC	PARTICLE SIZE CLASS
010	Medial
102	Fine-loamy over clayey
108	Fine-silty over fragmental
011	Medial-skeletal
110	Fine-silty over sandy or sandy-skeletal
112	Fine-silty over clayey
114	Clayey
116	Clayey over fragmental
118	Clayey over sandy or sandy-skeletal
012	Medial over cindery
120	Clayey over loamy-skeleta
122	Clayey over fine-silty
124	Clayey over loamy
126	Fine
013	Ashy over loamy-skeletal
134	Very fine
014	Medial over clayey
015	Cindery over medial-skeletal
016	Medial over fragmental
017	Cindery over medial
018	Medial over loamy
019	Ashy over medial
020	Medial over loamy-skeletal
022	Medial over sandy or sandy-skeletal
024	Medial over thixotropic
026	Thixotropic
027	Thixotropic-skeletal
028	Thixotropic over fragmental
030	Thixotropic over sandy or sandy-skeletal
032	Thixotropic over loamy-skeletal
034	Thixotropic over loamy
036	Fragmental
004	Cindery over sandy or sandy-skeletal
044	Sandy-skeletal
046	Sandy-skeletal over loamy
047	Sandy-skeletal over clayey
005	Ashy
050	Loamy-skeletal
051	Loamy-skeletal over fragmental
052	Loamy-skeletal over sandy
054	Loamy-skeletal over clayey
056	Clayey-skeletal
058	Clayey-skeletal over sandy
006	Cindery over loamy
062	Sandy
063	Sandy over sandy-skeletal
064	Sandy over loamy
066	Sandy over clayey
068	Loamy
007	Ashy over cindery
072	Loamy over sandy or sandy-skeletal
008	Ashy over loamy
080	Coarse-loamy
084	Coarse-loamy over sandy or sandy-skeletal
086	Coarse-loamy over clayey
088	Coarse-silty
009	Ashy-skeletal
003	Cindery
090	Coarse-silty over fragmental
092	Coarse-silty over sandy or sandy-skeletal
094	Coarse-silty over clayey
096	Fine-loamy
098	Fine-loamy over fragmental
082	Coarse-loamy over fragmental
097	Fine-loamy over cindery
100	Fine-loamy over sandy or sandy-skeletal
106	Fine-silty

PEDON CLASSIFICATION

MIN	MINEROLOGY CLASS
03	illitic
05	carbonatic
16	ferruginous
08	coprogenous
10	diatomoaceous
12	ferrihumic
14	ferritic
18	gibbsitic
47	siliceous (calcareous)
20	glauconitic
22	gypsic
24	halloysitic
26	illitic
27	illitic (calcareous)
28	kaolinitic
30	marly
32	micaceous
34	mixed
35	mixed (calcareous)
37	montmorillonitic
38	montmorillonitic (calcareous)
40	oxidic
44	serpentinitic
46	siliceous
50	vermiculitic
09	chloritic

PEDON CLASSIFICATION

TMP	SOIL TEMPERATURE
10	isohyperthermic
12	isomesic
14	isothermic
16	mesic
18	thermic
04	frigid
06	hyperthermic
08	isofrigid

PEDON CLASSIFICATION

RX	SOIL REACTION
10	euic
12	nonacid
14	noncalcareous
06	allic
04	acid
08	dysic

PEDON CLASSIFICATION

OTH	OTHER
12	ortstein
14	shallow
15	shallow & coated
16	sloping
17	shallow & uncoated
20	uncoated
04	coated
05	cracked
06	level
08	micro

2. Site form

Pennsylvania State Unviersity
Soil Characterizaton Laboratory

SOIL NUMBER SITE PAGE 1 OF 1

SOIL SERIES	DATE MO/DA/YR	SITE ID ST CNT UNI S	MLRA	LATITUDE DEG MIN SEC DIR	LONGITUDE DEG MIN SEC DIR
	/ /	PA		N	W

ID	SYMB	NOTE ID	TRAN ID	YLD ID	PHOTO#	SAMPLE #	DT	PT	PREVIOUS NAME
						-			

SLP %	SHP U A	G M S	H ASP DEG	SLP LENGTH ABOVE	SLP LENGTH TOTAL	MICRO K A P	SLP POS	PHYS PRI SEC	PEDON CLASSIFICATION O SO GG SG PSC MIN RX TMP OTH

PRECIP	WATERTABLE DEPH	WATERTABLE DAYS	WATERTABLE KD	L U	S T	H C	D R	ELEV	1 PARENT W M OR	2 PARENT W M OR	3 MATERIAL W M OR	4 MATERIAL W M OR	BEDROCK BRD	BEDROCK BRS	BEDROCK BRF

AVG AIR TEMP ANN	AVG AIR TEMP SUM	AVG AIR TEMP WIN	AVG SOIL TEMP ANN	AVG SOIL TEMP SUM	AVG SOIL TEMP WIN	MOS REG	WEATHER STN #	CONTROL SEC	CONTROL DEP	ER WA	RN OF
.	.	.	.	.	.			-			

DIAGNOSTIC FEATURES

DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND	DEPTH KND

FLOODING FRQ	FLOODING MO	FLOODING DAYS	PONDING FRQ	PONDING MO	PONDING DAYS

PERM

VEGETATION SPECIES

1	2	3	4	5
6	**7**	**8**	**9**	**10**

PA PARMAT

PLOWED

GEOGRAPHICALLY ASSOCIATED SOILS

1	2
3	**4**

TOWNSHIP _____ USGS 7.5' QUAD _____

DESCRIBERS NAMES

DESCRIPTION LOCATION

NOTES

PENNSYLVANIA STATE UNIVERSITY
SOIL CHARACTERIZATION LABORATORY
LISTING OF HORIZON CODES
APRIL 11, 1991

COLOR

LO	LOCATION
0	not given
1	matrix
2	ped faces
3	crushed
4	dithionite-citrate pretreated
5	after exposure to air
6	after ignition
7	pyrophosphate extract
8	prism faces
9	zone just inside prism face

TEXTURE CLASS

C	clay
CE	coprogenous earth
CIND	cinders
CL	clay loam
COS	coarse sand
COSL	coarse sandy loam
CSCL	coarse sandy clay loam
DE	diatomaceous earth
DOM	decomposed organic matter (sapric)
FB	fibric material
FM	fragmental material
FS	fine sand
FSL	fine sandy loam
G	gravel
GYP	gypsiferous earth
HM	hemic material
ICE	ice or frozen soil
L	loam
LCOS	loamy coarse sand
LFS	loamy fine sand
LS	loamy sand
LVFS	loamy very fine sand
MARL	marl
MPT	mucky peat
MUCK	muck
OPWD	oxide protected weathered rock
PDOM	partially decomposed organic material (hemic)
PEAT	peat
S	sand
SC	sandy clay
SCL	sandy clay loam
SG	sand and gravel
SI	silt
SIC	silty clay
SICL	silty clay loam
SIL	silt loam
SL	sandy loam
SP	sapric material
U	unkown texture
UDOM	undecomposed organic material (fibric)
UWB	unweathered bedrock
VAR	variable
VFS	very fine sand
VFSL	very fine sandy loam
WB	weathered bedrock

TEXTURE

MOD	MODIFIER
BY	bouldery
BYV	very bouldery
BYX	extremely bouldery
CB	cobbly
CBV	very cobbly
CBX	extremely cobbly
CN	channery
CNV	very channery
CNX	extremely channery
CR	cherty
CRC	coarse cherty
CRV	very cherty
CRX	extremely cherty
CVA	angular cobbly
FL	flaggy
FLV	very flaggy
FLX	extremely flaggy
GR	gravelly
GRC	coarse gravelly
GRF	fine gravelly
GRV	very gravelly
GRX	extremely gravelly
GY	gritty
GYV	very gritty
GYX	extremely gritty
HV	heavy
LT	light
MK	mucky
PT	peaty
SH	shaly
SHV	very shaly
SHX	extremely shaly
SR	stratified
ST	stony
STV	very stony
STX	extremely stony
SY	slaty
SYV	very slaty
SYX	extremely slaty

ROCK FRAGMENT MOD

<15%	none
15-35%	class name
35-60%	very + name
>60%	extremely + name

APPENDIX A-3 (Continued)

Pennsylvania State University
Soil Characterization Laboratory

SOIL NUMBER HORIZON

	DEPH UP LOW	D T S	HORIZON MASI LETT	SUFX	VOL% LAI TOT	THICK NESS		DRY COLOR O	%	HUE	V	C	MOIST COLOR O	%	HUE	V	C	TEXTURE CLASS	MOD
1	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---
2	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---
3	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---
4	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---
5	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---
6	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---
7	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---
8	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---
9	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---
10	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---
11	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---
12	--- ---	-	---	----	-- --	a b c	--- --- ---	- - -	-- -- --	----- ----- -----	- - -	- - -	- - -	-- -- --	----- ----- -----	- - -	- - -	---- ----	--- ---

APPENDIX A-3 (Continued)

STRUCTURE

GR	GRADE
0	structureless
1	weak
2	moderate
3	strong
4	very strong
5	weak & moderate
6	moderate & strong
7	structureless to weak
8	weak to moderate
9	moderate to strong

STRUCTURE

SZ	SIZE
CO	coarse
CV	coarse & very coarse
F	fine
FF	very fine and fine
FM	fine and medium
M	medium
MC	medium & coarse
TK	thick
TN	thin
VC	very coarse
VF	very fine
VK	very thick
VN	very thin

STRUCTURE

SHP	SHAPE
ABK	angular blocky structure
BK	blocky structure
COL	columnar struc.
CR	crumb structure
GR	granular structure
MA	massive
PL	platy structure
PR	prismatic struc.
SBK	subangular blocky structure
SGR	single grain

use lower case letters with 2nd structure shape to indicate parts to

CONSISTENCE

M	MOIST
EFI	extremely firm
FI	firm
FR	friable
L	loose
VFI	very firm
VFR	very friable

CONSISTENCE

D	DRY
EH	extremely hard dry
H	hard dry
L	loose dry
S	soft dry
SH	slightly hard dry
VH	very hard dry

CONSISTENCE

O	OTHER
B	brittle
CO	uncemented
D	deformable
I	indurated
MS	moderately smeary
R	rigid
SC	strongly cemented
SD	semi deformable
SM	smeary
VR	very rigid
VWC	very weakly cemented
WC	weakly cemented
WSM	weakly smeary

CONSISTENCE

ST	STICKINESS
S	moderately sticky
SO	non sticky
SS	slightly sticky
VS	very sticky

CONSISTENCE

PL	PLASTICITY
P	moderately plastic
PO	non plastic
SP	slightly plastic
VP	very plastic

CONSISTENCE

CEM	CEMENTATION
H	humus cemented
I	iron cemented
L	lime cemented
S	silica cemented
X	lime and silica cemented

RUPTURE RESISTENCE

RUP	
ES	extremely strong
EW	extremely weak
M	moderate
S	strong
VS	very strong
VW	very weak
W	weak

PENETRATION RESISTENCE

PENT	
H	high micro-penetrometer resistence
L	low micro-penetrometer resistence
M	moderate micro-penetrometer resistence
VH	very high micro-penetrometer resistence
VL	very low micro-penetrometer resistence

