2
Derivative Classifier D.B. Moore
D.B. Moore, Section Manager
Authorized Derivative Classifier

WSRC-RP--90-1031

DE91 007205

GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE (U)

B.B. Looney¹, C.A. Eddy¹, M. Ramdeen¹, J. Pickett², V. Rogers^{3,1}, M.T. Scott⁴, and P.A. Shirley⁴

August 31, 1990

Authentication: B.B. Looney

Approved by: D.B. Moore
D.B. Moore, Manager
Environmental Sciences Section
Savannah River Laboratory

¹ Westinghouse Savannah River Company, Savannah River Laboratory, Environmental Sciences Section, Aiken, South Carolina, 29808

² Westinghouse Savannah River Company, Raw Materials Engineering and Technology, Aiken, South Carolina, 29808

³ U.S. Department of Agriculture, Soil Conservation Service, Savannah River Site, Aiken, South Carolina, 29808

⁴ Sirrine Environmental Consultants, P. O. Box 24000, Greenville, South Carolina 29616

WESTINGHOUSE SAVANNAH RIVER COMPANY
SAVANNAH RIVER SITE
Aiken South Carolina 29808

Prepared For the U.S. Department of Energy under Contract No. DE-AC09-89SR18035

MS
DISTRIBUTION OF THIS DOCUMENT IS UNLIMITED

MASTER

GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE

Table of Contents

Table of Contents.....	iii
List of Tables	v
List of Figures	vii
List of Appendices	ix
1.0 Executive Summary	1
2.0 Introduction.....	3
3.0 Objectives.....	5
4.0 Background.....	7
4.1 Review of Soil Formation and Classification	7
5.0 Methods.....	17
5.1 Study Design.....	17
5.2 Sample Collection	18
5.2.1 Split Spoon Samples.....	19
5.2.2 Grab Samples.....	20
5.2.3 Drilling Equipment Decontamination.....	20
5.3 Sample Analysis.....	21
5.4 Statistical Methods	22
6.0 Results	49
6.1 Current Study.....	49
6.1.1 Metals.....	49
6.1.2 Other Inorganic Parameters	53
6.1.3 Organic Compounds	54
6.1.4 Radiological Parameters	55
6.1.5 Agricultural Parameters.....	55
6.1.6 Mineralogical Analysis.....	56
6.1.7 Carbon Steel/Stainless Steel Comparison Data	56
6.1.8 Laboratory Comparison Data	56
6.2 Past Studies at SRS	56
6.3 Regional, National, and Global Studies.....	57
7.0 Discussion	103
7.1 Summary of Data.....	103
7.1.1 Metals, Radionuclides and Bulk Geochemistry.....	103
7.1.2 Organics	103
7.1.3 Mineralogy	104
7.2 Sampling Method and Laboratory Comparison Studies	105
7.2.1 Carbon Steel And Stainless Steel Comparison.....	105
7.2.2 Laboratory Comparison	106
8.0 References	113

GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE

List of Tables

Table 4.1	Summary of Taxonomic Terms Applicable to Soils.....	11
Table 5.1.	SRS Soil Study Taxonomic Name for Soil Series Found on SRS.....	25
Table 5.2	General Soil Horizon Descriptions.....	27
Table 5.3.	Soil Boring Coordinates.....	33
Table 5.4	Analytical Methods - metaTRACE Labs.....	34
Table 5.5	Analytical Methods - Weston Labs.....	35
Table 5.6	Sample Specifications For Blanton Soil Series	36
Table 5.7	Sample Specifications For Orangeburg Soil Series	37
Table 5.8	Sample Specifications For Fuquay Soil Series	38
Table 5.9	Sample Specifications For Vaucluse Soil Series.....	39
Table 5.10	Sample Specifications For Lakeland Soil Series.....	40
Table 5.11	Sample Specifications For Udorthent Soil Series	41
Table 6.1.	Summary Statistics for Metals Measured (all samples)	60
Table 6.2.	Summary Statistics for Aluminum (by series and layer).....	61
Table 6.3.	Summary Statistics for Arsenic (by series and layer)	62
Table 6.4.	Summary Statistics for Barium (by series and layer)	63
Table 6.5.	Summary Statistics for Cadmium (by series and layer).....	64
Table 6.6.	Summary Statistics for Chromium (by series and layer)	65
Table 6.7.	Summary Statistics for Copper (by series and layer)	66
Table 6.8.	Summary Statistics for Iron (by series and layer)	67
Table 6.9.	Summary Statistics for Lead (by series and layer)	68
Table 6.10.	Summary Statistics for Magnesium (by series and layer)	69
Table 6.11.	Summary Statistics for Manganese (by series and layer).....	70
Table 6.12.	Summary Statistics for Mercury (by series and layer).....	71
Table 6.13.	Summary Statistics for Nickel (by series and layer)	72
Table 6.14.	Summary Statistics for Potassium (by series and layer).....	73
Table 6.15.	Summary Statistics for Selenium (by series and layer)	74
Table 6.16.	Summary Statistics for Silver (by series and layer).....	75
Table 6.17.	Summary Statistics for Sodium (by series and layer).....	76
Table 6.18.	Summary Statistics for Zinc (by series and layer).....	77
Table 6.19.	Summary Statistics for Other Inorganic Parameters Measured	78
Table 6.20.	Summary Statistics for Chloride (by series and layer).....	79
Table 6.21.	Summary Statistics for Nitrate (by series and layer)	80
Table 6.22.	Summary Statistics for Sulfate (by series and layer).....	81
Table 6.23.	Summary Statistics for Bulk Organic Constituents (all samples).....	82
Table 6.24.	Summary Statistics for Total Organic Carbon (by series and layer).....	83
Table 6.25.	SRS Soil Study Appendix VIII Organic Compounds Detected.....	84
Table 6.26.	Summary Statistics for Radionuclides (all samples)	85
Table 6.27.	Summary Statistics for Gross Alpha (by series and layer)	86
Table 6.28.	Summary Statistics for Nonvolatile Beta (by series and layer)	87
Table 6.29.	Summary Statistics for Uranium (by series and layer).....	88
Table 6.30.	SRS Soil Study X-Ray Diffraction Analyses Of Whole Soil Samples.....	89
Table 6.31.	SRS Soil Study X-Ray Diffraction Analyses Of Clay Mineral Fraction...	90
Table 6.32	Summary of Carbon Steel vs Stainless Steel Sampler Results.....	91
Table 6.33	Summary of Interlaboratory Comparison Results.....	92
Table 6.34.	Summary of Control/Background Data for Various Constituents from Sewage Sludge Application Test Sites	95
Table 6.35	Radionuclide Data for SRS Soils.....	96
Table 6.36	Regional, National, and Global Soil Concentrations.....	97

GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE

List of Figures

Figure 4.1	Recent Changes in Master Horizon Designations	14
Figure 4.2	Hypothetical Soil Profile Showing The Principal Horizons And Potential Occurrence On The Savannah River Site	15
Figure 5.1	Sample Locations for Grouping One (Blanton) Soils	42
Figure 5.2	Sample Locations for Grouping Two (Orangeburg) Soils	43
Figure 5.3	Sample Locations for Grouping Three (Fuquay) Soils	44
Figure 5.4	Sample Locations for Grouping Four (Vaucluse) Soils	45
Figure 5.5	Sample Locations for Grouping Five (Lakeland) Soils	46
Figure 5.6	Sample Locations for Grouping Six (Udorthent) Soils	47
Figure 6.1	Frequency of Occurrence of Organic Compounds in Appendix VIII Analyses	59
Figure 7.1	X-ray diffraction pattern of typical sample of chloritized-vermiculite showing collapse to 10Å structure on heating to 350° C	107
Figure 7.2	Depth profile showing distribution of minerals in the clay fraction of the Blanton Soil Series from four horizons at locations BSS 33 and BSS 45	108
Figure 7.3	Depth profile showing the distribution of minerals in the clay fraction of the Fuquay Soil Series from four horizons at locations BSS 42 and BSS 44	109
Figure 7.4	Depth profile showing the distribution of minerals in the clay fraction of the Lakeland Soil Series from three horizons at locations BSS 41 and BSS 51	110
Figure 7.5	Depth profile showing the distribution of minerals in the clay fraction of the Orangeburg Soil Series from four horizons at locations BSS 34 and BSS 46	111

DISCLAIMER

This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof.

GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE

List of Appendices

Appendix A	Background Soil Study Quality Control and Sampling and Analysis Plan
Appendix B.1	Background Soil Sample Locations
Appendix B.2	ASTM Classification of Background Soil Samples
Appendix B.3	Modified Wentworth Classification of Background Soil Samples
Appendix C.1	Metal Data Summary
Appendix C.2	Other Inorganic Data Summary
Appendix C.3	Organic Data Summary
Appendix C.4	Radiological Data Summary
Appendix C.5	Particle Size Data Summary
Appendix C.6	Carbon Steel/Stainless Steel Data Summary
Appendix C.7	metaTRACE/Weston Laboratory Comparison Data Summary

Geochemical and Physical Properties of Soils and Shallow Sediments at the Savannah River Plant

1.0 Executive Summary

A program to characterize the geochemical and physical properties of the unimpacted soils and shallow sediments at the Savannah River Site (SRS) has been completed. The maximum, minimum, median, standard deviation, and mean values for metals, radionuclides, inorganic anions, organic compounds, and agricultural indicator parameters are summarized for six soil series that were identified as representative of the 29 soil series at SRS.

The soils from unimpacted areas of SRS are typical of soils found in moderately aggressive weathering environments, including the southeastern United States. The temperate climate and relatively high rainfall in the region result in leached soils that have low concentrations of metals. In general, metal concentrations increase with depth and in proportion to the clay content of the soil. The upper soil horizons are generally more highly leached, and exhibit lower concentrations, than the lower horizons and the parent material. The mineralogy of the soils is dominated by quartz and the primary clay mineral found in SRS soils is kaolinite. A similar age, climate and moisture regime governed the formation of most of the various soils at SRS. The similarity of the conditions governing soil formation minimizes the various geochemical delineations. A few notable exceptions were found (e.g., Mn in the Orangeburg soil series).

Appendix VIII organic compounds were detected in all samples. Since these constituents are not generally present in soil, this portion of the investigation was intended to assess possible laboratory artifacts. A total of six different compounds were detected in the samples, and not all of these parameters were detected in all samples. Of the six compounds detected, four are commonly occurring laboratory artifacts and two may result from usage at SRS, or may be analytical artifacts.

An additional objective of the SRS Soil Study was to determine if the composition of the split spoon sampler biased chemical analysis of the the soils. Two adjacent sample borings were collected using split spoon samplers constructed of carbon steel and stainless steel. Only two constituents, Cd and Pb, were found to be significantly different. In both cases, the absolute value of the variation was relatively small and would be unlikely to impact screening decisions based on the data.

Twenty-five duplicate samples were analyzed for a number of metals, radiological and agricultural parameters, and organics by two laboratories currently contracted with to analyze samples during waste site characterization. In all cases, the absolute values of the average differences are relatively small compared to the overall variability in the population. Nonetheless, the possibility of differences resulting from variation in analyzing laboratory should be considered if detailed statistical comparisons are made using the SRS Soil Study.

2.0 Introduction

The Savannah River Site (SRS) is a nuclear production facility operated for the U. S. Department of Energy by Westinghouse Savannah River Company. A program to characterize the geochemical and physical properties of the soils and shallow sediments at SRS has been completed. This program provides baseline data to support regulatory decision making as well as to support a large number of research programs ranging from studies of ecology to studies of innovative soil and groundwater remediation technologies. The design of this SRS Soil Study was developed to meet a wide range of objectives in a most cost effective manner. The twenty-nine different taxonomic series of soils at SRS were organized into six groupings based on the descriptive properties of each series. Several samples of one soil series from each grouping were analyzed to determine the chemical, physical and mineralogical properties for the grouping.

The resulting data will be used to investigate the qualitative and quantitative impacts of SRS operations on the environment, and will assist in regulatory decision making related to waste site remediation. The results will also be used to evaluate natural or ecological processes that are governed by soil or shallow sediment properties.

3.0 Objectives

The SRS Soil Study was designed to meet several specific objectives. These objectives were:

1) Determine the characteristics of SRS soils. Specific characteristics evaluated were trace element concentrations, major element concentrations, bulk chemical properties that may affect migration of chemicals through the soil (e.g. cation exchange capacity), indicator parameters (e.g., exchangeable base metals), physical properties (e.g., particle size distribution), and mineralogy. Specific constituents measured are listed below.

Metals

Aluminum
Arsenic
Barium
Cadmium
Chromium
Copper
Iron
Lead
Lithium
Magnesium
Manganese
Mercury
Nickel
Potassium
Selenium
Silver
Sodium
Zinc

Organics

Total Organic Carbon
Total Organic Halogens

Radiological Parameters

Gross Alpha
Gross Beta
Strontium-90
Uranium

Other Inorganic Constituents

Chloride
Cyanide
Fluoride
Nitrate
Nitrite
Phosphate
Sulfate

Agricultural Parameters

Cation Exchange Capacity (Looney et al., 1990)
Exchangeable Acidity (Looney et al., 1990)
Exchangeable Base Metals (Looney et al., 1990)
pH (Looney et al., 1990)

2) Compare the chemical data for soils collected using split spoon samplers constructed of carbon steel vs. stainless steel to determine if the composition of the split spoon sampler results in a bias in the chemical analysis of the soils.

3) Compare the chemical data for duplicate samples analyzed by the laboratories currently contracted to analyze samples during waste site characterization.

The analytical results from the SRS Soils Study were evaluated using multivariate statistical techniques to address three additional objectives that are discussed in a separate report (Looney et al., 1990). First, the raw data were analyzed to determine the statistical distribution of each constituent in order to use the appropriate methods to properly characterize censored data and to determine the most reasonable underlying distribution. Second, paradigms were developed to allow application of the baseline data to regulatory decision making. Two specific cases were addressed, (1) "is a constituent in a potential waste disposal area statistically different than background," and (2) "what is a reasonable

background level to set as a goal for waste site excavation remedial actions that are based on background values rather than health based standards?". The final objective of the SRS Soils Study was to perform a preliminary evaluation of the soil series most likely to be present at or near the sites currently identified in the Resource Conservation and Recovery Act (RCRA) Facility Investigation (RFI) program. These results along with statistically defensible screening levels are presented in Looney et al., 1990.