MOTTLES

AB	ABUNDANCE
C	common (or percent cover)
F	few (or percent cover)
M	many (or percent cover)

MOTTLES

SZ	SIZE
1	fine
12	fine & medium
2	medium
23	medium & coarse
3	coarse

MOTTLES

CT	CONTRAST
D	distinct
F	faint
P	prominent

SURFACE FEATURES

KD	KIND
A	skeletans over cutans
B	black stains
C	chalcedony or opal
D	clay bridging
G	gibbsite coats
I	iron stains
K	intersecting slickensides
L	lime or carbonate coats
M	iron-manganese coatings
O	organic coatings
P	pressure faces
Q	nonintersecting slickensides
S	skeletans (sand or silt)
T	clay films
U	coatings
V	thin clay films
W	moderately thick clay films
X	oxide coats
Z	thick clay films

SURFACE FEATURES

AB	ABUNDANCE
C	common (or percent cover)
F	few (or percent cover)
M	many (or percent cover)
V	very few (or percent cover)

SURFACE FEATURES

CN	CONTINUITY
C	continuous
D	discontinuous
P	patchy

SURFACE FEATURES

DI	DISTINCTNESS
D	distinct
F	faint
P	prominent

SURFACE FEATURES

LO	LOCATION
B	between sand grains
C	on tops of columns
F	on faces of peds and in pores
H	on horizontal faces of peds
I	in root channels and/or pores
J	in pores
L	on lower surfaces of peds or stones
M	on bottoms of plates
N	on nodules
P	on faces of peds
R	on rock fragments
S	on sand and gravel
T	throughout
U	on upper surfaces of peds or stones
V	on vertical faces of peds
Z	on vertical and horizontal faces of peds

BOUNDARY

BOU D	DISTINCNESS
A	abrupt
C	clear
D	diffuse
G	gradual

BOUNDARY

BOU T	TOPOGRAPHY
B	broken boundary
I	irregular boundary
S	smooth boundary
W	wavy boundary

APPENDIX A-3 (Continued)

Pennsylvania State University
Soil Characterization Laboratory

SOIL NUMBER HORIZON PAGE 2 OF 4

	STRUCTURE			CONSISTENCE					RUP	MOTTLES						SURFACE FEATURES								BOU	
	GR	SZ	SHP	MOIST DRY	OTH	STICKY PLASTIC		CEM	PENT	AB	SZ	CT	HUE	V	C	KD	AB	CN	DI	LO	HUE	V	C	D	T
1	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		
2	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		
3	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		
4	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		
5	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		
6	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		
7	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		
8	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		
9	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		
10	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		
11	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		
12	-	--	---	M	---	ST	--		--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-		
	-	--	---	D	---	PL	--	-	--	--	--	-	-----	-	-	-	--	-	-	-	-----	-	-	-	-
	-	--	---	O	---								-----	-	-	-	--	-	-	-	-----	-	-		

APPENDIX A-3 (Continued)

EFFER C	EFFERVESCENT CLASS
0	v. slightly efferv.
1	slightly efferv.
2	strongly efferv.
3	violently efferv.

EFFER A	EFFERVESCENT AGENT
H	in HCL
I	in 1 normal HCL
O	in 3-4% H2O2
P	in H2O2

EFFER E	EFFERVESCENT EXTENT
C	continuous
D	discontinuous

FLD MSR PROP KD	FIELD MEASURED PROPERTY KIND
CL	clay
GF	wt. pct. <20 mm base 5-2 mm fragments
GM	wt. pct. <20 mm base 20-5 mm fragments
GW	wt. pct. <20 mm base 20-2 mm fragments
OB	fiber unrubbed
OR	rubbed fiber
PB	bromthymol blue pH
PC	cresol red pH
PG	bromcresol green pH
PH	pH
PL	LaMotte-Morgan pH
PM	1:1 water meter pH
PN	1:2 CaCl2 meter pH
PP	phenol red pH
PR	chlorophenol red pH
PS	soiltest pH
PT	thymol-blue pH
PY	pH Ydrion
PZ	unspecified meth. pH
S2	pct. passing # 200 sieve
S4	pct. passing # 40 sieve
SA	sand
SC	coa. & v. coa. sand
SF	fine sand
SI	silt
SM	medium sand
SV	very fine sand

WET	WETNESS CLASS
D	dry wetness class
M	moist wet. class
W	wet wet. class

HYDRAULIC CONDUCTIVITY (HC) HYC	CLASS
1	very low HC
2	low HC
3	moder. low HC
4	moder. high HC
5	high HC
6	very high HC

ROOTS QT	QUANTITY
C	common (1 to 5 / 1 or 10 sq cm)
CM	common to many
F	few (< 1 / 1 or 10 sq cm)
FC	few to common
FF	very few to few
M	many (> 5 / 1 or 10 sq cm)
VF	very few

SZ	ROOTS - SIZE
1	fine 1-2 mm
11	v. fine & fine
12	fine & med.
13	fine to coarse
2	medium 2-5 mm
23	medium & coarse
3	coarse 5-10 mm
4	v. coa. > 10 mm

LO	ROOT LOCATION
C	in cracks
M	mat - top of horiz.
P	between peds
S	mat around stones
T	throughout

PORES SH	SHAPE
IE	pores filled with coarse material
IF	void betw. rock frag.
IR	interstitial pores
IT	interstit. & tubul.
TC	contin. tubular
TD	discont. tubular
TE	dendritic tubular
TS	constricted tubular pores
TU	tubular pores
VS	vesicular pores
VT	vesicul. & tubular

QT	PORE QUANTITY
C	common
CM	common to many
F	few
FC	few to common
FF	very few to few
M	many
VF	very few

SZ	PORE SIZE
1	fine 0.05-2mm
11	very fine and fine
12	fine and medium
13	fine to coarse
2	medium 2-5mm
23	medium & coarse
3	coarse 5-10mm
4	v. coa. > 10mm
V1	very fine

CN	PORE CONTIN.
H	high continuity
L	low continuity
M	moderate contin.

CONCENTRATIONS KD	KIND
A2	clay bodies
B1	barite crystals
B2	soft masses- barite
C1	calcite crystals
C2	soft masses-lime
C3	line concretions
C4	lime nodules
D1	mica flakes
D2	soft dark masses
D3	dark concretions
D4	dark nodules
E3	gibbsite concr.
E4	gibbsite nodules
F1	plinthite segreg.
F2	soft masses-iron
F3	iron concretions
F4	ironstone nodules
G1	gypsum crystals
G2	masses-gypsum
G3	nests of gypsum
G4	gypsum threads
H1	halite crystals
H2	salt masses
K2	masses- carbonate
K3	carbonate concr.
K4	carbonate nodules
K5	carbonate threads
M1	nonmagnetic shot
M2	soft masses Fe-Mn
M3	Fe-Nn concret.
M4	magnetic shot
S1	opal crystals
S2	soft masses silica
S3	silica concretions
S4	durinodes
T2	worm casts
T3	insects casts
T4	worm nodules

CONCENTRAT QT	QUANTITY
C	common
F	few
M	many

CONCENTRAT SH	SHAPE
C	cylindrical
O	rounded
P	plate like
Z	irregular

CONCENTRAT SZ	SIZE
1	fine < 2mm
12	fine and medium
2	medium 2-5mm
23	medium & coarse
3	coarse 5-20mm
34	coa. & v. coa.
4	v coa. 20-76mm
45	v coa & extr coa
5	extr coa >76mm

ROCK FRAGMENTS RO	ROUNDNESS
1	angular
2	subangular
3	subrounded
4	rounded
5	well rounded

ROCK FRAGMENTS SZ	SIZE
10	gravel 2-76 mm
11	flat grav 2-76 mm
12	gravel 2-19 mm
13	flat grav 2-19 mm
14	gravel 19-76 mm
15	flat grav 19-76 mm
20	cobbles 7.6-25 cm
21	flat cobbles 7.6-25 cm
30	stones 25-60 cm
31	flat stones 25-60 cm
40	boulders >60 cm
41	flat boulders >60 cm
50	channers 2-150 mm
60	flagstones 15-38 cm
70	stones 38-60 cm
80	> 7.6 cm
81	> 25 cm
RF	rock fragments

for total rock fragment content use KD, % and RF (under SZ) in first blank

ROCK FRAGMENTS KD	KIND
A0	sandstone
A1	noncalc. sandstone
A2	arkosic sandstone
A4	calcar. sandstone
A5	red acid sandstone
A6	gray & brown acid sandstone
B0	interbedded sedimentary
B1	limestone, sandstone & shale
B2	limestone & sandstone
B3	limestone & shale
B4	limestone & siltstone
B5	sandstone & shale
B6	sandstone & siltstone
B7	shale & siltstone
B8	shale & sandstone
C0	conglomerate
C1	noncalc. conglom.
C2	calcar. conglom.
E0	ejecta ash
E1	acidic ash
E2	basic ash
E3	basaltic ash
E4	andesitic ash
E5	cinders
E6	pumice
E7	scoria
E8	volcanic bombs
H0	shale
H1	noncalcar. shale
H2	calcareous shale
H3	clay shale
H4	red acid shale
H5	gray-brown acid shale
H6	red calc. shale
I0	igneous
I1	coarse igneous
I2	basic igneous
I3	intermed. igneous
I4	granite
I5	fine igneous
I6	diabase or basalt
I7	andesite
I8	acid igneous rock
I9	ultrabasic igneous

APPENDIX A-3 (Continued)

Pennsylvania State University
Soil Characterization Laboratory

SOIL NUMBER HORIZON PAGE 3 OF 4

	EFFERC	EFFERA	EFFERE	FLD MSR PROP KD	FLD MSR PROP AMT	FLD MSR PROP KD	FLD MSR PROP AMT	WEAT	HYDC	ROOTS QTY	ROOTS SIZ	ROOTS LOC	PORES SHP	PORES QTY	PORES SIZ	PORES CON	CONCENTRAT KD	CONCENTRAT QTY	CONCENTRAT SHP	CONCENTRAT SIZ	ROCK FRAGMENTS KD	ROCK FRAGMENTS %	ROCK FRAGMENTS LOC	ROCK FRAGMENTS SIZ	RF KD	RF %	RF LOC	RF SIZ
1																												
2																												
3																												
4																												
5																												
6																												
7																												
8																												
9																												
10																												
11																												
12																												

APPENDIX A-3 (Continued)

K0	organic	L8	very cherty limestone	O4	gray hornfelts	T2	calcareous siltstone
K1	mossy material			P0	pyroclastic		
K2	herbaceous mat.	L9	chert	P1	tuff	T3	red acid siltstone
K3	woody material	M0	metamorphic	P2	acidic tuff	T4	gray & brown acid siltstone
K4	wood fragments	M1	gneiss	P3	basic tuff		
K5	logs and stumps	M2	acidic gneiss	P4	volcanic breccia	Y0	mixed lithology
K6	charcoal	M3	basic gneiss	P5	acidic breccia	Y1	noncalcareous mixed
K7	coal	M4	serpentine	P6	basic breccia		
L0	limestone	M5	phyllite	P7	tuff breccia	Y2	calcareous mixed
L1	chalk	M6	acid schist	P8	aa	Y4	mixed igneous metamorphic & sedimentary
L2	marble	M7	basic schist	P9	pahoehoe		
L3	dolomite	M8	slate	S0	sedimentary		
L4	phosphatic limestone	M9	quartzite	S1	marl	Y5	mixed igneous & metamorphic
		O0	metarhyolite	S2	glauconite		
L5	v. sandy limestone	O1	quartz	T0	siltstone	Y6	mixed igneous & sedimentary
L6	argillaceous limestone	O2	graphitic schist	T1	noncalcareous siltstone	Y7	mixed metamorphic & sedimentary
		O3	mica schist				
L7	cherty limestone						