It is clear from the above list that both fundamental and pragmatic objectives were addressed in the SRS Soil Study. In a few cases, compromises were made to address the wide range of objectives in the most efficient and justifiable overall manner. For example, to meet regulatory objectives, standard EPA protocols for sample extraction and handling were employed. Standard EPA protocols for soil samples require dissolution by nitric acid alone which may result in incomplete dissolution of soil samples especially mineral constituents. Soils generally are composed at least partially of mineral constituents: accessory minerals such as zircon, monazite, magnetite, etc., may constitute only a minor percentage of the bulk soil but may contribute significant concentrations of trace elements to the bulk analysis. These accessory minerals are particularly resistant to acid attack and would likely constitute part of the insoluble residue. The ranges in measured concentrations of major, minor and trace elements reported in this study should be more variable than total concentrations generated by completely dissolving the soil. It should be recognized that samples prepared by other dissolution protocols may not be directly compared to the results of the SRS Soil Survey. Additionally, the number and type of samples and sample analyses were determined in such a way that each of the listed objectives was addressed in a cost effective manner. The results of the SRS Soil Study in terms of each of the listed objectives are documented in the following sections.

4.0 Background

4.1 Review of Soil Formation and Classification

While there are a wide number of possible definitions of the term soil, soil scientists and geologists define soil as (Rose et al., 1979):

"a natural body of mineral and organic constituents, differentiated into horizons, of variable depth, which differs from the material below in morphology, physical make-up, chemical properties and composition, and biological characteristics."

Thus, the unique characteristic of soil is its organization into identifiable layers that are related to the present day land surface and change with depth. The term sediment is generally used to describe unconsolidated material beneath the soil; the sediment directly beneath the soil zone is often the parent material of the soil. Five interrelated soil forming factors determine the thickness and characteristics of the various layers in a soil profile. The five factors are parent material, climate, biologic activity, topography, and time. The thickness and characteristics of the resulting soil layers in turn determine the classification of the subject soil. Each of the soil forming factors and the aspects of soil taxonomy pertinent to SRS soils are reviewed below.

The parent material is the source of the bulk raw materials that form the soil. The influence of parent material on overlying soil properties is strongest in young soils, in the deeper horizons that grade into the parent materials, and in climates where chemical weathering is slow. In well developed soils, the influence of the parent material on a soil is subordinate to other factors. Even in these soils, however, the mineralogical and trace element assemblages, as well as the rate of soil development, will be related to the chemistry and stability of the original parent material.

Climate is the most significant soil forming factor. In well developed soils, similar parent materials may form vastly different soils depending on climate. Similarly, different parent materials will form very similar soils when influenced by the same climate for sufficient time. In general, the soils in humid climates, such as SRS, tend to be leached and to possess iron rich lower horizons while soils in arid climates tend to be less leached in the surface layers. Temperature combined with the downward and upward movements of water, as influenced by precipitation and evaporation, will determine the dissolution and movement of soil components and deposition of dissolved salts. Climate is a key factor in the pH, clay minerals, calcium, iron, organic matter, and trace metal composition of soils.

Biological factors in soil formation include the type of vegetation and decomposition of plant debris carried out by soil microorganisms. The accumulation of humus is favored by humid climates (i.e., more vegetation) and cool temperatures (i.e., less decomposition). Warm climates restrict the accumulation of humus because of increased decomposition, but accelerate the action of the resulting organic acids on the lower soil layers. Different types of vegetation may have different root depths and may yield different decay products.

Topographic position and relief influence soil formation through interaction between drainage, erosion and ground water level. For example, soil horizons are most strongly differentiated in regions of moderate to high rainfall where there is free drainage and effective leaching. Such profiles develop in interstream areas at SRS. In low-lying areas, such as wetlands near streams and Carolina bays, the terrain may be saturated with water resulting in a significantly different soil profile. Under such circumstances, the profile often consists of an organic rich surface layer underlain by a pallid or mottled subsoil in which reducing conditions are present. If water stands at the surface, peat may develop. Soils on steep slopes tend to be thinner, show less distinct layer

development and have a higher content of stony material than those on gentler slopes. In some areas, erosion may truncate a profile and move material downslope.

Accumulation of parent material and differentiation into soil horizons are slow processes. Soil development is a time or rate dependent process, and generally, development of horizons progresses from development of a faint upper zone in time periods as short as decades to development of full profiles in time periods ranging from centuries to tens of thousands of years. Soils are sometimes classified as juvenile or mature by comparing their development to completely developed soil horizons under present-day surface conditions. Where erosion is active, soils will remain in a juvenile condition irrespective of time. If erosion proceeds no faster than soil formation, a mature profile will eventually result.

The soils that are formed by the five factors discussed above are characteristically organized into layers that differ from each other and the underlying parent material in properties and composition. Apart from differences in color and texture, the layers can differ in pH, organic matter, clay minerals, and inorganic chemical composition. Comparison of a given soil sample to a background soil sample is only reasonable if equivalent horizons within the soil profile are compared and the factors responsible for the formation of the two samples are similar. A typical soil profile is described below, along with the soil classification scheme that may be used to logically divide soils into groupings expected to have similar characteristics.

A soil profile is comprised of individual layers that are referred to as soil horizons and may range from a few centimeters to a meter or more in thickness. Profile development is primarily the result of vertical (upward and downward) movement of material in solution and suspension, accompanied by a complex series of chemical reactions. Water is the essential medium in which this transfer and reconstitution takes place.

Soil profiles vary within wide limits according to their genetic and geographic environment. Most well-developed profiles, however, can be divided into principal or master horizons. From the surface downward these are identified by the letters A, E, B, C, and R. The A, E, and B horizons constitute the solum, or "true soil", while the C horizon is the partly weathered parent material from which the solum has been derived by soil-forming processes, and the R horizon is the underlying rock material. A horizon of nearly pure organic matter (O) may lie above the A horizon. A hypothetical soil profile is shown diagrammatically in Figure 4.1. Master soil horizons are shown in Figure 4.2.

The entire soil sequence is not always represented. For instance, immature soils frequently lack a B horizon, or erosion may lead to truncated profiles, sometimes to the extent of exposing the C horizon. When studied in detail, each of the principal horizons may be further subdivided. These subdivisions are identified by combined letters and numbers, e.g., A, E, B₁, B₂, B₃, etc (Figure 4.1). Recognition of these subdivisions, apart from the A and E horizons, is usually unnecessary in a geochemical studies. The distribution of metals may vary markedly with major changes down the profile. It is therefore important to distinguish the master horizons and to recognize immature and truncated profiles when these are encountered (U.S.D.A., 1981).

The A and E horizons are characterized by a process of leaching known as eluviation, meaning "to wash out", with maximum eluviation taking place in the E horizon. Eluviation is accomplished by the downward percolation of water through the soil. Some constituents are removed as ions or molecules in solution in the downward-moving water; others are removed as dispersed colloidal particles. The leaching of the A horizon may be accelerated by organic acids.

Under moist conditions and free drainage, soluble constituents will be carried to the water table. Some suspended matter may follow the same path. More often, however, colloidal silicates, oxides and organic matter, as well as some dissolved constituents will be deposited in the Bt

horizon (signifying the accumulation of clay), a zone of accumulation or illuviation (meaning "to wash in"). Thus, the Bt horizon tends to be enriched in clay and oxides and, in well aerated upland soils, assumes a red or yellow-brown color.

The level at which illuviation takes place is dependent on acidity, infiltration rate, hydrologic conductivity of the soil, rainfall, and climate; in fact, all of the soil forming factors influence illuviation either directly or indirectly.

The C horizon consists of variably weathered parent material and lacks evidence of biological activity. Material comprising the C horizon on the SPS has been deposited by marine and/or fluvial activity. There is evidence that only a few million years ago a large stream, perhaps the Savannah River, cut across the site and flowed into or close to where the Salkehatchie River presently enters what is known as St. Helena Sound. The soils at the SRS have been weathered, formed, and moved many times and represent the summation of an active history of soil formation. As a rule, inorganic decomposition extends below the depth that is routinely described in the classification of soils. In most areas, the C horizon could be subdivided further into weathering zones that decrease with depth. The C horizon has little or no organic matter, no structural development, little or no evidence of illuvial clay, and often has stratified sands and clays indicating sediment deposition by varied velocities of water flow. As a rule, inorganic decomposition extends deeper than soil formation, and the C horizon can often be subdivided into zones of weathering that decrease in intensity with depth. Organic matter is at a minimum in the C horizon, which usually contains less clay.

Soils are divided into categories based on characteristics related to the factors discussed above. The prefixes and suffixes in the taxonomic names provide information about the five soil forming factors: climate, topography, parent material, time, and biological activity. At the broadest level of classification in soil taxonomy, soils are divided into ten Orders determined largely by the presence of one or more of the diagnostic horizons. The ten Orders are listed in Table 4.1, along with their diagnostic features. Diagnostic horizons are the key to separation and classification of Orders, and are potentially important in recognizing the nature of trace-metal concentrations. For example, oxisols are highly leached soils, and aldisols are less leached than ultisols. Ultisols are old mineral soils having an illuvial horizon (Bt) of silicate clays, low base saturation, and subject to rapid leaching. Entisols are young mineral soils with weak or no pedogenic horizons or an old soil that has mostly inert parent material such as quartz. The five Orders that are found at the SRS are identified in Table 4.1.

Orders are subdivided into Suborders on the basis of climate, drainage, or other distinctive features or properties. Names for Suborders are formed from a prefix denoting the "formative element" (Table 4.1) and a suffix denoting the Order. For example, an aquod is a water-saturated (aqu-) spodosol (-od). About 50 Suborders are recognized. Successively more detailed subdivisions are Great groups, Subgroups, Families, and Series. Great groups are formed by adding a prefix to denote diagnostic horizons or variants of horizons. The names of Subgroups are formed by an adjective preceding the name of the Great group to indicate its gradational position in relation to the neighboring Great groups. Family names add more adjectives to indicate properties important to plant growth. For example, a Family name for a given soil might be fine-loamy, siliceous, thermic family of aquic Kandiodults. This is a soil having 18 to 35 percent clay content, more than 90 percent silica minerals, and a mean temperature of 15° to 22° C at 50 cm below the surface. This soil is moderately well drained or water may perch in the profile at 50 to 75 cm below the surface for the duration of a few months in most years, has a CEC below 16 meq/100 g, has a clay rich (Bt) horizon, is an old well developed soil (ult), formed in a humid region, and has few remaining mineral phases. From the SRS perspective, this soil has typically a low capacity to hold complex cations within the soil.

The soil series is the most detailed and most specific part of the taxonomic system. A series must come from a particular type of parent material and must have similar horizon development. The soil surface may differ so series are further divided into soil type by adding the surface texture, for example, Orangeburg loamy sand. There are about 29 series correlated in the SRS soils report, and approximately 30 more series of such limited areal extent that they were not identified in this report. There are about 14,000 different soil series in the U.S.

Table 4.1 Summary of Taxonomic Terms Applicable to Soils
SOIL ORDERS AND SUFFIXES

SOIL ORDER AND SUFFIX TO FORM NAME OF SUBORDER	LATIN OR OTHER ROOT	DESCRIPTION
SOIL ORDERS FOUND AT SRS		
Entisols(-ent)	Recent	Mineral soils without significant profile development, with little modified parent material, and no deep wide cracks most years.
Inceptisols(-ept)	<i>L. inceptum</i> , beginning	Mineral soils, some pedogenic horizons and some weatherable minerals, moisture available to mature a crop most years, no horizon of illuvial clay, relatively low in either organic matter or base saturation, or both.
Spodosols(od)	<i>L. spodos</i> , wood ash	Mineral soils, an illuvial horizon of amorphous aluminum and organic matter, with or without amorphous iron. Only small areas on SRS are in this order.
Ultisols(ult)	<i>L. ultimus</i> , last	Mineral soils, an illuvial argillic or kandic horizon of silicate clays, low base saturation, old well developed profile.
Histosol (-ist)	<i>L. histos</i> ,	Soils with organic material comprising more than half of the upper eighty centimeters.
SOIL ORDERS NOT FOUND AT SRS		
Alfisol	Al-Fe	Soils with an argillic, kandic or natric B horizon, base saturation >35%; moist part of the time; lack calcic, gypsic, or mollic horizons.
Oxisol (-ox)	Oxide	Soils with an oxic B horizon.
Aridosol (-id)	<i>L. aridus</i> , dry	Soils with an ochric A horizon and high base saturation, may have calcic, gypsic, argillic, kandic, or natric B horizons.
Mollisol (-oll)	<i>L. mollis</i> , soft	Soils with a mollic A horizon and high base horizon.
Vertisol (-ert)	<i>L. berto</i> , change	Soils with a high content of swelling clay, forming wide cracks when dry, into which surface soil falls or is washed.

Table 4.1 (Cont.)

**Summary of Taxonomic Terms Applicable to Soils
SRS Soil Study**

PREFIXES USED IN NAMING SUBORDERS AND GREAT GROUPS PRESENT AT SRS

Aqu-	Soils that are wet for long period (Suborder)
Arg-	Soils having an illuvial horizon of silicate clay accumulation (Great group)
Dys-, Dyst-	Soils with low base saturation (Great group)
Fluv-	Recent soil material deposited by streams (Suborder)
Kan-	Soils with CEC < 16 meq/g clay and ECEC < 12 meq/g clay (Great group)
Hapl-	The simplest set of horizons (Great group)
Hum-	Soils with appreciable amounts of humus (Suborder or Great group)
Med-	A soil of midlatitudes (Great group)
Ochr-	Soils with little organic matter, light colored or both. (Suborder)
Pale-	A soil having more horizon development than normal (Great group)
Psamm-	Sandy soils to a depth of 1 meter or more (Suborder or Great group)
Quartz	Soils with more than ninety-five percent quartz (Great group)
Sapr-	Soils with highly decomposed plant fibers (Suborder)
Ud-	Soils of humid climates where the soil is moist but not wet and dry for short periods or not at all (Suborder or Great group)

OTHER MODIFIERS USED TO DESCRIBE SOILS AT SRS

aeric	Less gray and better aerated than is typical of subgroup -- used to show variation from the typical subgroup
aquic	More water in soil than is typical of the subgroup -- used to show variation from the typical subgroup
arenic	Sandy eluvial horizon (sand or loamy sand), mostly between fifty and one hundred centimeters thick
cumulic	An epipedon with a greater accumulation of humus than is typical of the humic epipedon.
fluventhic	
grossarenic	Sandy eluvial horizon (sand or loamy sand) > 1 m thick
plinthic	Presence of diagnostic amounts of plinthite, an iron-rich material that hardens irreversibly upon exposure to wet and dry conditions
typic	Characteristic typical of the specific Great group

Table 4.1 (Cont.)

**Summary of Taxonomic Terms Applicable to Classification of Soils
into Taxonomic Families for the SRS Soil Study**

PARTICLE SIZE MODIFIERS

Sandy	The texture of the fine earth is sand or loamy sand and rock fragments comprise less than 35% by volume.
Loamy	The texture of the fine earth is loamy, very fine sand or finer, the amount of clay is < 35 %; rock fragments comprise < 35%.
Coarse loamy	Fifteen percent or more of the particles are fine sand or coarser, including fragments up to 7.5 cm. in. diameter
Fine-loamy	Fifteen percent or more of the particles are fine sand or coarser, including fragments up to 7.5 cm. in. diameter; 18 through 35 percent clay in the fine earth fraction.
Coarse-silty	Fifteen percent of the particles are fine sand or coarser, including fragments up to 7.5 cm. in. diameter; <18 percent clay in the fine earth fraction.
Fine-silty	Fifteen percent of the particles are fine sand or coarser, including fragments up to 7.5 cm. in. diameter; 18 - 34 percent clay in the fine earth fraction.
Clayey	The fine earth contains $\geq$ 35 percent clay, and rock fragments are <35 percent .
Fine	A clayey particle-size class for soils having 35 through 59 percent clay in the fine earth fraction.

MINERAL CONTENT MODIFIERS

Siliceous	More than ninety percent by weight of silica minerals and other durable minerals that are resistant to weathering.
Mixed	Soils that have <40 percent of any one mineral other than quartz or feldspar
Kaolinitic	More than half kaolinite, tabular halloysite, dickite, nacrite by weight and smaller amounts of 1:1 or minor nonexpanding 2:1 layer minerals

OTHER MODIFIERS

Acid	Soil with a pH < 5.0 (in CaCl ₂) throughout the control section
Dysic	Soil with a pH < 4.5 (in CaCl ₂) in parts of organic material in the control section
Nonacid	Soil with a pH > 5.0 (in CaCl ₂) in a part of the control section
Coated	Soil in which sand grains are coated with a sufficient amount of clay to increase the moisture equivalent to two percent
Thermic	Soil with a mean annual soil temperature from 15° to 22° C at a depth of 50 cm.

SOIL SURVEY MANUAL, 1951
MAY 1962 SUPPLEMENT

SOIL SURVEY MANUAL
JUNE 1981

Figure 4.1 Recent Changes in Master Horizon Designations
(after: U.S.D.A. Agency for International Development, Department of Agronomy, Cornell University, October, 1986)

Figure 4.2 Hypothetical Soil Profile Showing The Principal Horizons And Potential Occurrence On The Savannah River Site
(Modified from U.S.D.A. National Soil Survey Manual, 1981).

5.0 Methods

Several categories of activities were integrated to meet the overall objectives of the SRS Soil Study. These activities included:

- 1) Review existing data and define archetype soil series.
- 2) Collect and analyze samples using protocol methods. Compare sampling methods and laboratories using duplicate samples.
- 3) Summarize the data for the various series, as well as for areas with disturbed, missing, or filled soil profiles.

5.1 Study Design

To meet the fundamental and pragmatic objectives on the SRS Soil Study, logical groupings of soils were developed based on taxonomic similarities. The number of analyses was determined based on a balance of statistical requirements and cost. Thus, the goal of the study design was to describe as much of the plant area as possible within a reasonable budget and time.

As shown on Table 5.1, there are twenty-nine soil series identified at SRS (Soil Conservation Service, 1989). Since testing all twenty-nine series was not feasible, some of the soil series were eliminated and the remaining series were grouped so that the data would be as representative as possible. For example, it is unlikely that a waste site would be located on wetland soils such as Fluvaquents and Pickney. Restricting the study to the upland series reduced the number of series to be tested from twenty-nine to fifteen. By using the taxonomic class for these fifteen soil series, we were able to come up with six broad soil groupings. These six groupings cover approximately 75.4 percent of the site (Table 5.1). A single representative soil series from each of the six groupings was sampled. The data were analyzed and presented for the reference series in each grouping; the characteristics of the other soil series in the various groupings are expected to be similar to the pertinent reference series. A summary of taxonomic groupings applicable to upland SRS soils is presented in Table 4.1.

Blanton sand is the predominant soil series on SRS. It covers 21 percent of the plant site. The Blanton soil series was chosen as the central soil series in grouping one as the remaining soils in grouping one had the same or similar properties of Blanton. The taxonomic name for the Blanton soil series (Table 4.1) indicates that the soil is composed almost entirely of silica or other weather resistant minerals. Also, the sandy layer is greater than one meter thick, the soil is very old and well developed with a very low base saturation. The Troup soil series, Albany soil series, Wagram soil series, and Lucy soil series were also placed into grouping one. The Albany and Troup soil series are nearly a perfect match for Blanton soil series although both the Albany and Troup have a higher water table than Blanton. The Lucy soil series was placed in this grouping because large areas of Troup are intermixed with Lucy. Also, the Lucy soil series shares most of the same characteristics except that it is arenic rather than grossarenic indicating that the sandy layer is not quite as thick. The Wagram soil series shares the same properties as Lucy soil series.

The central soil series in grouping two is the Orangeburg series. This soil type covers 3.4 percent of SRS. The taxonomic name for Orangeburg (Table 5.1) suggests that this soil consists of at least 15 percent sand and approximately 18 to 35 percent clay. Like the Blanton soil series, it is composed almost entirely of silica or other weather resistant minerals. This series is characterized by a well developed mineral soil with an illuvial horizon that is loamy and siliceous. The Orangeburg soil series has a low base saturation. The Norfolk soil series (Table 5.1) was

placed into grouping two because Norfolk and Orangeburg share the same taxonomic name. The grouping two series covers about 5 percent of the SRS.

The second most common soil type on SRS is Fuquay soil series. This series encompasses roughly 11.3 percent of the site, therefore, it was made the central series of grouping three. The taxonomic name for Fuquay (Table 5.1) indicates that it is composed of less than 35 percent clay material and is almost entirely silica or other weather resistant minerals. The sandy layer is between 20 and 40 inches deep. The Fuquay soil series contains more than 5 percent plinthite, an iron-rich material that hardens irreversibly upon wetting and drying. The series is very well formed and has a low base saturation. The other soil series that was grouped with Fuquay was Dothan. The Dothan and Fuquay soil series differ only in particle size and in the thickness of the sandy surface and subsurface horizons. The most important characteristic of both soils series is that they are the only plinthic soils found at SRS. Grouping three soils cover 19.2 percent of SRS.

The central series in grouping four is the Vacluse soil series. This soil series includes the Vacluse-Ailey complex. This series covers 6.9 percent of SRS. The taxonomic name for Vacluse (Table 5.1) indicates that the soil was very well developed with a simple set of horizons. It is at least 15 percent sand and approximately 18 to 35 percent clay. Over 90 percent of the soil is either silica minerals or other weather resistant minerals. The Ailey soil series has similar characteristics to Vacluse. The differences between Ailey and Vacluse is the thickness of the sandy surface and subsurface layers. Since Vacluse and Ailey are very often intermixed, it is very hard to find an area that is predominantly one or the other.

Lakeland sand is the only soil series at SRS that is classified as a quartzipsamment (deep sand) and therefore is the only soil series in grouping five. The taxonomic name for Lakeland (Table 5.1) indicates that the soil is composed of coated sands to depths of 2 meters or more. It is an old soil but has very weak or no pedogenic development due to the slow weathering of the quartz parent material. Lakeland covers 4.3 percent of SRS.

The sixth and final grouping is the Udorthents which include firm and friable substratum along with paved streets, buildings, etc. This grouping is difficult to define because the diagnostic horizons used to classify soils have been destroyed or have been rearranged with heavy equipment to the extent that the horizons cannot be identified. Udorthent areas may be found at the bottom of a borrow pit or a spoil of soil layers from a borrow pit that may be adjacent to or up to a few miles from the area in which the material had formed pedogenic horizons. Within a few feet, the properties of Udorthent soil can change dramatically. Thus, wide variability is expected within the Udorthents classification. Udorthents cover 3.9 percent of SRS.

The groupings of SRS series are summarized in Table 5.1. Within these groupings, the selection of horizons for sample collection was based on major descriptive variations within the specific soil series. When correlating the data to a grouping series, the correct layer should be used. A summary of the layers sampled is presented in Table 5.2. The samples came from the central soil series of each grouping with a wide distribution in the location of the sample sites. The sample locations and descriptions are shown in Figures 5.1 through 5.6 and Table 5.3. Approximately ten percent of the samples were randomly replicated at an alternate laboratory for QA purposes. Approximately ten percent of the total sample intervals were tested for the carbon steel vs. stainless steel comparison.

5.2 Sample Collection

Soil samples were collected from target intervals at each soil boring location. These target intervals varied for each soil grouping and at each boring location. Five of the six archetypal soil groupings were comprised of a identifiable set of soil horizons (Table 5.2). The sixth archetypal soil grouping (Udorthents) did not exhibit a consistent soil horizon profile, therefore target

intervals were located at pre-determined intervals below the surface. When the target interval corresponded to a specific soil horizon, the horizon was confirmed based on a visual comparison with the written soil grouping description.

Soil samples for non-volatile organic analysis were collected by homogenizing the soil from the target interval in a stainless steel mixing bowl with stainless steel utensils. The soil in the mixing bowl was then divided into quadrants. One aliquot of sample from each quadrant was collected using a stainless steel spoon and placed in the appropriate containers. Following collection of the subsample from each of the four quadrants, the remaining sample was rehomogenized and the process repeated until all of the containers were filled. The containers were then sealed, labeled, and placed in a pre-cooled ice chest. Residual soil from the target interval was placed in core boxes for storage.

Soil samples collected for volatile organic compound analysis were not homogenized in order to minimize the loss of any volatile compounds present. Following confirmation of the proper sample horizon, a sample aliquot was immediately collected from the midpoint of the target interval. The sample was then placed in the containers such that no headspace remained. The containers were sealed immediately, labeled, and placed in a pre-cooled ice chest. Residual soil from the target interval was placed in core boxes for storage.

5.2.1 Split Spoon Samples

Samples for chemical analysis were collected with a split spoon at all soil boring sites. Samples were collected with either 2 inch outside diameter or 3 inch outside diameter stainless steel or carbon steel split spoon samplers depending on the volume of sample required to fill the containers. Each split spoon sample was collected according to the following procedure:

- 1) The sampler was decontaminated as specified in Section 5.2.3.
- 2) The split spoon was driven into the subsurface with a 140 pound hammer falling 30 inches.
- 3) Sample aliquots were removed from the split spoon sampler using a decontaminated stainless steel spatula or spoon and placed in the appropriate prelabeled containers or mixing bowls.
- 4) The samples were immediately stored in a pre-cooled ice chest at 4° C.
- 5) If the sample volume collected from the split spoon was insufficient for the required analyses, additional samples were collected immediately adjacent to the original location at the same depth interval(s).
- 6) The sample logbook and chain of custody form were then completed.

At eight locations, two borings were advanced side by side, approximately 2 to 5 feet apart. Carbon steel split spoons were used to collect samples in one boring while stainless steel split spoons were used to collect samples from the same target intervals in the adjacent boring. These samples were analyzed for various metals in order to determine if the composition of the split-spoon sampler biased the results of analyses of the soils.

5.2.2 Grab Samples

If the upper soil horizon was between 0 and 18 inches in depth, the sample was collected with a stainless steel hand trowel. Near surface soil samples collected in this manner were considered grab samples. Procedures for collection of these near surface soil samples were as follows:

- 1) The sampling tool (stainless steel hand trowel) was decontaminated as specified in Section 5.2.3.
- 2) The soil was excavated to a maximum of 6 inches with the hand trowel.
- 3) The sampling tool was decontaminated again according to the procedures outlined in Section 5.2.3.
- 4) Sample aliquots were placed in the appropriate pre-labeled containers or a stainless steel mixing bowl. The sample location was extended radially from the sample origin in order to obtain the necessary volume.
- 5) The sample logbook and chain of custody were completed.

Shallow grab samples that were tested for volatile organic compounds were collected by excavating the soil to the midpoint of the upper horizon. Soil from above the midpoint was placed in the stainless steel mixing bowl for homogenization. Soil from immediately below the mid-point was placed in a sample container for volatile organic compound analysis. The container was filled such that no headspace remained. The container was then sealed, labeled, and placed in a pre-cooled ice chest.

5.2.3 Drilling Equipment Decontamination

The drill rig and equipment were cleaned to remove excess grease, oils, or caked-on soils from previous work, upon arrival at each site. The work area of the drill rig, all downhole tools, split-spoon sampler, and subsampling instruments were decontaminated before each sample was taken in accordance with the following procedures:

- 1) Clean with tap water and phosphate-free laboratory detergent using a brush if necessary to remove particulate matter and surface films.
- 2) Rinse thoroughly with tap water.
- 3) Rinse thoroughly with distilled or deionized water.
- 4) Rinse two times with pesticide grade isopropanol solvent and allow to air dry for as long as possible.
- 5) Rinse thoroughly with distilled or deionized water and allow to air dry for as long as possible.
- 6) Wrap with aluminum foil, if appropriate, to prevent contamination if equipment is going to be stored or transported.

An alternate decontamination procedure consisted of steam cleaning instead of Steps 1 through 3 above. Decontamination continued with Steps 4 through 6. Personnel involved with the decontamination procedures wore surgical inner gloves with nitrile outer gloves which were washed with soapy water and rinsed with distilled or deionized water immediately prior to handling

any equipment used in sampling. After steam cleaning, tools and equipment were stored on plastic sheeting to avoid contamination.