COLOR CODES

10B 2/1	10YR 8/4	5GY 7/1	5YR 7/8
10B 5/1	10YR 8/6	5Y 2/1	5YR 8/1
10BG 6/1	10YR 8/8	5Y 2/2	5YR 8/2
10R 2/1	2.5Y 2/2	5Y 3/1	5YR 8/3
10R 2/2	2.5Y 3/1	5Y 3/2	5YR 8/4
10R 2/3	2.5Y 3/2	5Y 4/1	7.5YR 2/1
10R 3/1	2.5Y 3/4	5Y 4/2	7.5YR 2/2
10R 3/2	2.5Y 4/1	5Y 4/3	7.5YR 2/4
10R 3/3	2.5Y 4/2	5Y 4/4	7.5YR 3/1
10R 3/4	2.5Y 4/3	5Y 4/5	7.5YR 3/2
10R 3/6	2.5Y 4/4	5Y 4/6	7.5YR 3/3
10R 4/1	2.5Y 4/6	5Y 5/1	7.5YR 3/4
10R 4/2	2.5Y 5/1	5Y 5/2	7.5YR 4/1
10R 4/3	2.5Y 5/2	5Y 5/3	7.5YR 4/2
10R 4/4	2.5Y 5/3	5Y 5/4	7.5YR 4/3
10R 4/6	2.5Y 5/4	5Y 5/6	7.5YR 4/4
10R 4/8	2.5Y 5/6	5Y 6/1	7.5YR 4/5
10R 5/1	2.5Y 6/1	5Y 6/2	7.5YR 4/6
10R 5/2	2.5Y 6/2	5Y 6/3	7.5YR 4/8
10R 5/3	2.5Y 6/4	5Y 6/4	7.5YR 4/9
10R 5/4	2.5Y 6/6	5Y 6/6	7.5YR 5/1
10R 5/6	2.5Y 6/8	5Y 6/8	7.5YR 5/2
10R 5/8	2.5Y 7/1	5Y 7/1	7.5YR 5/3
10R 6/1	2.5Y 7/2	5Y 7/2	7.5YR 5/4
10R 6/2	2.5Y 7/4	5Y 7/3	7.5YR 5/6
10R 6/3	2.5Y 7/6	5Y 7/4	7.5YR 5/8
10R 6/4	2.5Y 7/8	5Y 7/6	7.5YR 6/2
10R 6/6	2.5Y 8/2	5Y 7/8	7.5YR 6/3
10R 6/8	2.5Y 8/4	5Y 8/1	7.5YR 6/4
10YR 2/1	2.5Y 8/6	5Y 8/2	7.5YR 6/5
10YR 2/2	2.5Y 8/8	5Y 8/3	7.5YR 6/6
10YR 2/3	2.5YR 2/2	5Y 8/4	7.5YR 6/8
10YR 3/1	2.5YR 2/4	5Y 8/6	7.5YR 7/1
10YR 3/2	2.5YR 2/6	5Y 8/8	7.5YR 7/2
10YR 3/3	2.5YR 2/8	5YR 2/1	7.5YR 7/3
10YR 3/4	2.5YR 3/2	5YR 2/2	7.5YR 7/4
10YR 3/6	2.5YR 3/4	5YR 3/1	7.5YR 7/6
10YR 4/1	2.5YR 3/6	5YR 3/2	7.5YR 7/8
10YR 4/2	2.5YR 4/2	5YR 3/3	7.5YR 8/2
10YR 4/3	2.5YR 4/3	5YR 3/4	7.5YR 8/4
10YR 4/4	2.5YR 4/4	5YR 3/5	7.5YR 8/6
10YR 4/5	2.5YR 4/6	5YR 4/1	N 1/0
10YR 4/6	2.5YR 4/8	5YR 4/2	N 2/0
10YR 5/1	2.5YR 5/2	5YR 4/3	N 3/0
10YR 5/2	2.5YR 5/4	5YR 4/4	N 4/0
10YR 5/3	2.5YR 5/6	5YR 4/5	N 5/0
10YR 5/4	2.5YR 5/8	5YR 4/6	N 6/0
10YR 5/5	2.5YR 6/2	5YR 4/7	N 7/0
10YR 5/6	2.5YR 6/4	5YR 4/8	N 8/0
10YR 5/7	2.5YR 6/5	5YR 5/1	
10YR 5/8	2.5YR 6/6	5YR 5/2	
10YR 5/9	2.5YR 6/8	5YR 5/3	
10YR 6/1	2.5YR 7/1	5YR 5/4	
10YR 6/2	2.5YR 7/2	5YR 5/5	
10YR 6/3	2.5YR 7/6	5YR 5/6	
10YR 6/4	5B 4/1	5YR 5/7	
10YR 6/5	5B 5/1	5YR 5/8	
10YR 6/6	5BG 4/1	5YR 6/1	
10YR 6/8	5BG 4/2	5YR 6/2	
10YR 7/1	5BG 5/1	5YR 6/3	
10YR 7/2	5G 4/1	5YR 6/4	
10YR 7/3	5G 4/2	5YR 6/6	
10YR 7/4	5G 5/2	5YR 6/8	
10YR 7/6	5G 6/1	5YR 7/1	
10YR 7/8	5G 6/2	5YR 7/2	
10YR 8/1	5GY 4/1	5YR 7/3	
10YR 8/2	5GY 5/1	5YR 7/4	
10YR 8/3	5GY 6/1	5YR 7/6	

APPENDIX A-3 (Continued)

Pennsylvania State University
Soil Characterization Laboratory

SOIL NUMBER HORIZON PAGE 4 OF 4

	FREE FORM HORIZON NOTES:
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	

APPENDIX B. Structure and Description Files for the Pedon Program

B-1. Site Data Structure and Description (SITEDATA.S&D)

Variable	Variable Type	Variable Length	Variable Dec.	SITEDATA.S&D Description
SERIESNAME	C	18	0	Current soil series name
CLASSTAX	C	1	0	Taxadjunct or variant(T or V code)
DATE	C	8	0	Date described
STATE	C	2	0	State abbreviation(PA,NY,NE etc.)
COUNTY	C	3	0	County code number(001 to 067 for PA)
UNIT	C	3	0	Pedon number within the county(001 to 999)
SUBUNIT	C	1	0	Unique subdivision
HORIZCOUNT	N	2	0	Number of horizons in the pedon
MLRA	C	3	0	Major land resource area number
MLRASUB	C	1	0	Major land resource area number subscript
LATITUDE	C	7	0	Latitude in degrees, minutes, seconds; direction
LONGITUDE	C	8	0	Longitude in degrees, minutes, seconds; direction
SURVEYID	C	3	0	Soil survey area identification number
MAPUNITSYM	C	5	0	Map unit symbol for map unit where pedon was collected
NOTEID	C	5	0	Identification number for notes
TRANSECTID	C	5	0	Identification number for transect data stop; number of transect; actual interval between transects
YIELDID	C	5	0	Identification number for yield data
PHOTONUM	C	5	0	Aerial photograph number
LABSAMPLE	C	13	0	Soil Characterization laboratory sample storage number
DESCTYPE	C	2	0	Code for the reason for the description
PEDONTYPE	C	2	0	Code for what the pedon represents
PREVSNAME	C	16	0	Series name when sampled
PRCNTSLOPE	C	3	0	Percent slope at this site
SLOPESHAPE	C	2	0	Code for shape of the slope up and down and across slope
GEOMORPCO	C	1	0	Code for geomorphic slope component
HILLSLOPEC	C	1	0	Code for hillslope component
SLOPEASPCT	C	3	0	Slope aspect(0 to 360 degrees)
SLOPLNGABV	C	4	0	Slope length from crest to site (meters)
SLOPLNGTOT	C	4	0	Total slope length (meters)
MICROREKND	C	1	0	Code for kind of microrelief
MICROREAMT	C	1	0	Code for vertical change in microrelief
MICROREPAT	C	1	0	Code for pattern of microrelief
PDNPOSITON	C	1	0	Code for relative position of the site on slope
REGNLPHYS	C	2	0	Code for major landform
LOCALPHYS	C	2	0	Code for local landform
ORDER	C	1	0	Code for soil taxonomy order
SUBORDER	C	2	0	Code for soil taxonomy suborder
GREATGROUP	C	2	0	Code for soil taxonomy great group
SUBGROUP	C	4	0	Code for soil taxonomy subgroup
PARTSIZECL	C	3	0	Code for soil taxonomy particle size class
MINERALOGY	C	2	0	Code for soil taxonomy mineralogy class
REACTION	C	2	0	Code for soil taxonomy reaction class
TEMPERATUR	C	2	0	Code for soil taxonomy temperature regime
OTHER	C	2	0	Code for soil taxonomy other family type

APPENDIX B (Continued)

Variable	Type	Length	Dec.	Description
	--- Variable ---			SITEDATA.S&D
PRECIPCM	C	3	0	Annual precipitation at site in centimeters
WATERDEPTH	C	3	0	Depth of water table when described in centimeters
WATERDAYS	C	3	0	Duration of water table in days
WATERKIND	C	1	0	Code for kind of water table
LANDUSE	C	1	0	Code for kind of landuse
STONINESS	C	2	0	Percent surface cover of rocks or stoniness class code
HYDRALCOND	C	1	0	Code for hydraulic conductivity class
PERMEABLTY	C	1	0	Code for permeability class
DRAINAGE	C	1	0	Code for drainage class
ELEVATION	C	5	0	Elevation above mean sea level in meters
PM1WEATHER	C	1	0	Code for parent material weathering intensity
PM1MODEDEP	C	1	0	Code for parent material mode of deposition
PM1ORIGIN	C	2	0	Code for bedrock source of parent material
PM2WEATHER	C	1	0	Code for parent material weathering intensity
PM2MODEDEP	C	1	0	Code for parent material mode of deposition
PM2ORIGIN	C	2	0	Code for bedrock source of parent material
PM3WEATHER	C	1	0	Code for parent material weathering intensity
PM3MODEDEP	C	1	0	Code for parent material mode of deposition
PM3ORIGIN	C	2	0	Code for bedrock source of parent material
PM4WEATHER	C	1	0	Code for parent material weathering intensity
PM4MODEDEP	C	1	0	Code for parent material mode of deposition
PM4ORIGIN	C	2	0	Code for bedrock source of parent material
BEDRCKDIP	C	2	0	Bedrock dip in degrees(from horizontal; 0 to 90) (
BEDRCKSTRK	C	3	0	Bedrock strike in degrees(0 to 360)
BEDRCKFRAC	C	1	0	Code for bedrock fracture
AIRTMPANN	C	4	1	Average annual air temperature degrees C
AIRTMPSUMR	C	4	1	Average summer air temperature degrees C
AIRTMPWNTR	C	4	1	Average winter air temperature degrees C
TEMPANNUAL	C	4	1	Average annual soil temperature degrees C
TEMPSUMMER	C	4	1	Average summer soil temperature degrees C
TEMPWINTER	C	4	1	Average winter soil temperature degrees C
MOISTUREGI	C	2	0	Code for soil taxonomy moisture regime
WTHRSTATN	C	6	0	U.S. weather station number for representative weather station
CONTRLSECT	C	6	0	Particle size control section upper and lower depth in centimeters
WATEROSION	C	1	0	Code for water erosion
RUNNOFF	C	1	0	Code for runoff
DH1DEPTH	C	6	0	Soil taxonomy diagnostic horizon - depth in cm
DH1KIND	C	1	0	Soil taxonomy diagnostic horizon - kind
DH2DEPTH	C	6	0	Soil taxonomy diagnostic horizon - depth in cm
DH2KIND	C	1	0	Soil taxonomy diagnostic horizon - kind
DH3DEPTH	C	6	0	Soil taxonomy diagnostic horizon - depth in cm
DH3KIND	C	1	0	Soil taxonomy diagnostic horizon - kind
DH4DEPTH	C	6	0	Soil taxonomy diagnostic horizon - depth in cm
DH4KIND	C	1	0	Soil taxonomy diagnostic horizon - kind
DH5DEPTH	C	6	0	Soil taxonomy diagnostic horizon - depth in cm
DH5KIND	C	1	0	Soil taxonomy diagnostic horizon - kind
FLOODFRQ	C	2	0	Code for frequency of flooding
FLOODMONTH	C	2	0	Beginning month of flooding
FLOODDAYS	C	2	0	Duration of flooding in days