5.3 Sample Analysis

Chemical and physical analyses were performed on soil samples collected during the SRS Soil Study. The analyses performed included metals and inorganic ions, volatile and semi-volatile organic compounds, radionuclides, cation exchange, and mineralogy. These parameters are listed on Tables 5.4 and 5.5 for metaTRACE and Weston (quality control laboratory) laboratories, with corresponding reference methods. The parameters selected were intended to characterize the levels of naturally occurring trace elements and to determine physical, chemical, and mineralogical parameters for use in calculating the attenuation of contaminants.

Agricultural parameters were measured in an attempt to assess the bulk geochemical character of the soils. The agricultural parameters include cation exchange capacity (CEC), exchangeable base metals, exchangeable acidity, and pH. Cation exchange capacity (CEC) is a measure of the capacity of the soil to retain elements on the ion exchange sites associated with particle surfaces. The CEC is largely a function of the clay content and the organic matter content of the soil. Therefore, small changes in clay or organic matter content of the soil may have significant influences on the chemistry of the soil profile. The mineralogy of the clay fraction also has a significant affect on CEC; specifically, kaolinitic soils have much lower CECs than illitic or smectitic. The relative dominance of acidic or basic cations in the soil is expressed by the base saturation percentage as a proportion of the CEC. Base saturation is defined as the sum of the exchangeable basic cations, calcium, magnesium, potassium, and sodium. Exchangeable acidity is defined as the sum of the acidic cations, i.e., aluminum and hydrogen. The cation exchange capacity then represents the sum of the exchangeable base metals and exchangeable acidity of a soil. The parameter pH is another important property of soil in that it affects the availability and transport of the various elements. At a low pH, for example, the acid cations are predominant and basic cations are relatively less available.

The majority of the analytical procedures follow reference methods specified in EPA document SW-846, entitled "Test Methods For Evaluating Solid Wastes," Third Edition. Reference methods for the agricultural and radiological parameters were taken from other standard procedure manuals, as specified on the table. With two exceptions, all analyses were conducted by metaTRACE Laboratories. Weston Analytics performed analyses of split samples collected for quality control purposes and X-ray diffraction analysis was performed by Conoco. Quality control samples were denoted by a "C" in the sample identification number field of the data summary in Appendix D.

The thirty-two samples from several horizons in representative soil series were characterized by X-ray diffraction analysis at Conoco Research. X-ray diffraction analyses of whole soils and clay separates were used along with modeling of the diffraction patterns to identify the minerals present and to quantify their abundances. Samples were prepared and analyzed using the procedure outlined below.

An aliquot of approximately 3 grams of sample was oven dried and then ground to less than 32 micrometers in a uniform particle size grinder. The powder was side packed into sample holder for X-ray diffraction analysis on a Siemens D-500 diffractometer. The analysis was done by step scanning in 0.02° increments over the range of 2 to $52^\circ 2\theta$ with 0.6 seconds counting time at each step. The diffractometer was equipped with a 1° divergence slit and 0.15° receiving slits. Quantification was done by matching peak intensities against files of standard minerals for each phase identified in the sample. The quantification of quartz with this system is very good, however, the clay fraction of the whole-soil samples is relatively poor with an estimated error of ± 20 percent of the value given. A normalization procedure at the end of the quantification routine was used to spread this error over other values in the sample.

For clay mineral analysis approximately ten grams of sample were dispersed in distilled-deionized water in a 250 ml centrifuge bottle. Samples which could not be completely dispersed were washed by centrifuging and re-dispersed. The fraction of the sample less than 2 micrometers in diameter was then separated by centrifugation at a fixed speed for a known length of time. Immediately after the separation, the supernatant was filtered through a 0.45 micrometer Millipore filter. The clay film from the filter was transferred to a glass slide by pressing the filter on the slide and peeling off the filter. The sample was allowed to air-dry prior to the first x-ray diffraction analysis. All of the samples were subjected to four hours of exposure to ethylene glycol vapors at 70° C prior to the second x-ray diffraction analysis. Heat treatment of some of the samples at 350°C for one hour was required to identify the vermiculite by collapsing the interlayer structure. The x-ray diffraction was carried out as above except that only the range from 2 to 32° was scanned. Several samples were run using 4 second/step counting times to enhance the signal to noise ratio and provide more definitive peak profiles for quantitative analysis.

A comparison of stainless steel and carbon steel split spoon samplers was also performed during this study. Samples were collected using each type of split spoon from identical soil intervals at adjacent boring locations. All samples collected with a carbon steel split spoon sampler were denoted by an "A" suffix in Appendix D, and those collected with a stainless steel split spoon were denoted with a "B" suffix. Soil samples collected for comparison were only tested for the presence of metals.

A summary of parameters tested, and a list of field, duplicate and stainless/carbon steel samples collected is specified in Tables 5.6 through 5.10 for each soil grouping.

5.4 Statistical Methods

Statistical interpretation of environmental data has been addressed by investigators in a variety of disciplines. As a result, a large number of useful techniques have been developed to answer specific questions. A description of the various statistical methods used to answer specific questions about the soils at SRS is presented below.

The procedures for comparing two statistical populations are of two types: those for paired data, and those for independent data sets. Examples of paired data are (i) measurements of two pollutants on each of n field samples, (ii) measurements of a pollutant on air filters collected at two adjacent locations for n time periods, and (iii) measurements of a pollutant on both leaves and roots of the same n plants. Independent data sets are those for which there is no natural way to pair the data. For example, if n soil samples are collected at each of two hazardous waste sites, there may be no rational way to pair a pollution measurement for one site with a pollution measurement for the other site.

Within the SRS Soil Study, two sampling investigations were conducted where inferences about the differences between two sampled populations are required. In the first investigation, soil cores were taken adjacent to each other using stainless steel and carbon steel samplers. The objective was to determine whether or not either of the two samplers contribute to any of the measured constituents and/or parameters. The second investigation was to compare chemical data from duplicate (split) samples analyzed by two separate laboratories currently under contract at SRS. Both scenarios discussed above represent "dependent sampling" in that paired samples were taken at randomly selected locations. This type of sampling is a requirement for a paired difference experiment which is often advantageous for comparison of independent populations. The objective of the comparison study is to determine if a difference existed between the true means of the sampled populations.

A paired difference experiment can provide more information about the difference between population means than an independent sample experiment. The paired difference procedure removes the variability due to the dimension on which the observations are paired (e.g., the natural variability of concentrations across soil types and layers for the carbon/stainless steel test). The removal of the variability due to this extra dimension is called blocking, and the paired difference experiment is a simple example of a randomized block experiment. However, half the degrees of freedom are sacrificed in the t statistic when a paired difference design is used instead of an independent sample design. This is a loss of information, and unless this loss is more than compensated for by the reduction in variability obtained by blocking (pairing), the paired difference experiment will result in a net loss of information about the difference in the true means. In the background soil study, the pairing significantly reduces the variability, thus blocking was used.

To use the paired difference t-test, the differences known as residuals must follow the normal distribution. The differences between the paired measurements are used to make inferences about the mean of the population of differences, which is equal to the difference between the true means of the two sampled populations. For example, the mean of the sample population of differences equals the difference between the population means. Thus, the null hypothesis is that the difference in the true means is zero. The alternate hypothesis being that a difference does exist between the two means. The test statistic is a one-sample t, since we are now analyzing a single sample of differences. The test statistic, t, is found by the following

$$t = \frac{\bar{x}_d}{s_d} \sqrt{n_d}$$

where

$\bar{x}_d$	=	Sample Mean Difference
s_d	=	Sample Standard Deviation Of Differences
n_d	=	Number of Differences

To find the rejection region, the probability of rejecting the null hypothesis, α , must be chosen. Then, the null hypothesis is rejected if $t < -t_{\alpha/2}$ or $t > t_{\alpha/2}$ where $t_{\alpha/2}$ is based on $(n_d - 1)$ degrees of freedom. The assumptions for this test are 1) the population of differences is approximately normally distributed and 2) the sample differences are randomly selected from a population of differences.

When the assumption of a normal distribution for the population of differences is not satisfied as required for use of the t-test, the Wilcoxon Signed Rank Test or another of the paired difference tests may be appropriate. Some of these are distribution-free or non-parametric statistical tests (i.e., they do not require the assumption that the observations themselves or their averages have a normal distribution). When data are paired, we can compare the two populations by looking at the sign or the magnitude of the set of n differences $D_i = x_{2i} - x_{1i}$, $i = 1, 2, 3, \dots, n$. The sign test uses the signs and the Wilcoxon signed rank test uses the magnitudes. The sign test can be used no matter what the underlying distribution may be. The test is simple to compute and can also accommodate a few ND (not detected) concentrations. It is more versatile than the Wilcoxon signed rank test since the latter test requires that the underlying distribution be symmetric (though not necessarily normal) and that no NDs be present. The sign test statistic, B , is the number of pairs (x_{1i}, x_{2i}) for which $x_{1i} < x_{2i}$, that is, the number of positive differences D_i . The magnitudes of the D_i are not considered; only their signs are. If any D_i is zero so that a + or - sign cannot be assigned, this data pair is dropped from the data set and n is reduced by 1. The statistic B is used to test the null hypothesis. The null hypothesis, H_0 , for this test is that the median of the population of all possible differences is zero, that is, x_{1i} is as likely to be larger than x_{2i} as x_{2i} is likely to be larger

than x_{1j} . If the number of + and - signs are about equal, there is little reason to reject H_0 . Friedman's test is an extension of the sign test from two paired populations to one or a number of related populations. The underlying distribution need not be normal or even symmetric. Also, a moderate number of ND values can be accommodated without seriously affecting the test conclusions. However, no missing values are allowed. The null hypothesis is that there is no tendency for one population to have larger or smaller values than any other of the other populations. The usual alternate hypothesis is that at least one population tends to have larger values than one or more of the other populations. However, the Wilcoxon Rank Sign Test will usually have more power than the sign test to detect differences between the two populations and was thus chosen for the background soil study.

The Wilcoxon signed rank test can be used instead of the sign test if the underlying distribution is symmetric, though it need not be a normal distribution. The Wilcoxon test (not to be confused with the Wilcoxon rank sum test) is more complicated to compute than the sign test because it requires computing and ranking of the paired differences. In most situations it should have greater power to find differences in two populations than does the sign test. Since this is a paired difference experiment, the differences between the measurements are analyzed. However, the nonparametric approach requires that the ranks of the absolute values of the differences between the measurements be calculated. The tied absolute differences are assigned the average of the ranks they would receive if they were unequal but successive measurements. After the absolute differences are ranked, the sum of the ranks of the positive differences and the sum of the negative differences are computed. The nonparametric hypothesis can then be tested. The null hypothesis for this test is that the probability distributions for the two sampled populations are identical. The alternate hypothesis is that the probability distribution for sampled population 1 is shifted to the right or left of the probability distribution of the sampled population 2. The test statistic is equal to the smaller of the positive and negative rank sums. The smaller the value of the test statistic, the greater will be the evidence to indicate that the two probability distributions differ in location. The rejection region for the test statistic can be determined by consulting standard references tables. The assumptions for this test are 1) a random sample of pairs of observations has been taken and 2) the absolute differences in the paired observations can be ranked. No assumptions have to be made about the form of the population probability distributions. However, the effectiveness of the Wilcoxon test will, like the Student's t-test, be reduced if other sources of contamination are introduced.

Table 5.1. SRS Soil Study Taxonomic Name for Soil Series Found on SRS

<u>Series Name</u>	<u>Taxonomic Name</u>
Ailey	Loamy, siliceous, thermic Arenic Kanhapludults
Albany	Loamy, siliceous, thermic Grossarenic Paleudults
Blanton	Loamy, siliceous, thermic Grossarenic Paleudults**
Chastain	Fine, mixed, acid, thermic Typic Fluvaquents
Dorovan	Dysic, thermic Typic Medisaprists
Dothan	Fine-loamy, siliceous, thermic Plinthic Kandiudults
Eunola	Fine-loamy, siliceous, thermic Aquic Hapludults
Fluvaquents	Fluvaquents
Fuquay	Loamy, siliceous, thermic Arenic Plinthic Kandiudults
Hornsville	Clayey, kaolinitic, thermic Aquic Hapludults
Kinston	Fine-loamy, mixed, nonacid, thermic Typic Fluvaquents
Lakeland	Thermic, coated Typic Quartzipsamments
Lucy	Loamy, siliceous, thermic Arenic Kandiudults
Neeses	Clayey, kaolinitic, thermic Typic Hapludults
Norfolk	Fine-loamy, siliceous, thermic Typic Paleudults**
Ochlockonee	Coarse-loamy, siliceous, acid, thermic Typic Udifluvents
Ocilla	Loamy, siliceous, thermic Aquic Arenic Paleudults
Ogeechee	Fine-loamy, siliceous, thermic Typic Ochraqults
Orangeburg	Fine-loamy, siliceous, thermic Typic Kandiudults
Pickney	Sandy, siliceous, thermic Cumulic Humaquepts
Rembert	Clayey, kaolinitic, thermic Typic Ochraqults
Shellbluff	Fine-silty, mixed, thermic Fluventic Dystrochrepts
Smithboro	Clayey, kaolinitic, thermic Aeric Paleaquults
Tawcaw	Fine, kaolinitic, thermic Fluventic Dystrochrepts
Toccoa	Coarse-loamy, siliceous/acid, thermic Typic Udifluvents
Troup	Loamy, siliceous, thermic Grossarenic Kandiudults
Udorthents	Udorthents
Vaocluse	Fine-loamy, siliceous, thermic Typic Kanhapludults*
Wagram	Loamy, siliceous, thermic Arenic Kandiudults
Williman	Loamy, siliceous, thermic Arenic Ochraqults

* Some are Hapludults

** Some are Kandiudults

Table 5.1 (Continued)

SRS Soil Study Groupings (Summary)	
	Percent of Plant Site
Grouping 1:	
Blanton	21
Troup	10.3
Albany	0.5
Wagram	2.9
Lucy	1.2
Total for Grouping 1	35.9
Grouping 2:	
Orangeburg	3.4
Norfolk	1.6
Total for Grouping 2	5.0
Grouping 3:	
Fuquay	11.3
Dothan	7.9
Total for Grouping 3	19.2
Grouping 4:	
Ailey	1.2
Vaucluse	6.9
Total for Grouping 4	8.1
Grouping 5:	
Lakeland	4.3
Grouping 6:	
Udorthent	3.9
Total for All Groupings	76.4

Table 5.2 General Soil Horizon Descriptions

The following are general descriptions of the soil horizons found in the six major soil groupings during the SRS Soils Study at the Savannah River Plant. Although variability was found to exist among soil borings of the same series several distinguishing features were apparent in the horizons unique to each. Each description reflects the major characteristics and properties of the soil horizons. Any significant compositional variability found in a particular soil horizon is noted and discussed. The layer thicknesses for the other series within a grouping should be adjusted as appropriate.

Blanton (Grouping 1)

Soil Horizon	Depth Interval (inches)	Description
First (AP)	0 - 6	fine-grained, olive gray to olive black, well sorted, subangular, trace silt, trace organic material, moist.
Second (E1,E2,E3)	6 - 65	fine-grained, grayish orange to dark yellowish orange, well sorted, angular to subangular, trace silt/clay, trace opaques, moist.
Third (Bt1, Bt2)	65 - 90	fine to medium-grained, light brown to moderate reddish brown, moderately well sorted, angular to subangular, with clay (5-20%), mottled, moist.
Fourth (Parent)	120 - 132	fine-grained, pale yellowish orange to moderate reddish brown, well to moderately sorted, angular to subangular, with clay (5-10%), moist.

Table 5.2 (Cont.)
General Soil Horizon Descriptions

Orangeburg (Grouping 2)

Soil Horizon	Depth Interval (inches)	Description
First (AP)	0 - 6	fine-grained, olive black, well sorted, angular to subangular, trace silt, trace organic material, moist.
Second (Bt1,Bt2)	6 - 26	sandy (40-45%), light brown to moderate reddish brown, hard; fine to medium - grained, moderately well sorted, angular to subangular, moist.
Third (Bt3,Bt4)	26 - 34	sandy (40-45%), light brown, hard; fine to coarse-grained, poorly sorted, angular to subangular, trace pebbles, moist.
Fourth (Bt5)	34 - 75	sandy (40-45%), light brown, hard; fine to coarse-grained, poorly sorted, angular to subangular, trace pebbles, moist, acidic.
Fifth (Parent)	120 - 132	sandy (35-40%), light brown to grayish orange to grayish purple, firm to hard, mottled; fine to coarse-grained, poorly sorted, angular to subangular, trace muscovite, moist.

Table 5.2 (Cont.)
General Soil Horizon Descriptions

Euquay (Grouping 3)

Soil Horizon	Depth Intervals (inches)	Description
First (AP)	0 - 6	fine-grained, olive black to dark yellowish brown, well sorted, angular to subangular, trace silt, trace organic material, moist.
Second (E1,E2)	6 - 40	fine-grained, grayish orange to yellowish gray, well sorted, angular to subangular, trace silt, moist.
Third (Btv1, Btv2)	40 - 84	sandy (40-45%), light brown to moderate reddish brown, hard, mottled; fine to medium-grained, moderately well sorted, angular to subangular, trace plinthite nodules, moist. This interval tended to be composed of varying amounts of sand and clay. In some borings this horizon was a sandy clay and in others a clayey sand
Fourth (Parent)	120 - 132	sandy (25-30%), moderate reddish brown, hard, sometimes mottled; fine to medium-grained, moderately sorted, subangular, moist.

Table 5.2 (Cont.)

General Soil Horizon Descriptions

Vaughan (Grouping 4)

Soil Horizon	Depth Intervals (inches)	Description
First (A,E,Bt1)	0 - 16	<p>fine to medium-grained, olive black to light brown to grayish orange, moderately sorted, angular to subangular, trace silt, moist.</p> <p>Trace organic material in upper 9 inches. High percentage of clay sometimes found in lower 6 inches of this horizon.</p>
Second (Bt2,Bt3)	16 - 48	<p>sandy (30-35%), light brown, firm; fine to medium-grained, moderately sorted, angular to subangular, moist.</p> <p>The sand/clay ratio is variable within this horizon. This horizon consists mostly of sand in one boring. Gravel and pebbles sometimes encountered.</p>
Third (C)	48 - 79	<p>fine to coarse-grained, light brown to very pale orange to grayish orange, moderately poorly sorted, angular to subangular, with clay/silt (5-10%), moist.</p>
Fourth (Parent)	120 - 132	<p>fine to coarse-grained, grayish orange, moderately to poorly sorted, angular to subangular, with clay/silt (5-10%), moist.</p>

Table 5.2 (Cont.)
General Soil Horizon Descriptions

Lakeland (Grouping 5)

Soil Horizon	Depth Intervals (inches)	Description
First (A1,A2)	0 - 6	fine-grained, olive black to pale brown, well sorted, angular to subangular, trace silt, trace organic material, moist.
Second (C1,C2,C3)	6 - 80	fine-grained, dark yellowish orange to grayish orange, well sorted, angular to subangular, trace silt, moist. In a majority of these borings the color changed to very pale orange between 60 and 72 inches.
Third (Parent)	120 - 132	fine to coarse-grained, light brown to pale red purple, poorly sorted, angular to subangular, with clay (5-10%), moist.

Table 5.2 (Cont.)

General Soil Horizon Descriptions

Udorthent (Grouping 6)

Udorthent areas are generally the result of construction work and pit filling. There are no uniform characteristics for this soil grouping. The eight soil borings tested in the SRS Soils Study showed a wide compositional variability. Varying amounts of gravels, sands, and clays were encountered in these borings and no two borings were similar in lithology. Thus, a general soil description can not be formulated for the Udorthent soil grouping. Depth intervals sampled were: First (0 - 12 inches), Second (12 - 36 inches), and Third (48 - 60 inches).

Table 5.3. Soil Boring Coordinates

SITE ID	SRP N	SRP E	SERIES
BSS 1	90,532	78,598	Blanton
BSS 2	95,318	82,743	Lakeland
BSS 3	98,098	71,525	Fuquay
BSS 4	86,104	81,171	Orangeburg
BSS 6	97,184	41,132	Blanton
BSS 7	96,099	43,067	Fuquay
BSS 8	72,281	84,950	Fuquay
BSS 9	70,468	87,894	Blanton
BSS 10	63,148	85,332	Orangeburg
BSS 11	103,768	45,841	Orangeburg
BSS 12	95,572	48,098	Vaocluse
BSS 13	84,171	61,158	Udorthent
BSS 20	55,815	88,311	Udorthent
BSS 21	53,978	89,879	Fuquay
BSS 22	51,960	89,644	Lakeland
BSS 23	52,013	78,642	Blanton
BSS 24	52,622	68,514	Vaocluse
BSS 30	34,396	83,916	Udorthent
BSS 31	33,658	84,184	Udorthent
BSS 32	34,105	87,995	Fuquay
BSS 33	37,729	89,258	Blanton
BSS 34	29,663	48,323	Orangeburg
BSS 35	33,348	54,468	Blanton
BSS 36	33,331	53,944	Udorthent
BSS 40	85,680	40,440	Orangeburg
BSS 41	84,253	35,616	Lakeland
BSS 42	87,219	37,347	Fuquay
BSS 43	92,268	40,436	Blanton
BSS 44	103,665	74,473	Fuquay
BSS 45	105,482	73,220	Blanton
BSS 46	93,938	65,113	Orangeburg
BSS 47	24,350	52,465	Vaocluse
BSS 48	23,016	51,477	Lakeland
BSS 49	22,770	53,381	Fuquay
BSS 50	91,416	45,717	Orangeburg
BSS 51	107,468	79,970	Lakeland
BSS 52	88,820	107,440	Lakeland
BSS 53	109,512	58,513	Udorthent
BSS 54	108,583	55,457	Orangeburg
BSS 55	77,592	49,801	Udorthent
BSS 56	71,752	37,622	Lakeland
BSS 57	35,691	19,734	Lakeland
BSS 58	43,993	33,304	Udorthent
BSS 59	40,335	46,585	Vaocluse

Table 5.4 Analytical Methods - metaTRACE Labs

Parameter	Method	Procedure	Reference Document
Aluminum	6010	ICP	EPA SW846
Arsenic	7060	AA, Furnace	EPA SW846
Barium	6010	ICP	EPA SW846
Cadmium	6010	ICP	EPA SW846
Chromium	6010	ICP	EPA SW846
Copper	6010	ICP	EPA SW846
Iron	6010	ICP	EPA SW846
Lead	7421	AA, Furnace	EPA SW846
Mercury	7471	Manual Cold-Vapor	EPA SW846
Nickel	6010	ICP	EPA SW846
Potassium	6010	ICP	EPA SW846
Silver	6010	ICP	EPA SW846
Sodium	6010	ICP	EPA SW846
Zinc	6010	ICP	EPA SW846
Lithium	6010	ICP	EPA SW846
Magnesium	6010	ICP	EPA SW846
Manganese	6010	ICP	EPA SW846
Selenium	7740	AA, Furnace	EPA SW846
Cyanide	9010	Colorimetric	EPA SW846
Chloride	S300	IC	EPA 600/4-79-020
Fluoride	S300	IC	EPA 600/4-79-020
Nitrate	S300	IC	EPA 600/4-79-020
Nitrite	S300	IC	EPA 600/4-79-020
Phosphorous	S300	IC	EPA 600/4-79-020
Sulfate	S300	IC	EPA 600/4-79-020
pH	9045	Electrometric	EPA SW846
Total Organic Carbon	9060	Carbonaceous Analyzer	EPA SW846
Total Organic Halogens	9020	Carbon Adsorption	EPA SW846
Cation Exchange Capacity	9080	Ammonium Acetate	EPA SW846
Exchangeable Acidity	6H2a		USDA, 1967
Exchangeable Base Metals	5B1		USDA, 1967
Gross Alpha	900.0		EPA 600/4-80-032
Gross Beta	900.0		EPA 600/4-80-032
Uranium	900.0		EPA 600/4-80-032
Strontium	900.0		HASL-300
Particle Size Dist.	D421, D422		ASTM Vol. 408
Appendix VIII Semi-Volatiles	8270	EPA SW846	
Appendix VIII Volatiles	8240	EPA SW846	
Appendix VIII Metals	6010/760/	EPA SW846	
	7421/7470/	EPA SW846	
	7741/7841	EPA SW846	
Appendix VIII Pesticides	8080/8140	EPA SW846	
Appendix VIII Herbicides	8150	EPA SW846	
Appendix VIII Dioxins/Furans	8280	EPA SW846	

Table 5.5

Analytical Methods - Weston Labs

Parameter	Method	Reference Procedure	Document
Aluminum	6010	ICP	EPA SW846
Arsenic	7061	Gaseous Hydride	EPA SW846
Barium	6010	ICP	EPA SW846
Cadmium	6010	ICP	EPA SW846
Chromium	6010	ICP	EPA SW846
Copper	6010	ICP	EPA SW846
Iron	6010	ICP	EPA SW846
Lead	7421	AA, Furnace	EPA SW846
Mercury	7471	Manual Cold-Vapor	EPA SW846
Nickel	6010	ICP	EPA SW846
Potassium	6010	ICP	EPA SW846
Silver	6010	ICP	EPA SW846
Sodium	6010	ICP	EPA SW846
Zinc	6010	ICP	EPA SW846
Lithium	6010	ICP	EPA SW846
Magnesium	6010	ICP	EPA SW846
Manganese	6010	ICP	EPA SW846
Selenium	7741	Gaseous Hydride	EPA SW846
Cyanide	9010	Colormetric	EPA SW846
Sulfate	9038	Turbidometric	EPA SW846
pH	9045	Electrometric	EPA SW846
Total Organic Carbon	9060	Carbonaceous Analyzer	EPA SW846
Total Organic Halogens	9020	Carbon Adsorption	EPA SW846
Cation Exchange Capacity		*SCS	
Exchangeable Acidity		*SCS	
Exchangeable Base Metals		*SCS	
Gross Alpha			HASL-300
Gross Beta			HASL-300
Uranium	711B		EPA Standard Methods
Strontium			HASL-300
Particle Size Dist.	---	---	
Appendix IX Semi-Volatiles	8270		EPA SW846
Appendix IX Volatiles	8240		EPA SW846
Appendix IX Metals	6010/7060/ 7421/7470/ 7741/7841		EPA SW846 EPA SW846 EPA SW846
Appendix IX Pesticides	8080/8140		EPA SW846
Appendix IX Herbicides	8150		EPA SW846
Appendix IX Dioxins/Furans	8280		EPA SW846

SCS - Soil Conservation Service technical notes document supplied by SRP.