APPENDIX B (Continued)

Variable	Variable Type	Variable Length	Variable Dec.	SITEDATA.S&D Description
PONDFRQ	C	2	0	Code for frequency of ponding
PONDMONTH	C	2	0	Beginning month of ponding
PONDDAYS	C	2	0	Duration of ponding in days
VEG1SPECIE	C	6	0	Code for vegetation species
VEG2SPECIE	C	6	0	Code for vegetation species
VEG3SPECIE	C	6	0	Code for vegetation species
VEG4SPECIE	C	6	0	Code for vegetation species
VEG5SPECIE	C	6	0	Code for vegetation species
VEG6SPECIE	C	6	0	Code for vegetation species
VEG7SPECIE	C	6	0	Code for vegetation species
VEG8SPECIE	C	6	0	Code for vegetation species
VEG9SPECIE	C	6	0	Code for vegetation species
VEG10SPEC	C	6	0	Code for vegetation species
ASSOCSOIL1	C	16	0	Name of associated soil on landscape
ASSOCSOIL2	C	16	0	Name of associated soil on landscape
ASSOCSOIL3	C	16	0	Name of associated soil on landscape
ASSOCSOIL4	C	16	0	Name of associated soil on landscape
DSCRBRSNMS	C	150	0	Names of describers
LOCATION	C	254	0	Location of pedon, free form description
NOTES1	C	254	0	Free form site notes
NOTES2	C	254	0	Free form site notes
QUADSHEET	C	20	0	USGS 7 1/2 minute topographic map name
TOWNSHIP	C	20	0	Township name
PAPARMAT	C	5	0	Code for Penn State soil char lab parent material
PLOWED	L	1	0	Code for was the soil plowed(Y yes : N no)
SOILTYPE	C	36	0	Soil type (surface texture)

B-2. Horizon Data Structure and Description (HORIDATA.S&D)

Variable	Variable Type	Variable Length	Variable Dec.	HORIDATA.S&D Description
NUMBER	C	9	0	State, County (001 to 067), pedon no. (sequential within a county)
SERIESNAME	C	18	0	Current soil series name
HORIZONNUM	N	2	0	Horizon number (sequential from surface down)
UDEPTH	C	3	0	Upper depth of horizon (centimeters)
LDEPTH	C	3	0	Lower depth of horizon (centimeters)
HORDISCONT	C	1	0	Horizon lithologic discontinuity
MASTERLETT	C	3	0	Horizon master letter
HORISUFFIX	C	4	0	Horizon suffix
LATERALEXT	C	2	0	Volume percent laterally that the horizon features occupies
TOTALEXTNT	C	2	0	Total volume percent of feature in horizon
AVGTHICKNS	C	3	0	Average thickness of horizon in cm
MAXTHICKNS	C	3	0	Maximum thickness of horizon
MINTHICKNS	C	3	0	Minimum thickness of horizon in inches
DRYCLR1LOC	C	1	0	Location of dry color
DRYCLR1PER	C	2	0	Percent of the matrix occupied by color
DRYCLR1HUE	C	5	0	Munsell dry color hue
DRYCLR1VAL	C	1	0	Munsell dry color value
DRYCLR1CHR	C	1	0	Munsell dry color chroma
DRYCLR2LOC	C	1	0	Location of dry color
DRYCLR2PER	C	2	0	Percent of the matrix occupied by color
DRYCLR2HUE	C	5	0	Munsell dry color hue
DRYCLR2VAL	C	1	0	Munsell dry color value
DRYCLR2CHR	C	1	0	Munsell dry color chroma
DRYCLR3LOC	C	1	0	Location of dry color
DRYCLR3PER	C	2	0	Percent of the matrix occupied by color
DRYCLR3HUE	C	5	0	Munsell dry color hue
DRYCLR3VAL	C	1	0	Munsell dry color value
DRYCLR3CHR	C	1	0	Munsell dry color chroma
WETCLR1LOC	C	1	0	Location of moist color
WETCLR1PER	C	2	0	Percent of the matrix occupied by color
WETCLR1HUE	C	5	0	Munsell moist color hue
WETCLR1VAL	C	1	0	Munsell moist color value
WETCLR1CHR	C	1	0	Munsell moist color chroma
WETCLR2LOC	C	1	0	Location of moist color
WETCLR2PER	C	2	0	Percent of the matrix occupied by color
WETCLR2HUE	C	5	0	Munsell moist color hue
WETCLR2VAL	C	1	0	Munsell moist color value
WETCLR2CHR	C	1	0	Munsell moist color chroma
WETCLR3LOC	C	1	0	Location of moist color
WETCLR3PER	C	2	0	Percent of the matrix occupied by color
WETCLR3HUE	C	5	0	Munsell moist color hue
WETCLR3VAL	C	1	0	Munsell moist color value
WETCLR3CHR	C	1	0	Munsell moist color chroma
TXTR1CLASS	C	4	0	Textural class USDA
TXTR2CLASS	C	4	0	Textural class USDA
TXTR1MODIF	C	3	0	Texture modifier
TXTR2MODIF	C	3	0	Texture modifier

APPENDIX B (Continued)

Variable	Type	Length	Dec.	Description
	--------- Variable ---------			HORIDATA.S&D
STRUC1GRAD	C	1	0	Grade of structure unit
STRUC1SIZE	C	2	0	Size of structure unit
STRUC1SHAP	C	3	0	Shape of structure unit
STRUC2GRAD	C	1	0	Grade of structure unit
STRUC2SIZE	C	2	0	Size of structure unit
STRUC2SHAP	C	3	0	Shape of structure unit
STRUC3GRAD	C	1	0	Grade of structure unit
STRUC3SIZE	C	2	0	Size of structure unit
STRUC3SHAP	C	3	0	Shape of structure unit
CONSISTDRY	C	3	0	Dry consistence
CONSISTMOS	C	3	0	Moist consistence
CONSISTOTH	C	3	0	Other consistence
STICKINESS	C	2	0	Stickiness, wet consistence
PLASTICITY	C	2	0	Plasticity, wet consistence
CEMENTATIN	C	1	0	Cementation agent
RUPTURERES	C	2	0	Rupture resistance
MICROPENT	C	2	0	Penetrometer resistance
MOTT1ABUND	C	2	0	Percent of matrix mottle occupies or abundance class
MOTT1SIZE	C	2	0	Size of mottle
MOTT1CONTR	C	1	0	Contrast of mottle
MT1HUE	C	5	0	Munsell color hue of mottle
MT1VAL	C	1	0	Munsell color value of mottle
MT1CHR	C	1	0	Munsell color chroma of mottle
MOTT2ABUND	C	2	0	Percent of matrix mottle occupies or abundance class
MOTT2SIZE	C	2	0	Size of mottle
MOTT2CONTR	C	1	0	Contrast of mottle
MT2HUE	C	5	0	Munsell color hue of mottle
MT2VAL	C	1	0	Munsell color value of mottle
MT2CHR	C	1	0	Munsell color chroma of mottle
MOTT3ABUND	C	2	0	Percent of matrix mottle occupies or abundance class
MOTT3SIZE	C	2	0	Size of mottle
MOTT3CONTR	C	1	0	Contrast of mottle
MT3HUE	C	5	0	Munsell color hue of mottle
MT3VAL	C	1	0	Munsell color value of mottle
MT3CHR	C	1	0	Munsell color chroma of mottle
SURFEA1KND	C	1	0	Kind of coat or surface feature code
SURFEA1AMT	C	2	0	Percent of the surface covered by coat or abundance class
SURFEA1CN	C	1	0	Continuity of coat
SURFEA1DIS	C	1	0	Distinctness of coat
SURFEA1LOC	C	1	0	Location of coat
SURFEA1HUE	C	5	0	Munsell color hue of coat
SURFEA1VAL	C	1	0	Munsell color value of coat
SURFEA1CHR	C	1	0	Munsell color chroma of coat
SURFEA2KND	C	1	0	Kind of coat or surface feature code
SURFEA2AMT	C	2	0	Percent of the surface covered by coat or abundance class
SURFEA2CN	C	1	0	Continuity of coat
SURFEA2DIS	C	1	0	Distinctness of coat
SURFEA2LOC	C	1	0	Location of coat
SURFEA2HUE	C	5	0	Munsell color hue of coat
SURFEA2VAL	C	1	0	Munsell color value of coat
SURFEA2CHR	C	1	0	Munsell color chroma of coat

APPENDIX B (Continued)