Table 5.6 Sample Specifications For Blanton Soil Series

PARAMETER	MATRIX	FIELD SAMPLES	DUPLICATE SAMPLES	STAINLESS/ CARBON	TOTAL SAMPLES
Metals and inorganic ions	Soil	32	4	3	39
Soil pH	Soil	32	4	-	36
Total Organic Carbon	Soil	32	4	-	36
Total Organic Halogens	Soil	32	4	-	36
Cation Exchange Capacity	Soil	32	4	-	36
Exchangeable Acidity	Soil	32	4	-	36
Exchangeable Base Metals	Soil	32	4	-	36
Gross Alpha	Soil	32	4	-	36
Gross Beta	Soil	32	4	-	36
Uranium	Soil	32	4	-	36
Strontium	Soil	32	4	-	36
Particle Size Distribution	Soil	4	1	-	5
Appendix VIII	Soil	3	0	-	3
X-Ray Diffraction	Soil	8	0	-	8

Table 5.7 Sample Specifications For Orangeburg Soil Series

PARAMETER	MATRIX	FIELD SAMPLES	DUPLICATE SAMPLES	STAINLESS/ CARBON	TOTAL SAMPLES
Metals and inorganic ions	Soil	40	5	12	57
Soil pH	Soil	40	5	-	45
Total Organic Carbon	Soil	40	5	-	45
Total Organic Halogens	Soil	40	5	-	45
Cation Exchange Capacity	Soil	40	5	-	45
Exchangeable Acidity	Soil	40	5	-	45
Exchangeable Base Metals	Soil	40	5	-	45
Gross Alpha	Soil	40	5	-	45
Gross Beta	Soil	40	5	-	45
Uranium	Soil	40	5	-	45
Strontium	Soil	40	5	-	45
Particle Size Distribution	Soil	4	1	-	5
Appendix VIII	Soil	3	0	-	3
X-Ray Diffraction	Soil	10	0	-	10

Table 5.8 Sample Specifications For Fuquay Soil Series

PARAMETER	MATRIX	FIELD SAMPLES	DUPLICATE SAMPLES	STAINLESS/ CARBON	TOTAL SAMPLES
Metals and inorganic ions	Soil	32	4	6	42
Soil pH	Soil	32	4	-	36
Total Organic Carbon	Soil	32	4	-	36
Total Organic Halogens	Soil	32	4	-	36
Cation Exchange Capacity	Soil	32	4	-	36
Exchangeable Acidity	Soil	32	4	-	36
Exchangeable Base Metals	Soil	32	4	-	36
Gross Alpha	Soil	32	4	-	36
Gross Beta	Soil	32	4	-	36
Uranium	Soil	32	4	-	36
Strontium	Soil	32	4	-	36
Particle Size Distribution	Soil	5	1	-	6
Appendix VIII	Soil	3	1	-	4
X-Ray Diffraction	Soil	8	0	-	8

Table 5.9 Sample Specifications For Vacluse Soil Series

PARAMETER	MATRIX	FIELD SAMPLES	DUPLICATE SAMPLES	STAINLESS/ CARBON	TOTAL SAMPLES
Metals and inorganic ions	Soil	16	4	4	24
Soil pH	Soil	16	4	-	20
Total Organic Carbon	Soil	16	4	-	20
Total Organic Halogens	Soil	16	4	-	20
Cation Exchange Capacity	Soil	16	4	-	20
Exchangeable Acidity	Soil	16	4	-	20
Exchangeable Base Metals	Soil	16	4	-	20
Gross Alpha	Soil	16	4	-	20
Gross Beta	Soil	16	4	-	20
Uranium	Soil	16	4	-	20
Strontium	Soil	16	4	-	20
Particle Size Distribution	Soil	2	1	-	3
Appendix VIII	Soil	2	1	-	3

Table 5.10 Sample Specifications For Lakeland Soil Series

PARAMETER	MATRIX	FIELD SAMPLES	DUPLICATE SAMPLES	STAINLESS/ CARBON	TOTAL SAMPLES
Metals and inorganic ions	Soil	24	4	2	30
Soil pH	Soil	24	4	-	28
Total Organic Carbon	Soil	24	4	-	28
Total Organic Halogens	Soil	24	4	-	28
Cation Exchange Capacity	Soil	24	4	-	28
Exchangeable Acidity	Soil	24	4	-	28
Exchangeable Base Metals	Soil	24	4	-	28
Gross Alpha	Soil	24	4	-	28
Gross Beta	Soil	24	4	-	28
Uranium	Soil	24	4	-	28
Strontium	Soil	24	4	-	28
Particle Size Distribution	Soil	4	1	-	5
Appendix VIII	Soil	3	2	-	5
X-Ray Diffraction	Soil	6	0	-	6

Table 5.11 Sample Specifications For Udorthent Soil Series

PARAMETER	MATRIX	FIELD SAMPLES	DUPLICATE SAMPLES	STAINLESS/ CARBON	TOTAL SAMPLES
Metals and inorganic ions	Soil	24	4	3	31
Soil pH	Soil	24	4	-	28
Total Organic Carbon	Soil	24	4	-	28
Total Organic Halogens	Soil	24	4	-	28
Cation Exchange Capacity	Soil	24	4	-	28
Exchangeable Acidity	Soil	24	4	-	28
Exchangeable Base Metals	Soil	24	4	-	28
Gross Alpha	Soil	24	4	-	28
Gross Beta	Soil	24	4	-	28
Uranium	Soil	24	4	-	28
Strontium	Soil	24	4	-	28
Particle Size Distribution	Soil	5	2	-	7
Appendix VIII	Soil	3	0	-	3

Figure 5.1 Sample Locations for Grouping One (Blanton) Soils

Figure 5.2 Sample Locations for Grouping Two (Orangeburg) Soils

Figure 5.3 Sample Locations for Grouping Three (Fuquay) Soils

Figure 5.4 Sample Locations for Grouping Four (Vaucluse) Soils

Figure 5.5 Sample Locations for Grouping Five (Lakeland) Soils

Figure 5.6 Sample Locations for Grouping Six (Udorthent) Soils

47/48

6.0 Results

6.1 Current Study

The soils from unimpacted areas of SRS are typical of soils found in moderately aggressive weathering environments such as the southeast United States. The temperate climate and relatively high rainfall result in leached soils that have low concentrations of metals. The primary clay mineral is kaolinite. A similar age, climate and moisture regime governed the formation of most of the various soils at SRS. Thus, the various geochemical delineations tend to be more similar than different. A few notable exceptions were found; these are discussed below. The data for metals, inorganic anions, organic compounds, radionuclides, and indicator parameters are summarized for the six soil series that were identified as representative of the 29 soil series at SRS.

Geochemical results are summarized for each parameter, first for all samples, and then by soil series and layer. The median, minimum, maximum, mean, and standard deviation of values are presented in the tables and significant trends within soil groupings and between soil horizons are noted in the text. For some parameters, a large percentage of values were censored as they were present in concentrations below the detection limit of the instrument. This censoring affects the mean values and standard deviation values presented. If only a portion of the data are censored, the mean is based on substitution of a random uniform deviate between zero and the detection limit for each censored result. This has the effect of minimizing the bias on the mean and standard deviation. In many cases, the data are censored at several different detection limits. In these cases, the modal detection limit (the most common value) was used as a nominal or reference value. For distributions that are heavily censored (i.e., the calculated mean is below the modal detection limit) or entirely censored, a value of less than the modal detection limit is presented for the mean and no standard deviation is calculated. Note that the median value tends to be a more representative measure of central tendency than the arithmetic mean if the underlying distribution is unknown. The raw data are presented in Appendix D by constituent, soil series, and layer.

6.1.1 Metals

In general, metal concentrations increase with depth and in proportion to the clay content of the soil. The upper soil horizons are generally more highly leached, and exhibit lower concentrations, than the lower horizons and the parent material.

Aluminum - Tables 6.1 and 6.2

Aluminum was detected in all 168 samples. The data range from approximately 715 ug/g to approximately 53,530 ug/g with a median of 8060 ug/g. The median concentrations for the various depth intervals range from approximately 2050 ug/g to 28500 ug/g. The medians of the Blanton, Fuquay and Orangeburg series tend to increase in the lower horizons that contain fine grained materials concentrated from above. The concentrations are relatively higher in the Orangeburg series in all depth intervals than in any other series. The clay content of this series is greater than any of the others investigated. In the Vaucluse series, the concentration decreases in the lower intervals.

Arsenic - Tables 6.1 and 6.3

Arsenic was detected in approximately one half of the 168 samples. The data range from <0.5 ug/g to 15.2 ug/g with a median of <2 ug/g. Eighteen of the 80 detected values are below the nominal detection limit of 2 ug/g. No clear trends are evident within intervals or series. Note that arsenic was used as a component of agricultural chemicals in the period before SRS existed. Thus, a few of the detected values may be a result of farming activities in the 1930's through 1950.

Antimony - Table 6.1

Antimony was measured in the Appendix VIII samples; only 3 of the 17 samples were reported as detected. Two of these samples (11.4 ug/g and 15.2 ug/g) were above the nominal detection limit of 10.6 ug/g. The remaining detected value was 5.5 ug/g.

Barium - Tables 6.1 and 6.4

Barium was detected in all but one of the 168 samples. The data range from approximately 1 ug/g to approximately 77 ug/g with a median of 11 ug/g. The median concentrations for the various depth intervals range from approximately 2.4 ug/g to 59 ug/g. The medians of the Blanton, Fuquay and Orangeburg series tend to increase in the lower horizons that contain fine grained materials concentrated from above. In the Vacluse series, the concentration decreases in the lower intervals. This pattern is similar to the results for aluminum.

Beryllium - Table 6.1

Beryllium was measured in the Appendix VIII samples; only 6 of the 17 samples were reported as detected. One of these samples (0.43 ug/g) was above the nominal detection limit of 0.4 ug/g. The remaining detected values ranged from 0.12 to 0.4 ug/g.

Cadmium - Tables 6.1 and 6.5

Cadmium was not detected in over 75% of the 168 samples. The data range from 0.12 ug/g to 1.19 ug/g with a median of <0.6 ug/g. Twenty-two of the 34 detected values are below the nominal detection limit of 0.6 ug/g. No clear trends are evident within intervals or series.

Chromium - Tables 6.1 and 6.6

All 168 sample results for chromium are reported as detected. The data range from approximately 1.3 ug/g to approximately 105 ug/g with a median of 13.6 ug/g. The median concentrations for the various depth intervals range from approximately 3.5 ug/g to 33.3 ug/g. The medians of the Blanton, Fuquay and Orangeburg series tend to increase in the lower horizons that contain fine grained materials concentrated from above. The concentrations are relatively lower in the Lakeland series with all depth intervals considered than any other series. The clay content of this series is less than any of the others investigated.

Cobalt - Table 6.1

Cobalt was measured in the Appendix VIII samples; only 7 of the 17 samples were reported as detected. Two of these samples (2.2 ug/g and 5.3 ug/g) were above the nominal detection limit of 2 ug/g. The remaining detected values ranged from 0.46 to 1.8 ug/g.

Copper - Tables 6.1 and 6.7

Copper was detected in over 99% of the 168 samples. The data range from approximately 0.36 ug/g to approximately 14 ug/g with a median of 3.1 ug/g. The median concentrations for the various depth intervals range from approximately 1.45 ug/g to 7.45 ug/g. The medians of the Blanton, Fuquay and Orangeburg series tend to increase in the lower horizons that contain fine grained materials concentrated from above. The concentrations are relatively higher in the Orangeburg series within all depth intervals considered than in any other series. The clay content of this series is greater than any of the others investigated. In the Vacluse series, the

concentration decreases in the lower intervals. This pattern is similar to the results reported for aluminum.

Iron - Tables 6.1 and 6.8

Iron was detected in all 168 samples. The data range from approximately 886 ug/g to approximately 79,600 ug/g with a median of 8551 ug/g. The median concentrations for the various depth intervals range from approximately 1416 ug/g to 26,475 ug/g. The medians of the Blanton, Fuquay and Orangeburg series tend to increase in the lower horizons that contain fine grained materials concentrated from above. Lakeland exhibited low iron concentrations.

Lead - Tables 6.1 and 6.9

Lead was detected in over 90% of the 168 samples. The data range from approximately <1 ug/g to approximately 16.7 ug/g with a median of 5.1 ug/g. The median concentrations for the various depth intervals range from approximately 1.6 ug/g to 8.6 ug/g. The medians of the Blanton, Fuquay and Orangeburg series tend to increase in the lower horizons that contain fine grained materials concentrated from above. The concentrations are relatively higher in the Orangeburg series within all depth intervals considered than in any other series. The clay content of this series is greater than any of the others investigated. This pattern is similar to the results reported for aluminum.

Lithium - Table 6.1

Lithium was not detected in over 95% of the 168 samples. The data range from <10 ug/g to 19 ug/g with a median of <10 ug/g. None of the 5 detected values are below the nominal detection limit of 10 ug/g. All of the detected values are in the lower intervals of the Orangeburg series and the Fuquay series.

Magnesium - Tables 6.1 and 6.10

Magnesium was detected in all 168 samples. The data range from approximately 12.9 ug/g to approximately 759 ug/g with a median of 100 ug/g. The median concentrations for the various depth intervals range from approximately 28.6 ug/g to 278 ug/g. The medians of the Orangeburg series tend to increase in the lower horizons that contain fine grained materials concentrated from above. The concentrations are relatively higher in the Orangeburg series within all depth intervals considered than in any other series. The clay content of this series is greater than any of the others investigated. This pattern is similar to the results reported for aluminum.

Manganese - Tables 6.1 and 6.11

Manganese was detected in approximately 80% of the 168 samples. The data range from approximately <1.6 ug/g to approximately 498 ug/g with a median of 7.9 ug/g. The median concentrations for the various depth intervals range from approximately <2.3 ug/g to 102 ug/g. The medians of the various series tend to increase in the parent material.

Mercury - Tables 6.1 and 6.12

Approximately 80% of the 168 sample results for mercury are reported as not detected. The data range from <0.01 ug/g to 0.89 ug/g with a median of <0.1 ug/g. None of the 24 detected values are below the nominal detection limit of 10 ug/g. The concentrations do not exhibit a clear pattern in terms of soil series or layer.

Nickel - Tables 6.1 and 6.13

Nickel was detected in approximately 70% of the 168 samples. The data range from approximately 0.11 ug/g to approximately 17.9 ug/g with a median of 3.8 ug/g. The median concentrations for the various depth intervals range from approximately <2 ug/g to 8.8 ug/g. The medians of the Orangeburg and Fuquay series tend to increase in the lower horizons that contain fine grained materials concentrated from above. The concentrations are relatively higher in the Orangeburg series within all depth intervals considered in than any other series. The clay content of this series is greater than any of the others investigated. This pattern is similar to the results reported for aluminum.

Potassium - Tables 6.1 and 6.14

Potassium was not detected in approximately 60% of the 168 samples. The data range from 28.6 ug/g to 1118 ug/g with a median of <180 ug/g. The concentrations do not exhibit a clear pattern in terms of soil series or layer; also, the laboratory provided widely varying detection limits making further interpretation difficult.

Selenium - Tables 6.1 and 6.15

Selenium was not detected in over 70% of the 168 samples. The data range from <0.2 ug/g to <4 ug/g (the highest actual value measured was 1.66 ug/g) with a median of <0.4 ug/g. Five of the 47 detected values are below the nominal detection limit of 0.4 ug/g. Layers with detected values tend to be in the lower intervals of the various series.

Silver - Tables 6.1 and 6.16

Silver was not detected in over 90% of the 168 samples. The data range from 0.01 ug/g to 1.8 ug/g with a median of <0.65 ug/g. Six of the 10 detected values are below the nominal detection limit of 0.6 ug/g. The concentrations exhibit no clear pattern in terms of soil series or layer.

Sodium - Tables 6.1 and 6.17

Sodium was detected in over 98% of the 168 samples. The data range from approximately <7 ug/g to approximately 760 ug/g with a median of 42.5 ug/g. The median concentrations for the various depth intervals range from approximately 28 ug/g to 85 ug/g. The concentrations are relatively higher in the Orangeburg series with all depth intervals considered than any other series.

Thallium - Table 6.1

Thallium was measured in the Appendix VIII samples; None of the 17 samples were reported as detected above the nominal detection limit of 1.5 ug/g.

Vanadium - Table 6.1

Vanadium was measured in the Appendix VIII samples; Over 90% of the 17 sample results were reported as detected. The data range from approximately 3.6 ug/g to approximately 72.1 ug/g with a median of 21.2 ug/g.

Zinc - Tables 6.1 and 6.18

Zinc was detected in all of the 168 samples. The data range from approximately 1.8 ug/g to approximately 267 ug/g with a median of 10.3 ug/g. The median concentrations for the various depth intervals range from approximately 5.3 ug/g to 17.9 ug/g. The medians of the Orangeburg, Fuquay and Blanton series tend to increase in the lower horizons that contain fine grained materials

concentrated from above. The concentrations are relatively higher in the Orangeburg series with all depth intervals considered than any other series. The clay content of this series is greater than any of the others investigated. This pattern is similar to the results reported for aluminum.

6.1.2 Other Inorganic Parameters

Soil samples were collected from six distinct soil series (Blanton, Fuquay, Lakeland, Orangeburg, Udorthent, and Vacluse) for the measurement of following inorganic constituents: chloride, cyanide, fluoride, phosphate, sulfate, nitrate, and nitrite. The data for these constituents is summarized across all soil types and layers in Table 6.19. One objective of the SRS Soils Study was to develop background information to assess areas of potential release of hazardous constituents from solid waste management units. A list of "hazardous" constituents is defined for this purpose by EPA in 40 CFR part 261. Cyanide is the only inorganic constituent included in the SRS Soil Study that is included on this list. Although the additional inorganic constituents are not listed as hazardous constituents in 40 CFR 261, elevated levels of these ions may serve as indicators of potential impact and might form the basis for further investigation based on site specific conditions. A discussion of the results for each of the "other inorganic parameters" tested follows:

Bromide - Table 6.19

Bromide was detected in only 10% of the 168 samples. The data range from 0.25 ug/g to 3.7 ug/g with a median of <1.25 ug/g. One of the 12 detected values is below the nominal detection limit of 1.25 ug/g.

Chloride - Tables 6.19 and 6.20

Chloride was detected in approximately 90% of the 168 samples. The data range from approximately 0.7 ug/g to approximately 118 ug/g with a median of 2.6 ug/g. The median concentrations for the various depth intervals range from approximately <1.5 ug/g to 4.95 ug/g. There is no clear pattern of concentrations as a function of layer or series.

Cyanide - Table 6.19

None of the 168 sample results for cyanide are reported above the nominal detection limit of 0.25 ug/g.

Fluoride - Table 6.19

Approximately 90% of the 168 sample results for fluoride are reported as not detected. The data range from <0.25 ug/g to 4.3 ug/g with a median of <1.25 ug/g. None of the 19 detected values are below the nominal detection limit of 1.25 ug/g.

Nitrate - Tables 6.19 and 6.21

Nitrate was detected in approximately 70% of the 168 samples. The data range from approximately <0.1 ug/g to approximately 44.4 ug/g with a median of 1.0 ug/g. The median concentrations for the various depth intervals range from approximately <0.5 ug/g to 1.7 ug/g. There is no clear pattern of concentrations as a function of layer or series.

Nitrite - Table 6.19

None of the 168 sample results for nitrite are reported above the nominal detection limit of 1.25 ug/g.

Phosphate - Table 6.19

Phosphate was not detected in over 90% of the 168 samples. The data range from <0.25 ug/g to 13.7 ug/g with a median of <5 ug/g. None of the 10 detected values are below the nominal detection limit of 5 ug/g.

Sulfate - Tables 6.19 and 6.22

Sulfate was detected in approximately 70% of the 168 samples. The data range from approximately <5 ug/g to approximately 25.1 ug/g with a median of 8.05 ug/g. The median concentrations for the various depth intervals range from approximately <5 ug/g to 18.0 ug/g. There is no clear pattern of concentrations as a function of layer or series.

6.1.3 Organic Compounds

Organic constituents were measured in soil samples from six distinct soil series (Blanton, Fuquay, Lakeland, Orangeburg, Udorthent, and Vacluse). The parameters investigated are total organic carbon and total organic halogens. The data for these constituents is summarized across all soil types and layers in Table 6.23. The total organic carbon content of a soil is an indicator of the concentration of natural soil organic matter, such as humic and fulvic acids, as well as organic soil material that was introduced as a contaminant. The total organic halogen content is comprised of the halogenated hydrocarbons, specifically a hydrocarbon containing fluorine, chlorine, bromine, and iodine. Since organic halogens do not occur naturally in significant quantities, the presence of halogenated hydrocarbons indicates either contamination at the sampling location or an induced laboratory artifact. The total organic halogen data, combined with the Appendix VIII analyses discussed below, were intended to assess possible laboratory artifacts. A discussion of the results for each the organic constituents follows:

Total Organic Carbon - Tables 6.23 and 6.24

Total organic carbon was detected in all of the 168 samples. The data range from approximately 32 ug/g to approximately 14493 ug/g with a median of 644 ug/g. The median values tend to decrease from the top depth intervals to the bottom intervals with similar variability throughout the series. This decrease in concentration is explained by the accumulation of natural organic compounds from plant and animal decay in the topsoil interval. These constituents are biologically recycled in the topsoil zone and therefore are not as concentrated in the subsurface horizons.

Total Organic Halogens - Table 6.23

Total organic halogens were not detected in over 98% of the 168 samples. The two reported values are 10 ug/g and 17.4 ug/g (neither of the 2 detected values are below the nominal detection limit of 10 ug/g). While the two positive results are likely artifacts, the data suggest that there was little systematic problem with artifacts of total organic halogens in the SRS Soil Study.

Appendix VIII Analyses

Seventeen samples were tested for the presence of the Appendix VIII organic constituents consisting of volatiles, semivolatiles, pesticides, and PCBs. Organic compounds were detected in all 17 samples tested. A total of six different compounds were detected, however, not all the parameters were detected in all 17 samples (Figure 6.1). The parameters detected include: bis (2-ethylhexyl) phthalate, acetone, methylene chloride, dieldrin, endosulfan sulfate, and butylbenzyl phthalate. Bis (2-ethylhexyl) phthalate occurred in 10 samples of a concentration range of 10 to 4,800 ppb, acetone occurred in 13 samples with a range of 42 to 1,600 ppb, methylene chloride occurred in 15 samples with a range of 4 to 70 ppb, dieldrin occurred in 1 sample at a concentration of 9.6 ppb, endosulfan sulfate occurred in 5 samples with a range of 28 to 3940 ppb, and butylbenzyl phthalate occurred in 1 sample at a concentration of 10 ppb.

6.1.4 Radiological Parameters

Soil samples were collected from six distinct soil series (Blanton, Fuquay, Lakeland, Orangeburg, Udorthent, and Vaucluse) for the measurement of background radiation. The parameters measured are gross alpha, gross beta, uranium, and ^{90}Sr . The data for these constituents is summarized across all soil types and layers in Table 6.26. Additional radioactive species have been measured in previous studies of background soils at SRS; these results are presented in section 6.2. A discussion of the results from the current study follows:

Gross Alpha - Tables 6.26 and 6.27

Gross alpha was detected in approximately 60% of the 168 samples. The data range from approximately <4 pCi/g to approximately 20 pCi/g with a median of 5.4 pCi/g. The median concentrations for the various depth intervals range from approximately <4 pCi/g to 7.45 pCi/g. The concentrations are higher in the lower zones of Blanton, Fuquay, Lakeland and Orangeburg. These zones are accumulating fine grained materials from above.

Nonvolatile Beta - Tables 6.26 and 6.28

Nonvolatile beta was detected in approximately 60% of the 168 samples. The data range from approximately <5 pCi/g to approximately 23 pCi/g with a median of 8.1 pCi/g. The median concentrations for the various depth intervals range from approximately <5 pCi/g to 12 pCi/g. The concentrations are higher in the lower zones of Blanton, Fuquay and Orangeburg. These zones are accumulating fine grained materials from above.

Strontium 90 - Table 6.26

None of the 168 sample results for ^{90}Sr are reported above the nominal detection limit of 1.0 pCi/g.

Uranium - Tables 6.26 and 6.29

Uranium was detected in approximately 50% of the 168 samples. The data range from approximately <1 pCi/g to approximately 4.7 pCi/g with a median of 1.0 pCi/g. The median concentrations for the various depth intervals range from approximately <1 pCi/g to 1.45 pCi/g. The concentrations are higher in the lower zones of Blanton, Fuquay and Orangeburg. These zones are accumulating fine grained materials from above.

6.1.5 Agricultural Parameters

Soil samples were collected from six distinct soil series (Blanton, Fuquay, Lakeland, Orangeburg, Udorthent, and Vaucluse) for the measurement of background agricultural parameters. The parameters investigated were cation exchange capacity, exchangeable acidity, exchangeable base metals, and pH. The data for these constituents is summarized across all soil types and layers in Table 6.30. Many of the parameters measured are closely related to clay content of the soil. This results in higher concentrations in the series that characteristically have argillic horizons (zones of subsoil clay enrichment due to illuviation), including the Fuquay and Orangeburg. Below the zone of weathering, clay content and CEC are generally lower than the weathered intervals above; the background data reflect this trend. Of the soil series investigated, the CEC for the Orangeburg series is highest. This observation was anticipated as the Orangeburg series has the highest concentration of clay of any series studied. The trends for the cation exchange capacity are paralleled by the trends in exchangeable acidity and exchangeable base metals as expected. Final results for the agricultural parameters are still being prepared by the laboratory and will be presented in a separate report (Looney et al., 1990).

6.1.6 Mineralogical Analysis

X-ray diffraction analysis was performed on thirty two samples collected from several horizons in representative soil groupings to determine the mineralogy of the whole soil, and size-fractionated whole soil samples were examined for the mineralogy of clay-sized material. Table 6.30 lists the results of the X-ray diffraction analyses of whole soil samples. Table 6.31 lists the results of the X-ray diffraction analyses of the clay mineral fraction.

6.1.7 Carbon Steel/Stainless Steel Comparison Data

In the carbon and stainless steel comparison study, a total of 26 comparison samples were taken. The carbon steel sampler served as the primary sampler and the stainless steel sampler was used only for comparison purposes so that potential contamination from either sampler could be determined. The comparison samples taken with the stainless steel sampler were tested for a number of metals. The raw data are presented in Appendix C with the paired samples adjacent to each other and for each metal tested. A statistical summary of the carbon steel/stainless steel comparison for a number of metals is presented in Table 6.32. The table includes results for the normality test, paired difference t-test, and the Wilcoxon Signed Rank Test.

6.1.8 Laboratory Comparison Data

In the metaTRACE and Weston laboratory comparison study, a total of 25 comparison or duplicate samples were tested. The duplicate samples were tested for a number of metals, radiological and agricultural parameters, and organics. A statistical summary of the metaTRACE and Weston comparisons for a number of metals is presented in Table 6.33. The table includes results for the normality test, paired difference t-test, and the Wilcoxon Signed Rank Test.

6.2 Past Studies at SRS

Several geochemical/radiochemical studies of shallow soils have been performed at SRS. Background data were collected as part of a test of sewage sludge fertilization of pine forest (Davis and Corey, 1989, and unpublished data). Radionuclides were measured by Fay and Pickett (1987); limited radionuclide data are presented each year in the annual environmental report for SRS (e.g., Mikol, 1988; Davis et al., 1989). The data are summarized in Tables 6.34 and 6.35.

Sites for the Sewage Sludge Study were selected to represent 'sandy' and 'clayey' textured soils typical of SRS and the southeastern Coastal Plain. The study sites were used for agriculture, and were reforested when operation began in the early 1950's. As defined by Davis and Corey (1989), the clayey soils were Orangeburg and Fuquay and the sandy soils were Lucy, Wagram,

and Fuquay. The samples were a composite from the surface to 30 inches deep. The soil chemistry data from this study are summarized in Table 6.34. The concentrations of the various elements are similar in magnitude and distribution to the results from this study presented in Table 6.1 through 6.29.

Radionuclides in surface soils were measured by Fay and Pickett (1987). Nineteen sites were tested using gamma counting and neutron activation analysis. Two recent annual reports (Mikol, 1988; Davis et al., 1989) contain representative data for a few constituents. The data from these sources are summarized in Table 6.35. Sites are grouped according to proximity to sources where appropriate, and sites directly impacted by discharges to surface water (e.g. swamps) are not included in the table. As expected potassium, uranium and thorium are the parent radionuclides that contribute most of the natural radiation in background soils. Cesium, contributed by weapons testing and other atmospheric sources, is also present. Most of the background potassium, uranium, and thorium is contributed by minerals found in soil. Potassium is associated with clay minerals (correlating with other clay mineral elements such as sodium and aluminum). Most of the uranium and thorium in SRS soils is associated with the heavy mineral monazite. Monazite is a lanthanide phosphate that contains 0.5 to 1 percent uranium and 4 to 5 percent thorium. Thus the concentrations of uranium and thorium correlated with each other and with other lanthanide elements. Uranium and thorium produce a series of daughters that are also present in background soils.

6.3 Regional, National, and Global Studies

Table 6.36 provides summary statistics and ranges in background soil values for metals from previous regional, national, and global studies. Generally, several reported values are available for most metals. In some cases, however, only limited data are available (e.g., antimony). If provided in the referenced studies, the number of samples and the range of analytical values, the various means and standard deviations are included in the Table 6.36. A brief discussion of some of the major studies is provided below.

Connor and Shacklette (1975) conducted a national geochemical survey to determine background levels of various elements in rocks, soils, and plants. Their study includes a regional assessment of nine central and southern Georgia counties. In this study, three soil horizons were sampled at thirty sites and analyzed. Summary statistics and sampling locations were compiled from other field and laboratory studies since 1958. Background values are included along with factors indicating the observed variation, the analytical variation, the observed range of values, and total number of element analyses. The purpose of their study was to assess the regional background variations so data known or suspected to reflect epigenetic mineralization, or pollution and other man-induced effects were intentionally excluded. Data collection was designed to insure that estimates of the variation were unbiased and represent uncontaminated values. Nearly all of the sample suites were analyzed in a randomized sequence to circumvent effects of systematic laboratory error.