Variable	Type	Length	Dec.	Description
	--- Variable ---			HORIDATA.S&D
SURFEA3KND	C	1	0	Kind of coat or surface feature code
SURFEA3AMT	C	2	0	Percent of the surface covered by coat or abundance class
SURFEA3CN	C	1	0	Continuity of coat
SURFEA3DIS	C	1	0	Distinctness of coat
SURFEA3LOC	C	1	0	Location of coat
SURFEA3HUE	C	5	0	Munsell color hue of coat
SURFEA3VAL	C	1	0	Munsell color value of coat
SURFEA3CHR	C	1	0	Munsell color chroma of coat
BOUNDRYTOP	C	1	0	Boundary topography
BOUNDIST	C	1	0	Boundary distinctness
EFFERVCLAS	C	1	0	Effervescence class
EFFERVAGNT	C	1	0	Effervescence agent
EFFERVEXTN	C	1	0	Effervescence extension
FLDPRP1KND	C	2	0	Kind of field measured property
FLDPRP1AMT	C	3	0	Value or amount of field measured property
FLDPRP2KND	C	2	0	Kind of field measured property
FLDPRP2AMT	C	3	0	Value or amount of field measured property
FLDPRP3KND	C	2	0	Kind of field measured property
FLDPRP3AMT	C	3	0	Value or amount of field measured property
FLDPRP4KND	C	2	0	Kind of field measured property
FLDPRP4AMT	C	3	0	Value or amount of field measured property
FLDPRP5KND	C	2	0	Kind of field measured property
FLDPRP5AMT	C	3	0	Value or amount of field measured property
FLDPRP6KND	C	2	0	Kind of field measured property
FLDPRP6AMT	C	3	0	Value or amount of field measured property
SOILWATER	C	1	0	Wetness class
HYDRALCOND	C	1	0	Hydraulic conductivity class for horizon
ROOTS1QUAN	C	2	0	Number of roots per unit area (see pores for unit area) or class
ROOTS1SIZE	C	2	0	Size of roots
ROOTS1LOC	C	1	0	Location of roots
ROOTS2QUAN	C	2	0	Number of roots per unit area (see pores for unit area) or class
ROOTS2SIZE	C	2	0	Size of roots
ROOTS2LOC	C	1	0	Location of roots
ROOTS3QUAN	C	2	0	Number of roots per unit area (see pores for unit area) or class
ROOTS3SIZE	C	2	0	Size of roots
ROOTS3LOC	C	1	0	Location of roots
PORES1SHAP	C	2	0	Shape of soil pores
PORES1QUAN	C	2	0	Number of pores in a unit area (1 sq. cm for fine or very fine and 10 sq. cm for coarser pores) or class
PORES1SIZE	C	2	0	Size of pores
PORES1CONT	C	2	0	Continuity of pores
PORES2SHAP	C	2	0	Shape of soil pores
PORES2QUAN	C	2	0	Number of pores in a unit area (1 sq. cm for fine or very fine and 10 sq. cm for coarser pores) or class
PORES2SIZE	C	2	0	Size of pores
PORES2CONT	C	2	0	Continuity of pores
PORES3SHAP	C	2	0	Shape of soil pores
PORES3QUAN	C	2	0	Number of pores in a unit area (1 sq. cm for fine or very fine and 10 sq. cm for coarser pores) or class
PORES3SIZE	C	2	0	Size of pores
PORES3CONT	C	2	0	Continuity of pores

APPENDIX B (Continued)

Variable	Type	Length	Dec.	Description
	--- Variable ---			HORIDATA.S&D
CONCEN1KND	C	2	0	Kind of soil body code
CONCEN1QUA	C	2	0	Quantity of soil body in volume percent of matrix occupied or class
CONCEN1SHP	C	1	0	Shape of soil body
CONCEN1SIZ	C	2	0	Size of soil body
CONCEN2KND	C	2	0	Kind of soil body code
CONCEN2QUA	C	2	0	Quantity of soil body in volume percent of matrix occupied or class
CONCEN2SHP	C	1	0	Shape of soil body
CONCEN2SIZ	C	2	0	Size of soil body
CONCEN3KND	C	2	0	Kind of soil body code
CONCEN3QUA	C	2	0	Quantity of soil body in volume percent of matrix occupied or class
CONCEN3SHP	C	1	0	Shape of soil body
CONCEN3SIZ	C	2	0	Size of soil body
ROCK1KIND	C	2	0	Bedrock source code for rock fragment
ROCK1PERCN	C	2	0	Volume percent of rock fragments
ROCK1RND	C	1	0	Roundness code of rock fragment
ROCK1SIZE	C	1	0	Size code of rock fragment
ROCK2KIND	C	2	0	Bedrock source code for rock fragment
ROCK2PERCN	C	2	0	Volume percent of rock fragments
ROCK2RND	C	1	0	Roundness code of rock fragment
ROCK2SIZE	C	1	0	Size code of rock fragment
ROCK3KIND	C	2	0	Bedrock source code for rock fragment
ROCK3PERCN	C	2	0	Volume percent of rock fragments
ROCK3RND	C	1	0	Roundness code of rock fragment
ROCK3SIZE	C	1	0	Size code of rock fragment
ROCK4KIND	C	2	0	Bedrock source code for rock fragment
ROCK4PERCN	C	2	0	Volume percent of rock fragments
ROCK4RND	C	1	0	Roundness code of rock fragment
ROCK4SIZE	C	1	0	Size code of rock fragment
ROCK5KIND	C	2	0	Bedrock source code for rock fragment
ROCK5PERCN	C	2	0	Volume percent of rock fragments
ROCK5RND	C	1	0	Roundness code of rock fragment
ROCK5SIZE	C	1	0	Size code of rock fragment
ROCK6KIND	C	2	0	Bedrock source code for rock fragment
ROCK6PERCN	C	2	0	Volume percent of rock fragments
ROCK6RND	C	1	0	Roundness code of rock fragment
ROCK6SIZE	C	1	0	Size code of rock fragment
RFRAGTV	C	2	0	Rock fragments total (>2mm pct. by vol., est. in the field)
RFRAG1V	C	2	0	Rock fragments (>250mm [10 in.] pct. by vol., est. in the field)
RFRAG2V	C	2	0	Rock fragments (250 to 76mm [10 to 3 in.] pct. by vol., est. in the field)
RFRAG3V	C	2	0	Rock fragments (76 to 19mm [3 to 0.75 in] pct. by vol., est. in the field)
RFRAG45V	C	2	0	Rock fragments (19 to 2mm [0.75 in. to 2mm] pct. by vol., est. in the field)
NOTES	C	254	0	Horizon note, free form grammatically correct

B-3. Laboratory Structure and Description Files (LAB.S&D)

(a) Laboratory Data Structure and Description (LABDATA.S&D)

Variable	Variable Type	Variable Length	Variable Dec.	LABDATA (LAB.S&D) Description
NUMBER	C	9	0	State, County (001 to 067), pedon no. (sequential within a county)
SERIESNAME	C	18	0	Current soil series name
HORIZONNUM	N	2	0	Horizon number (sequential from surface down)
UDEPTH	N	3	0	Upper depth of horizon (centimeters)
LDEPTH	N	3	0	Lower depth of horizon (centimeters)
HORDISCONT	C	1	0	Horizon lithologic discontinunity
MASTERLETT	C	3	0	Horizon master letter
HORISUFFIX	C	4	0	Horizon suffix
RF1WTP	N	4	1	Rock fragments (>250mm [10 in.] wt. pct.)
RF2WTP	N	4	1	Rock fragments (250 to 76mm [10 to 3 in.] wt. pct.)
RF3WTP	N	4	1	Rock fragments (76 to 19mm [3.0 to 0.75 in.] wt. pct.)
RF4WTP	N	4	1	Rock fragments (19mm to 4.7mm [0.75 in. to 4.7mm] wt. pct.)
RF5WTP	N	4	1	Rock fragments (4.7 mm to 2.0 mm, wt. pt.)
RFTWTP	N	5	1	Rock fragments total wt. pct. of <2mm + >2mm material
LT2MMWTP	N	5	1	Less than 2mm wt. pct. of total soil material (<2mm + >2mm)
VCSAND	N	4	1	Very coarse sand (2.0 to 1.0 mm frac., wt. pct. of < 2.0 mm mat.)
CSAND	N	4	1	Coarse sand (1.0 to 0.5 mm frac., wt. pct. of < 2.0 mm mat.)
MSAND	N	4	1	Medium sand (0.5 to 0.25 mm frac., wt. pct. of < 2.0 mm mat.)
FSAND	N	4	1	Fine sand (0.25 to 0.10 mm frac., wt. pct. of < 2.0 mm mat.)
VFSAND	N	4	1	Very fine sand (0.1 to 0.05 mm frac., wt. pct. of < 2.0 mm mat.)
VFSAND1	N	4	1	Very fine sand (0.10 to 0.07 mm frac., wt. pct. of < 2 mm mat.)
VFSAND2	N	4	1	Very fine sand (0.07 to 0.05 mm frac., wt. pct. of < 2.0 mm mat.)
TSAND	N	5	1	Total sand (2.0 to 0.5 mm frac., wt. pct. of < 2.0 mm mat.)
TSILT	N	5	1	Total silt (0.05 to 0.002 mm frac., wt. pct. of < 2.0 mm mat.)
TCLAY	N	5	1	Total clay (< 0.002 mm frac., wt. pct. of < 2.0 mm mat.)
CSILT	N	4	1	Coarse silt (0.05 to 0.02 mm frac., wt. pct. of < 2.0 mm mat.)
CMSILT	N	4	1	Coarse+Medium silt (0.05 to 0.005 mm frac., wt. pct. of < 2.0 mm mat.)
MSILT	N	4	1	Medium silt (0.02 to 0.005 frac., wt. pct. of < 2.0 mm mat.)
MFSILT	N	4	1	Medium+Fine silt (0.02 to 0.002 frac., wt. pct. of < 2.0 mm mat.)
FSILT	N	4	1	Fine silt (0.005 to 0.002 mm frac., wt. pct. of < 2.0 mm mat.)
TCLASSL	C	4	0	Textural class (determined in the laboratory)
TCLASSF	C	4	0	Textural class (estimated in the field)
BDMCLWRF	N	4	2	Bulk density moist clod with rock fragments (g/cc, 1/3 atm. mois.)
BDMLT2MM	N	4	2	Bulk density moist < 2mm material (g/cc, 1/3 atm. moisture)
BDMLT2UC	N	4	2	Bulk density moist < 2mm material (core uncorrected for rock fragments; g/cc 1/3 atmos)
BDDLT2MM	N	4	2	Bulk density dry < 2mm material(g/cc, oven dry)
BDGT2MM	N	4	2	Bulk density > 2mm material (rock fragments, g/cc, oven dry)
BDTSOIL	N	4	2	Bulk density total soil (g/cc ,<2mm + >2mm mat., 1/3 atm. mois.)
BDMETH	C	1	0	Bulk density method (C = clod method, R = core method)
RFTVP	N	5	1	Rock fragments total vol. pct. (calculated from weight & BD data)
PORETSOIL	N	2	0	Porosity total soil (rock fragments + fine earth) volume percent
PORELT2MM	N	2	0	Porosity less < 2mm basis (fine earth only, rock fragments not incl.) vol. pct.
COLELT2MM	N	5	3	Coefficient of linear extensibility of less than 2mm material

APPENDIX B (Continued)

	--------- Variable ---------			LABDATA (LAB.S&D)
Variable	Type	Length	Dec.	Description
M03ACLWTP	N	5	1	Moisture content 1/3 atm. clod with rock fragments, wt. pct.
M03ALT2WTP	N	4	1	Moisture content 1/3 atm. < 2mm wt. pct.
M03ALT2UC	N	5	1	Moisture content 1/3 atm. < 2mm wt. pct. (core uncorrected for rock fragments)
M15ALT2WTP	N	4	1	Moisture content 15 atm. < 2mm wt. pct.
M3LT2BUWTP	N	4	1	Moisture content 1/3 atm. < 2mm bulk sample (not from clod or core) wt. pct.
AWLT2MMWTP	N	5	1	Available water < 2mm wt. pct.
AWLT2MMVP	N	5	3	Available water < 2mm volume basis (cm/cm)
AWTSOILWTP	N	5	1	Available water total soil (rock fragments+< 2mm, wt. pct.)
AWTSOILVP	N	5	3	Avail. water total soil (rock fragments+< 2mm, vol. basis cm/cm)
PHWL	N	3	1	pH (1:1 water, lab)
PHWF	N	3	1	pH (1:1 water, field)
PHKCLL	N	3	1	pH (1:1 KCl, lab)
PHKCLF	N	3	1	pH (1:1 KCl, field)
PHCACL2L	N	3	1	pH (1:1 CaCl2, lab)
PHCACL2F	N	3	1	pH (1:1 CaCl2, field)
OCWTP	N	5	2	Organic carbon weigh percent(< 2 mm material)
OCMETH	C	1	0	Organic carbon method (W = Walkly-Black; C = combusion)
TN	N	5	2	Total nitrogen (Kjeldal method)
CN	N	6	2	Carbon/nitrogen ratio
CACO3EQ	N	5	1	Calcium carbonate equivalent (percent < 2 mm material)
TSULFWTP	N	5	3	Total sulfur weight percent (< 2 mm material)
CA	N	4	1	Calcium exchangeable (meq/100g)
MG	N	4	1	Magnesium exchangeable (meq/100g)
NA	N	5	2	Sodium exchangeable (meq/100g)
K	N	5	2	Potassium exchangeable (meq/100g)
TB	N	5	1	Total bases exchangeable (meq/100g)
CAMG	N	5	1	Calcium/Magnesium Ratio
ALKCL	N	4	1	Aluminum exchangeable with 1N KCL (meq/100g)
EXACID	N	5	1	Extractable acidity (meq/100g)
CECSUM	N	5	1	Cation exchange capacity sum of cation method(meq/100g)
CECNH4	N	5	1	Cation exchange capacity ammonium acetate method(meq/100g)
BSSUM	N	5	1	Base saturation sum of cations method(percent)
BSNH4	N	5	1	Base saturation ammonium acetate method(percent)
ACIDSOLK	N	6	1	Acid soluble potassium (pounds/acre K; 1.0 N HNO3 method)
FE2O3	N	4	1	Iron oxides (percent < 2 mm material)
ALCBD	N	5	2	Aluminum extractable with CBD (percent)
MNCBD	N	5	2	Manganese extractable with CBD (percent)
KAOL	C	2	0	Kaolinite (percent < 2 um clay)
ILL	C	2	0	Illite (percent < 2 um clay)
VERM	C	2	0	Vermiculite (percent < 2 um clay)
MONT	C	2	0	Montmorillonite (percent < 2 um clay)
CHLOR	C	2	0	Chlorite (percent < 2 um clay)
INTER	C	2	0	Intergrade (percent < 2 um clay)
QUARTZ	C	2	0	Quartz (percent < 2 um clay)

(b) Laboratory Input Data Structure and Description (LABINPUT.S&D)

Variable	Variable Type	Variable Length	Variable Dec.	LABINPUT (LAB.S&D) Description
RF1VP	N	2	0	Rock fragments (>250mm [10 in.] vol. pct. est. in the field)
RF2VP	N	2	0	Rock fragments (250mm to 76mm [10 to 3 in.] vol. pct. est. in the field)
RF3VP	N	2	0	Rock fragments (76 to 19mm [3.0 to 0.75 in.] vol. pct. est. in the field)
RF3WT	N	4	0	Rock fragments (76 to 19mm [3.0 to 0.75 in.] wt. in g, air dried)
RF4WT	N	4	0	Rock fragments (19 to 4.7mm [0.75 in. to 4.7mm] wt. in g, air dry)
RF5WT	N	4	0	Rock fragments (4.7mm to 2.0mm wt. in g, air dry)
LT2MMWT	N	4	0	Less than 2mm material (< 2.0mm wt. in g, air dry)
PSLABNUM	C	3	0	PS (Particle size) lab no. for analysis container (fleaker and bottle)
PSFLKWT	N	6	2	PS fleaker weight (oven dry)
PSFLKPSOWT	N	6	2	PS fleaker plus soil wt. (oven dry after H2O2 treatment and candling)
PSBWT20UM	N	6	3	PS bottle weight for 20 um pipette fraction (oven dry)
PSBWT5UM	N	6	3	PS bottle weight for 5 um pipette fraction (oven dry)
PSBWT2UM	N	6	3	PS bottle weight for 2 um pipette fraction (oven dry)
PSBP20UMWT	N	6	3	PS bottle plus 20 um pipette fraction wt. (oven dry), incl. all <20 um mater.
PSBP5UMWT	N	6	3	PS bottle plus 5 um pipette fraction wt. (oven dry), incl. all < 5 um material
PSBP2UMWT	N	6	3	PS bottle plus 2 um pipette fraction wt. (oven dry), incl. all < 2 um material
PSBLANKWT	N	5	3	PS Na hexametaphosphate blank wt. (25ml pipette fraction of 1000 ml which had 10 ml of conc. Na hex. added)
PSLABNUM2	C	3	0	PS (Particle size) lab number for analysis container (beaker)
VCSANDWT	N	5	2	Very coarse sand weight (2.0 to 1.0mm fraction) (oven dry)
CSANDWT	N	5	2	Coarse sand weight (1.0 to 0.5mm fraction) (oven dry)
MSANDWT	N	5	2	Medium sand weight (0.5 to 0.25mm fraction) (oven dry)
FSANDWT	N	5	2	Fine sand weight (0.25 to 0.10mm fraction) (oven dry)
VFSAND1WT	N	5	2	Very fine sand 1 weight (0.10 to 0.074mm) (oven dry)
VFSAND2WT	N	5	2	Very fine sand 2 weight (0.074 to 0.050mm) (oven dry)
TCLASSF	C	4	0	Textural classification estimated in the field
CLLETTERa	L	1	0	Clod identification letter (a,b,c etc.)
CLWTMAIRa	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in air
CLWTMWATa	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in water
CLWTODAIRa	N	6	2	Clod wt. oven dry moisture content weighed in air
CLWTODWATa	N	6	2	Clod wt. oven dry moisture content weighed in water
CLRFWTAIRa	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in air
CLRFWTWATa	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in water
CLLETTERb	L	1	0	Clod identification letter (a,b,c etc.)
CLWTMAIRb	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in air
CLWTMWATb	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in water
CLWTODAIRb	N	6	2	Clod wt. oven dry moisture content weighed in air
CLWTODWATb	N	6	2	Clod wt. oven dry moisture content weighed in water
CLRFWTAIRb	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in air
CLRFWTWATb	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in water
CLLETTERc	L	1	0	Clod identification letter (a,b,c etc.)
CLWTMAIRc	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in air
CLWTMWATc	N	6	2	Clod wt. moist (0.33 atm. moisture content) weighed in water
CLWTODAIRc	N	6	2	Clod wt. oven dry moisture content weighed in air
CLWTODWATc	N	6	2	Clod wt. oven dry moisture content weighed in water
CLRFWTAIRc	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in air
CLRFWTWATc	N	6	2	Clod rock fragment wt. oven dry moisture content weighed in water
BDMETH	C	1	0	Bulk density method (C = clod method, R = core method)

APPENDIX B (Continued)

Variable	Variable Type	Length	Dec.	LABINPUT (LAB.S&D) Description
CAN15NUM	C	2	0	Can number for 15 atm. moisture content deter. of < 2mm material
CAN15WT	N	6	3	Can wt. for 15 atm. moisture content deter. of < 2mm material
CAN15AMWT	N	6	3	Can plus soil wt. of 15 atm. moisture content < 2mm material
CAN15AODWT	N	6	3	Can plus soil wt. of 15 atm. oven dry moisture content < 2mm mat.
PHWL	N	3	1	pH (water, lab)
PHWF	N	3	1	pH (water, field)
PHKCLL	N	3	1	pH (KCl, lab)
PHKCLF	N	3	1	pH (KCl, field)
PHCACL2L	N	3	1	pH (CaCl2, lab)
PHCACL2F	N	3	1	pH (CaCl2, field)
OCMETH	C	1	0	Organic carbon method (W = Walkly-Black; C = combusion)
OCBLANKWT	N	5	3	Organic carbon blank weight (procedure without soil;grams)
OCBWT	N	8	4	Organic carbon bottle weight
OCBPCO2WT	N	8	4	Organic carbon bottle plus CO2 weight
OCSOILWT	N	5	3	Organic carbon soil sample weight
MCCNUM	C	2	0	Moisture correction can number
MCCWT	N	6	3	Moisture correction can weight
MCCPADSOWT	N	6	3	Moisture correction can plus air dry soil weight
MCCPODSOWT	N	6	3	Moisture correction can plus oven dry soil weight
MC	N	5	3	Moisture correction factor (factor to convert from air dry to oven dry weight basis)
CACECPPM	N	4	1	Exchangeable calcium (parts per million; 0,2,5,8,10 ppm standards)
CACECDF	N	3	0	Exchangeable calcium Dilution Factor (e.g. 2,5,10 etc.)
MGCECPPM	N	4	2	Exchangeable magnesium (ppm; 0.0,0.4,1.0,1.6,2.0 ppm standards)
MGCECDF	N	3	0	Exchangeable magnesium Dilution Factor (e.g. 2,5,10 etc.)
NACECPPM	N	4	2	Exchangeable sodium (ppm; 0,0.4,1.0,1.6,2.0 ppm standards)
NACECDF	N	3	0	Exchangeable sodium Dilution Factor (e.g. 2,5,10 etc.)
KCECPPM	N	5	2	Exchangeable potassium (ppm; 0,2,5,8,10 ppm standards)
KCECDF	N	3	0	Exchangeable potassium Dilution Factor (e.g. 2,5,10 etc.)
CECSOILWT	N	4	2	Cation exchange capacity soil weigth (air dry, grams)
EXACIDBLML	N	5	2	Extractable acidity (ml of acid used in titration of blank)
EXACIDSOML	N	5	2	Extractable acidity (ml of acid used in titration of soil sample)
EXACIDNORM	N	5	3	Extractable acidity (normality of acid used in the titration)
EXACIDSOWT	N	4	2	Extractable acidity soil weight (air dry, grams)
ALKCLSOWT	N	4	2	Aluminum exchangeable with KCL soil weight (air dry, grams)
ALKCLPPM	N	4	1	Aluminum exchangeable with KCL (ppm; 0,2,4,6,10 ppm standards)
ALKCLDF	N	3	0	Aluminum exchangeable with KCL Dilution Factor (e.g. 2,5,10 etc.)
ALCBDPPM	N	4	1	Aluminum extractable with CBD (ppm; 0,2,4,6,10,20 standards)
ALCBDDF	N	3	0	Aluminum extractable with CBD Dilution Factor (e.g. 2,5,10 etc.)
MNCBDPPM	N	4	2	Manganese extractable with CBD (ppm; 0,0.5,1.5,3.0 standards)
MNCBDDF	N	3	0	Manganese extractable with CBD Dilution Factor (e.g. 2,5,10 etc.)
FECBDPPM	N	3	1	Iron oxides extractable with CBD (ppm; 0,1,3,6 ppm standards)
FECBDDF	N	3	0	Iron oxides extractable with CBD Dilution Factor (e.g. 2,5,10 etc.)
FECBDSOWT	N	4	2	Iron oxides extractable with CBD soil weight (air dry, grams)

SAMPLE NUMBER			DEPTH (cm)		D I S	HORIZON MAST LETT		ROCK FRAGMENTS mm (VOLUME PERCENT; WEIGHT, GRAMS)						
CNT	UNI	NUM	UP	LOW			SUFX	1VP >250	2VP 250-76	3VP 76-19	3WT 76-19	4WT 19-4.7	5WT 4.7-2	WT <2mm

SAMPLE NUMBER			PARTICLE SIZE - SILT AND CLAY									
CNT	UNI	NUM	LAB NUM	FLK WT	FLK PSOWT	BWT 20UM	BWT 5UM	BWT 2UM	BP 20UMWT	BP 5UMWT	BP 2UMWT	BLANK WT
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---
---	---	---	---	---.--	---.--	--.---	--.---	--.---	--.---	--.---	--.---	-.---

SAMPLE NUMBER			PARTICLE SIZE - SAND (mm; ACCUMULATIVE WEIGHT IN GRAMS)							
CNT	UNI	NUM	LAB NUM	2.0-1.0 VCSANDWT	1.0-0.5 CSANDWT	0.5-0.25 MSANDWT	0.25-0.10 FSANDWT	0.10-0.07 VFSAND1WT	0.07-0.05 VFSAND2WT	FIELD TEXTURE
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----
---	---	---	---	--.--	--.--	--.--	--.--	--.--	--.--	----

SAMPLE NUMBER			LET	BULK DENSITY						BDM	NUM	15 ATMOSPHERE WATER		
					CLOD			ROCK FRAGMENTS				CAN	CAN+	CAN+
CNT	UNI	NUM		WTMAIR	WTMWAT	WTODAIR	WTODWAT	RFWTAIR	RFWTWAT			WT	15AMWT	15AODWT
---	---	---	a	---.--	---.--	---.--	---.--	---.--	---.--	C	--	--.---	--.---	--.---
			b	---.--	---.--	---.--	---.--	---.--	---.--					
			c	---.--	---.--	---.--	---.--	---.--	---.--					
---	---	---	a	---.--	---.--	---.--	---.--	---.--	---.--	C	--	--.---	--.---	--.---
			b	---.--	---.--	---.--	---.--	---.--	---.--					
			c	---.--	---.--	---.--	---.--	---.--	---.--					
---	---	---	a	---.--	---.--	---.--	---.--	---.--	---.--	C	--	--.---	--.---	--.---
			b	---.--	---.--	---.--	---.--	---.--	---.--					
			c	---.--	---.--	---.--	---.--	---.--	---.--					
---	---	---	a	---.--	---.--	---.--	---.--	---.--	---.--	C	--	--.---	--.---	--.---
			b	---.--	---.--	---.--	---.--	---.--	---.--					
			c	---.--	---.--	---.--	---.--	---.--	---.--					
---	---	---	a	---.--	---.--	---.--	---.--	---.--	---.--	C	--	--.---	--.---	--.---
			b	---.--	---.--	---.--	---.--	---.--	---.--					
			c	---.--	---.--	---.--	---.--	---.--	---.--					
---	---	---	a	---.--	---.--	---.--	---.--	---.--	---.--	C	--	--.---	--.---	--.---
			b	---.--	---.--	---.--	---.--	---.--	---.--					
			c	---.--	---.--	---.--	---.--	---.--	---.--					
---	---	---	a	---.--	---.--	---.--	---.--	---.--	---.--	C	--	--.---	--.---	--.---
			b	---.--	---.--	---.--	---.--	---.--	---.--					
			c	---.--	---.--	---.--	---.--	---.--	---.--					
---	---	---	a	---.--	---.--	---.--	---.--	---.--	---.--	C	--	--.---	--.---	--.---
			b	---.--	---.--	---.--	---.--	---.--	---.--					
			c	---.--	---.--	---.--	---.--	---.--	---.--					
---	---	---	a	---.--	---.--	---.--	---.--	---.--	---.--	C	--	--.---	--.---	--.---
			b	---.--	---.--	---.--	---.--	---.--	---.--					
			c	---.--	---.--	---.--	---.--	---.--	---.--					

SAMPLE NUMBER			pH LAB			pH FIELD			KCL ALUMINUM			CBD IRON ALUMINUM AND MANGANESE							
									ALKCL	ALKCL		FECBD	FECBD		ALCBD		MNCBD	
CNT	UNI	NUM	WATER	KCL	CACL2	WATER	KCL	CACL2	SOWT	PPM	DF	SOWT	PPM	DF	PPM	DF	PPM	DF
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---
---	---	---	-.-	-.-	-.-	-.-	-.-	-.-	2.00	--.-	---	3.00	.-	---	--.-	---	.--	---

SAMPLE NUMBER			ORGANIC CARBON					MOISTURE CORRECTION				
CNT	UNI	NUM	METH	SOIL WEIGHT	BWT	BPCO2WT	BLANK WEIGHT	CAN NUM	CAN WEIGHT	CAN+ ADSOWT	CAN+ ODSOWT	CORR. FACTOR
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---
---	---	---	C	-.---	---.----	---.----	-.---	--	--.---	--.---	--.---	-.---

SAMPLE NUMBER			CATION EXCHANGE CAPACITY								EXCHANGEABLE ACIDITY			
			CEC	CA CEC		MG CEC		NA CEC		K CEC		EXACID	EXACID	EXACID	EXACID
CNT	UNI	NUM	SOILWT	PPM	DF	PPM	DF	PPM	DF	PPM	DF	SOWT	BLML	SOML	NORM
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---
---	---	---	4.00	--.-	---	-.--	---	-.--	---	--.--	---	2.00	--.--	--.--	-.---

APPENDIX D. Site, Horizon, Physical and Chemical Data Tables for Pedon 014-099

Pennsylvania State University
Soil Characterization Laboratory

S76-PA-014-099 (1-11) Linden Very Fine Sandy Loam

CLASSIFICATION: Fluventic Dystrochrept; Coarse-loamy, mixed, mesic DATE PRINTED: 09/30/92

SOIL SERIES NAME: Linden
SAMPLED SERIES NAME: Linden
SOIL SURVEY NO.: S76-PA-014-099 (1-11)
SOIL TYPE : Very Fine Sandy Loam
DESCRIPTION TYPE: Full pedon desc for lab characterization
LAB SAMPLE NO.: 9810 - 9817
PEDON TYPE:
CONTROL SECTION (cm):
DIAGNOSTIC FEATURES (depth cm):
ASSOCIATED SOILS:
COUNTY: Centre
MLRA: 147, Northern Appalachian Ridges and Valleys
TOWNSHIP: Rush
USGS 7.5' QUAD SHEET: Philipsburg
LATITUDE (D-M-S): 40-57-38-N
LONGITUDE (D-M-S): 078-09-43-W
LOCATION: 1 km E of Casanova Vill. 200 m N of Twp Rt 323 along Moshannon Creek; Centre County PA
REGIONAL LANDFORM: Ridge and valley
LOCAL LANDFORM: Flood plain
GEOMORPHIC COMPONENT:
HILLSLOPE COMPONENT:
SLOPE LENGTH (above,meters):
SLOPE LENGTH (total,meters):
SLOPE SHAPE (up-down,across): ,
POSITION ON SLOPE:
SLOPE (%): 1
ELEVATION (meters): 420
SLOPE ASPECT (degrees): 180
MICRORELIEF (amount,pattern kind): , ,
PARENT MATERIAL WEATHERING:
1. Unweathered
2. Unweathered
PARENT MATERIAL MODE OF DEPOSITION:
PARENT MATERIAL ORIGIN:
1. Alluvium
1. Red acid shale
2. Alluvium
2. Red acid sandstone
BEDROCK DIP (degrees):
BEDROCK STRIKE (degrees):
BEDROCK FRACTURE:
PARENT MATERIAL (PA system): Red fine and medium textured floodplain
FLOOD PATTERN (freq.,beg. mon.,days): , ,
PONDING PATTERN (freq.,beg. mon.,days): , ,
MOISTURE REGIME: Udic
WATER TABLE (depth cm,days,kind): 240, ,
PERMEABILITY: Moderate
DRAINAGE: Well drained
HYDRAULIC CONDUCTIVITY:
EROSION: Slight
PERCOLATION RATE (in/hr):
STONINESS: Class 0
RUNOFF: Very slow
WEATHER STATION:
PLOWED: Yes

	ANNUAL	WINTER	SUMMER
SOIL TEMPERATURE(C):	9.1	0.0	0.0
AIR TEMPERATURE(C):	0.0	0.0	0.0

PRECIPITATION(cm): 110
LAND USE: Abandoned cropland
VEGETATION: Oaks; Pines; Grass
DESCRIBERS NAMES: E. J. Ciolkosz, R. C. Cronce, E. R. Stein
DATE DESCRIBED: 04/17/76
PHOTO #:
YIELD ID#:
TRANSECT ID#:
MAP UNIT SYMBOL:
NOTE ID#:
NOTES: MS thesis site of Dick Cronce(1978) and Ed Stein(1977). The dark colors (N 2/0) in C4, C5 and C6 horizons appear to be Fe-Mn coatings on the sand grains and coarse fragments. Oaks, pines and several types of native grasses.
PA CLASSIFICATION: FLUVENTIC, , DYSTR, OCHR, EPT, COARSE-LOAMY, MIXED, MESIC,

APPENDIX D (Continued)

Pennsylvania State University
Soil Characterization Laboratory

S76-PA-014-099 (1-11) Linden Very Fine Sandy Loam PAGE 2 OF 4

CLASSIFICATION: Fluventic Dystrochrept; Coarse-loamy, mixed, mesic DATE PRINTED: 09/30/92

1 Ap1-- 0 to 10 cm; dark brown (7.5YR 3/2) matrix; very fine sandy loam; weak fine granular structure and weak fine subangular blocky structure; very friable, non sticky, slightly plastic; many roots; pH 4.5; abrupt wavy boundary

2 Ap2-- 10 to 20 cm; dark reddish brown (5YR 3/3) matrix; very fine sandy loam; weak very fine subangular blocky structure; friable, non sticky, slightly plastic; many roots; pH 4.5; abrupt smooth boundary

3 Bw1-- 20 to 41 cm; reddish brown (5YR 4/4) matrix; loam; weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; many roots; few faint clay films in root channels and/or pores; pH 4.4; clear wavy boundary; Dark reddish brown (5YR 3/4) ped faces.

4 Bw2-- 41 to 56 cm; reddish brown (5YR 4/4) matrix; loam; weak coarse prismatic structure parting to weak fine and medium subangular blocky structure; friable, slightly sticky, slightly plastic; common roots; faint clay films on faces of peds; pH 4.5; clear wavy boundary; Films are on prism faces; dark reddish brown (5YR 3/3) ped faces.

5 BC-- 56 to 74 cm; dark brown (7.5YR 4/4) matrix; loam; weak coarse prismatic structure parting to weak medium subangular blocky structure; very friable, slightly sticky, slightly plastic; common roots; common faint clay films on faces of peds; pH 4.5; gradual wavy boundary; Films are on prism faces.

6 C1-- 74 to 114 cm; dark brown (7.5YR 3/2) matrix; very fine sandy loam; structureless massive; very friable, slightly sticky, slightly plastic; common roots; pH 4.4; clear wavy boundary

7 C2--114 to 140 cm; dark yellowish brown (10YR 3/4) matrix; loamy sand; structureless massive; very friable, non sticky, non plastic; few roots; pH 4.4; abrupt wavy boundary

8 C3--140 to 150 cm; dark yellowish brown (10YR 3/4) matrix, black (N 2/0) matrix; gravelly loamy sand; with many medium and coarse prominent yellowish brown (10YR 5/6) mottles; structureless single grain; loose, non sticky, non plastic; few roots; pH 4.4; 50% gray & brown acid sandstone rock fragments, 40% gravel 2 mm-1.9 cm, 10% gravel 1.9-7.6 cm; abrupt wavy boundary; black (N 2/0) coatings on gravel.

9 C4--150 to 160 cm; black (N 2/0) matrix; very gravelly sand; structureless single grain; firm, weakly cemented, non sticky, non plastic; pH 4.4; 50% gray & brown acid sandstone rock fragments, 40% gravel 2 mm-1.9 cm, 10% gravel 1.9-7.6 cm; abrupt wavy boundary

10 C5--160 to 190 cm; dark yellowish brown (10YR 4/4) matrix, black (N 2/0) matrix, strong brown (7.5YR 5/8) matrix; very gravelly sand; structureless single grain; loose, non sticky, non plastic; pH 4.4; 65% gray & brown acid sandstone rock fragments, 45% gravel 2 mm-1.9 cm, 15% gravel 1.9-7.6 cm, 5% flat cobbles 7.6-25 cm; abrupt wavy boundary; Also black (N 2/0) coatings on coarse gravel, strong brown (7.5YR 5/8) and dark reddish brown (5YR 3/4) coating on medium gravel

11 C6--190 to 282 cm; strong brown (7.5YR 5/6) matrix, black (N 2/0) matrix, red (2.5YR 5/6) matrix; very gravelly coarse sand; structureless single grain; loose, non sticky, non plastic; pH 4.4; 75% gray & brown acid sandstone rock fragments, 30% gravel 2 mm-1.9 cm, 15% gravel 1.9-7.6 cm, 25% flat cobbles 7.6-25 cm, 5% flat stones 25-60 cm

APPENDIX D (Continued)

Pennsylvania State University
Soil Characterization Laboratory

S76-PA-014-099 (1-11) Linden Very Fine Sandy Loam

CLASSIFICATION: Fluventic Dystrochrept; Coarse-loamy, mixed, mesic DATE PRINTED: 09/30/92

ROCK FRAGMENT DISTRIBUTION (MM) (PCT)

NO	DEPTH (cm)	HORIZON	> 250	250-76	76-19	19-4.7	4.7-2.0	TOTAL WT	TOTAL VOL	TEXTURAL CLASS LAB	TEXTURAL CLASS FIELD
1	0- 10	Ap1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	VFSL	VFSL
2	10- 20	Ap2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	VFSL	VFSL
3	20- 41	Bw1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	SIL	L
4	41- 56	Bw2	0.0	0.0	1.4	0.0	0.0	1.4	1.0	L	L
5	56- 74	BC	0.0	0.0	1.1	0.0	0.0	1.1	1.1	L	L
6	74-114	C1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	FSL	VFSL
7	114-140	C2	0.0	0.0	0.0	2.6	4.8	7.4	6.2	LS	LS
8	140-150	C3	0.0	19.1	4.6	22.7	9.9	56.3	0.0	COS	LS
9	150-160	C4	0.0	0.0	25.8	39.0	8.8	73.6	0.0	COS	S
10	160-190	C5	0.0	3.7	29.8	33.3	12.5	79.3	0.0	COS	S
11	190-282	C6	0.0	5.5	32.1	22.6	18.9	79.1	0.0	COS	COS

PARTICLE SIZE DISTRIBUTION (MM) (PCT OF < 2 MM MATERIAL)

	SAND							SILT							
	V COARSE 2.0-1.0	COARSE 1.0-0.5	MEDIUM 0.5-0.25	FINE 0.25-0.10	V FINE 0.10-0.05	V FINE 0.05-0.07	V FINE 0.07-0.05	CO 0.05-0.02	MED 0.02-0.005	FINE 0.005-0.002	C+M 0.05-0.002	M+F 0.02-0.05	TOTAL SAND 2.0-0.05	TOTAL SILT 0.05-0.002	TOTAL CLAY <0.002
1	0.3	0.7	5.6	29.8	21.2	12.7	8.5	22.8	4.9	2.9	27.7	7.8	57.6	30.6	11.8
2	0.6	0.8	6.4	24.7	23.1	11.2	11.9	24.9	6.0	4.2	30.9	10.2	55.6	35.1	9.3
3	0.2	0.9	4.8	9.2	19.4	11.6	7.8	32.5	17.6	1.1	50.1	18.7	34.5	51.2	14.3
4	0.8	1.0	7.1	18.9	20.9	9.9	11.0	12.3	13.0	10.2	25.3	23.2	48.7	35.5	15.8
5	0.9	0.7	7.5	22.5	17.2	9.2	8.0	16.5	12.1	3.3	28.6	15.4	48.8	31.9	19.3
6	0.9	2.2	25.8	28.7	15.4	10.0	5.4	9.0	7.0	1.5	16.0	8.5	73.0	17.5	9.5
7	5.3	10.0	40.1	21.3	6.6	4.3	2.3	7.8	2.4	0.4	10.2	2.8	83.3	10.6	6.1
8	16.4	19.8	45.0	7.7	1.6	0.9	0.7	4.4	1.8	0.1	6.2	1.9	90.5	6.3	3.2
9	20.7	24.4	38.3	4.3	1.9	1.3	0.6	3.3	1.7	2.1	5.0	3.8	89.6	7.1	3.3
10	33.3	24.6	26.3	2.1	4.4	3.7	0.7	4.5	1.3	1.7	5.8	3.0	90.7	7.5	1.8
11	36.7	24.6	27.9	1.9	1.6	1.4	0.2	2.9	1.3	1.6	4.2	2.9	92.7	5.8	1.5

	BULK DENSITY (G/CC)					MOISTURE (PCT)			AVAILABLE WATER				PORE SPACE	
	1/3 ATM MOISTURE			OVEN DRY		RETAINED AT 1/3 ATM		15 ATM	< 2 MM MATERIAL		TOTAL SOIL < 2 MM + FRAGMENTS		FINE EARTH	TOTAL SOIL
NO	ENTIRE CLOD	TOTAL SOIL <2MM+FRAGS	<2 MM IN CLOD	<2 MM IN CLOD	COLE < 2 MM	ENTIRE CLOD	<2 MM IN CLOD	<2 MM SIEVED	WEIGHT (PCT)	CM/CM OF SOIL	WEIGHT (PCT)	CM/CM OF SOIL	<2MM (PCT)	FE+RF (PCT)
1								9.9						
2	1.21	1.21	1.21	1.24	0.046	11.4	11.5	10.8	0.7	0.008	0.7	0.008	53	53
3	1.27	1.27	1.27	1.33	0.015	22.8	23.0	12.2	10.8	0.137	10.8	0.137	51	51
4	1.36	1.36	1.35	1.40	0.013	21.3	22.0	12.2	9.8	0.132	9.7	0.131	48	48
5	1.48	1.36	1.36	1.41	0.010	19.1	16.1	10.7	5.4	0.073	5.3	0.073	48	47
6	1.54	1.53	1.53	1.51	0.005	12.6	13.0	6.4	6.6	0.101	6.6	0.101	41	41
7	1.75	1.78	1.75	1.77	0.027	12.3	12.5	3.4	9.1	0.159	8.4	0.150	33	31
8								6.0						
9								4.1						
10								4.1						
11								4.5						

APPENDIX D (Continued)

Pennsylvania State University
Soil Characterization Laboratory

S76-PA-014-099 (1-11) Linden Very Fine Sandy Loam

CLASSIFICATION: Fluventic Dystrochrept; Coarse-loamy, mixed, mesic DATE PRINTED: 09/30/92

NO	DEPTH (cm)	HORI-ZON	CLAY MINERALS (PCT OF < 0.002 MM MATERIAL) KAOL	ILL	VERM	MONT	CHL	INT	QUARTZ
1	0- 10	Ap1	30	25	25	0	5	15	0
2	10- 20	Ap2	30	25	25	0	5	15	0
3	20- 41	Bw1	30	25	30	0	0	15	0
4	41- 56	Bw2	35	30	25	0	0	10	0
5	56- 74	BC	40	30	15	0	0	15	0
6	74-114	C1	40	40	15	0	0	5	0
7	114-140	C2	35	50	10	0	0	5	0
8	140-150	C3	35	50	10	0	0	5	0
9	150-160	C4	35	45	5	0	0	10	5
10	160-190	C5	35	50	5	0	0	5	5
11	190-282	C6	40	50	0	0	0	5	5

	EXTRACTABLE CATIONS (MILLIEQUIVALENTS PER 100 GRAMS OF < 2.0 MM MATERIAL)								BASE SAT			HNO3
NO	CA	MG	NA	K	TOTAL BASES	ACIDITY	CEC (SUM)	CEC (NH4)	AL	SUM (PCT)	NH4 (PCT)	CA/MG	EXTRACT-ABLE K (LB/ACRE)
1	0.0	0.3	0.07	0.12	0.5	28.3	28.8		4.2	1.7			
2	0.0	0.2	0.08	0.08	0.4	26.0	26.4		4.2	1.5			
3	0.5	1.3	0.06	0.08	1.9	23.1	25.0		3.8	7.6		0.4	
4	0.0	0.3	0.06	0.06	0.4	24.7	25.1		4.2	1.6			
5	0.0	0.2	0.06	0.05	0.3	20.8	21.1		3.1	1.4			
6	0.0	0.4	0.08	0.06	0.5	11.8	12.3		1.8	4.1			
7	0.0	0.6	0.06	0.04	0.7	11.0	11.7		1.4	6.0			
8	0.1	0.8	0.06	0.03	1.0	7.2	8.2		0.5	12.2		0.1	
9	0.0	0.4	0.06	0.06	0.5	13.3	13.8		0.5	3.6			
10	0.1	0.6	0.06	0.04	0.8	7.5	8.3		0.5	9.6		0.2	
11	0.3	0.8	0.06	0.05	1.2	6.9	8.1		0.1	14.8		0.4	

	pH (1:1 SOIL:SOLUTION)						CACO3 EQUIV-ALENT	ORGANIC MATTER			IRON OXIDES	CBD EXTRACTABLE		TOTAL SULFUR
NO	WATER		1 N KCL		0.01 M CACL2			C	N	C/N	FE2O3	AL	MN	S
	LAB	FIELD	LAB	FIELD	LAB	FIELD	(PCT)	(PCT)	(PCT)		(PCT)	(PCT)	(PCT)	(PCT)
1	4.4		3.7		4.0			3.60			6.2			
2	4.5		3.8		4.2			3.00			5.2			
3	4.7		3.8		4.3			0.90			6.5			
4	4.7		3.7		4.2			0.67			7.5			
5	4.8		3.7		4.3			0.53			6.7			
6	5.0		3.9		4.4			0.65			5.6			
7	5.0		4.0		4.5			0.70			4.2			
8	5.1		4.2		4.6			0.21			3.5			
9	5.1		4.2		4.7			0.23			4.4			
10	5.3		4.4		4.9			0.16			4.6			
11	5.2		4.6		5.1			0.18			4.4			