Anderson et al. (in press) report values for the distribution of Be in soils of the Piedmont and Coastal Plain physiographic regions of the Southeastern United States. Soils were collected near Athens, Ga., and on the Savannah River Site. Total Be for soils ranged from 0.3 to 30.5 ppb and was consistently higher in Piedmont soils than in Coastal Plain soils.

Additional soil geochemistry studies by Robinson (1914) and Robinson (1917) stressed the variation in soil of agricultural factors including texture, province, and condition of fertility. A comparatively small number of soil types were examined. Robinson et al. (1917) discuss the chemical variation in various soil types and provinces. Shacklette et al. (1971) conducted a soil sampling program that included 863 analyses from across the United States. Samples were collected at a depth of 8 inches. The arithmetic and geometric mean, the geometric deviation, and a

histogram showing frequencies of analytical are given for 30 elements. Prior to this study, few data were available on the abundance of elements in surficial materials of the United States. Most of the early publications discuss only elements of economic importance to mining or agriculture. For the most part, the data cannot be evaluated with reference to average, or "normal," amounts in undisturbed materials because sampling was biased toward anomalous localities.

In general, Shacklette et al , (1971) found that surficial materials of the western half of the United States generally contain more calcium, magnesium, strontium, potassium, sodium, aluminum, and barium, but contain less titanium and zirconium than do those of the eastern half. Surficial material in the Atlantic Coastal Plain tends to have lower concentrations of most metals relative to the rest of the U.S. Materials in the Basin and Range province, in parts of the Rocky Mountains, and in Maine and adjacent states generally have high metal concentrations. Shacklette and Boerngen (1984) reports values for an additional 355 samples. Samples of both studies were analyzed for 50 elements with results plotted on maps and statistically analyzed.

Global estimates on soil geochemistry are discussed in Bear (1964), Siegel (1974), Lindsay (1979), Waldron (1980), Nriagu (1980a, b, c), and Hutchinson and Meema (1987). The crust of the earth is composed principally of igneous and metamorphic rocks of granitic and basaltic composition. Since 1890 many geologists have computed averages for the major element composition of the crust based on the following general approaches: (1) averages of available analyses, (2) averages weighted in proportion to occurrence, (3) computations of an indirect nature based on the composition of sediments and various combinations of mafic and felsic rocks, and (4) abundances of elements based on crustal models. Most of these averages fall within a small range of composition. Less attention has been given by geologists to the computation of abundance of minor elements in the crust and in various types of rocks. The abundance of some minor elements still is poorly known, and the estimation of their abundance is hampered by lack of available analyses, inadequate sampling, inaccurate results of some analytical procedures, and imprecise methods of estimation.

Figure 6.1 Frequency of Occurrence of Organic Compounds in Appendix VIII Analyses.

Table 6.1. Summary Statistics for Metals Measured (all samples)

CONSTITUENT -	NUMBER	NUMBER	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
	SAMPLES	DETECTED					
			UG/G	UG/G	UG/G	UG/G	UG/G
ALUMINUM	168	168	8060.30	715.00	53530.00	11697.41	10405.91
ANTIMONY	17	3	< 10.60	5.53	15.20	< 10.60	.
ARSENIC	168	80	< 2.00	< 0.50	15.20	< 2.00	.
BARIUM	168	167	11.19	0.94	77.40	16.43	15.48
BERYLLIUM	17	6	< 0.40	< 0.12	< 1.00	< 0.40	.
CADMIUM	168	34	< 0.60	0.12	1.19	< 0.60	.
CHROMIUM	168	168	13.60	1.31	105.10	16.41	13.54
COBALT	17	7	< 1.20	0.46	5.27	< 1.50	.
COPPER	168	166	3.09	0.36	14.12	3.94	2.74
IRON	168	168	8550.80	885.90	79600.00	13341.32	13785.97
LEAD	168	161	4.62	< 1.00	16.67	5.14	3.37
LITHIUM	168	5	< 10.00	< 10.00	19.87	< 10.00	.
MAGNESIUM	168	168	99.63	12.87	759.40	133.76	117.50
MANGANESE	168	143	7.87	< 1.60	498.20	27.71	53.60
MERCURY	168	24	< 0.10	< 0.01	0.89	< 0.10	.
NICKEL	168	122	3.80	0.11	17.90	4.12	3.31
POTASSIUM	168	71	< 180.00	28.60	1118.00	< 180.00	.
SELENIUM	168	47	< 0.40	< 0.20	< 4.00	< 0.40	.
SILVER	168	10	< 0.65	0.01	1.80	< 1.00	.
SODIUM	168	166	42.54	< 7.00	760.00	61.08	80.30
THALLIUM	17	0	< 1.50	< 1.00	< 2.00	< 1.50	.
VANADIUM	17	16	21.20	3.61	72.11	27.80	22.90
ZINC	168	168	10.33	1.80	267.00	12.39	20.66

Table 6.2. Summary Statistics for Aluminum (by series and layer)

CONSTITUENT - ALUMINUM

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	2422.05	715.00	21200.00	4621.14	6770.25
	7- 61	8	8	5895.70	842.00	19510.00	8675.80	7277.95
	61- 76	8	8	14880.00	2550.00	27512.00	14799.13	7687.94
	98-121	8	8	8078.00	1969.00	14593.00	8146.00	3815.77
FUQUAY	0- 7	8	8	2334.40	1974.00	3540.00	2524.65	580.11
	8- 41	8	8	5114.50	2906.00	16550.00	7581.35	5202.97
	41- 72	8	8	20404.00	17270.00	31640.00	22178.63	4931.83
	96-120	8	8	11734.50	2072.00	26510.00	13225.05	8842.42
LAKELAND	0- 6	8	8	2053.90	1347.00	4367.60	2450.22	1185.44
	6- 81	8	8	2050.00	1221.40	8959.50	3183.91	2490.81
	98-121	8	8	4119.00	1087.20	21504.00	5727.76	6533.23
ORANGEBURG	0- 7	8	8	4633.65	3607.00	9080.00	5543.54	1989.42
	7- 24	8	8	21948.00	12460.00	50100.00	24041.50	12137.21
	22- 41	8	8	23479.00	13450.00	31000.00	22896.00	5243.35
	43- 65	8	8	28465.00	15628.00	51730.00	28699.75	10918.10
	96-119	8	8	17946.10	7651.40	53530.00	21162.95	14373.19
UDORTHEMT	U	24	24	8089.70	2899.30	43320.00	11576.67	9384.33
VAUCLUSE	0- 20	4	4	7814.75	2826.00	21510.00	9991.38	8109.75
	20- 53	4	4	8849.40	8152.50	13286.00	9784.32	2391.93
	53- 75	4	4	4969.80	4096.20	7850.00	5471.45	1641.19
	96-120	4	4	4377.50	2592.00	11330.00	5669.25	3923.80

Table 6.3. Summary Statistics for Arsenic (by series and layer)

CONSTITUENT - ARSENIC

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	2	< 1.03	< 0.50	< 2.00	< 2.00	
	7- 61	8	3	< 1.30	< 0.50	< 2.00	< 2.00	
	61- 76	8	5	< 2.35	< 0.50	7.05	2.58	2.45
	98-121	8	6	< 2.10	< 0.50	6.18	2.75	2.12
FUQUAY	0- 7	8	0	< 1.50	< 0.50	< 2.00	< 2.00	
	8- 41	8	1	< 1.73	< 0.50	< 2.00	< 2.00	
	41- 72	8	8	3.51	2.00	11.60	4.86	3.38
	96-120	8	6	2.69	< 2.00	15.20	4.29	4.78
LAKELAND	0- 6	8	1	< 2.00	< 0.50	< 2.00	< 2.00	
	6- 81	8	2	< 2.00	< 0.50	2.00	< 2.00	
	98-121	8	3	< 2.00	< 0.50	5.40	< 2.00	
ORANGEBURG	0- 7	8	3	< 2.00	< 0.50	< 2.00	< 2.00	
	7- 24	8	5	2.69	< 2.00	7.93	3.05	2.45
	22- 41	8	4	< 2.50	< 2.00	< 5.00	2.58	1.25
	43- 65	8	4	< 2.48	< 2.00	10.80	3.70	3.78
	96-119	8	4	< 2.48	< 2.00	8.42	2.84	3.16
UDORTHEM	U	24	13	< 2.32	1.95	5.99	2.72	1.89
VAUCLOSE	0- 20	4	2	< 2.00	< 1.00	5.04	2.24	2.05
	20- 53	4	3	2.67	< 2.00	4.88	2.98	1.46
	53- 75	4	2	< 2.17	< 2.00	3.11	1.98	0.93
	96-120	4	3	< 1.50	0.96	6.00	2.26	2.50

Table 6.4. Summary Statistics for Barium (by series and layer)

CONSTITUENT - BARIUM

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	9.04	2.80	25.40	11.60	8.00
	7- 61	8	7	12.10	3.00	31.60	14.83	10.69
	61- 76	8	8	12.07	6.40	25.90	14.24	7.99
	98-121	8	8	7.63	2.40	13.60	7.84	4.03
FUQUAY	0- 7	8	8	11.04	4.57	28.70	13.18	7.49
	8- 41	8	8	19.04	8.40	50.40	23.72	15.12
	41- 72	8	8	19.15	11.40	34.73	19.64	7.11
	96-120	8	8	6.90	3.00	14.87	8.02	3.95
LAKELAND	0- 6	8	8	7.90	3.00	58.20	15.47	18.55
	6- 81	8	8	7.78	3.60	32.30	10.85	9.32
	98-121	8	8	8.09	2.60	65.20	18.41	22.03
ORANGEBURG	0- 7	8	8	17.39	9.20	32.00	19.49	8.27
	7- 24	8	8	58.95	18.40	77.40	55.80	18.35
	22- 41	8	8	36.79	7.31	53.40	34.49	16.63
	43- 65	8	8	23.47	10.50	36.90	23.72	8.70
	96-119	8	8	13.06	1.37	34.20	15.21	11.36
UDORTHEM	U	24	24	7.70	1.30	35.73	9.27	8.94
VAUCLUSE	0- 20	4	4	6.58	4.90	19.10	9.29	6.62
	20- 53	4	4	5.70	3.50	12.00	6.73	3.92
	53- 75	4	4	2.69	1.40	4.20	2.74	1.16
	96-120	4	4	2.35	0.94	4.51	2.54	1.48

Table 6.5. Summary Statistics for Cadmium (by series and layer)

CONSTITUENT - CADMIUM

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	1	< 0.60	< 0.50	< 1.00	< 0.60	.
	7- 61	8	1	< 0.60	< 0.50	< 1.00	< 0.60	.
	61- 76	8	2	< 0.60	< 0.50	0.99	< 0.60	.
	98-121	8	2	< 0.60	0.27	< 1.00	< 0.60	.
FOQUAY	0- 7	8	2	< 0.60	< 0.50	< 1.00	< 0.60	.
	8- 41	8	1	< 0.60	< 0.50	< 1.00	< 0.60	.
	41- 72	8	1	< 0.60	< 0.50	< 1.00	< 0.60	.
	96-120	8	2	< 0.60	< 0.50	< 1.00	< 0.60	.
LAKELAND	0- 6	8	1	< 0.60	0.52	< 1.00	< 0.60	.
	6- 81	8	1	< 0.60	0.50	< 1.00	< 0.60	.
	98-121	8	0	< 0.60	< 0.50	< 1.00	< 0.60	.
ORANGEBURG	0- 7	8	1	< 0.60	< 0.50	1.06	< 0.60	.
	7- 24	8	2	< 0.60	0.27	< 1.00	< 0.60	.
	22- 41	8	2	< 0.60	0.12	< 1.00	< 0.60	.
	43- 65	8	1	< 0.60	0.13	< 1.00	< 0.60	.
	96-119	8	2	< 0.60	0.12	< 1.00	< 0.60	.
UDORTHEM	U	24	8	< 0.60	0.27	1.19	< 0.60	.
VAUCLUSE	0- 20	4	2	< 0.55	0.40	0.60	< 0.60	.
	20- 53	4	0	< 0.60	< 0.50	< 1.00	< 0.60	.
	53- 75	4	1	< 0.60	< 0.50	0.99	< 0.60	.
	96-120	4	1	< 0.55	0.20	< 0.60	< 0.60	.

Table 6.6. Summary Statistics for Chromium (by series and layer)

CONSTITUENT - CHROMIUM

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	3.84	1.70	27.97	7.84	8.88
	7- 61	8	8	5.50	1.80	24.54	8.13	7.36
	61- 76	8	8	18.80	3.10	32.80	18.92	10.49
	98-121	8	8	14.05	3.40	35.20	14.19	9.81
FUQUAY	0- 7	8	8	3.48	2.28	30.60	6.66	9.72
	8- 41	8	8	8.46	3.50	39.40	11.78	11.71
	41- 72	8	8	31.28	21.90	53.40	33.06	9.68
	96-120	8	8	26.30	2.33	105.10	31.95	31.26
LAKELAND	0- 6	8	8	4.26	1.31	7.10	4.34	1.74
	6- 81	8	8	4.40	3.33	6.80	4.77	1.35
	98-121	8	8	7.51	4.85	35.20	12.15	10.27
ORANGEBURG	0- 7	8	8	5.36	4.13	14.67	6.59	3.45
	7- 24	8	8	14.90	9.70	32.36	16.38	6.77
	22- 41	8	8	19.80	12.75	27.00	20.35	5.00
	43- 65	8	8	23.80	20.70	45.21	26.77	7.84
	96-119	8	8	33.30	8.80	51.97	33.26	13.52
UDORTHEAT	U	24	24	20.50	5.48	34.21	19.58	7.99
VAUCLUSE	0- 20	4	4	10.95	4.39	24.95	12.81	8.70
	20- 53	4	4	20.25	10.90	30.90	20.57	8.91
	53- 75	4	4	9.36	4.50	19.25	10.62	6.56
	96-120	4	4	8.00	1.78	36.60	13.60	15.62

Table 6.7. Summary Statistics for Copper (by series and layer)

CONSTITUENT - COPPER

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	1.99	0.36	7.01	2.24	2.07
	7- 61	8	7	1.91	< 0.60	6.15	2.17	1.82
	61- 76	8	8	5.50	0.85	8.20	4.96	2.58
	98-121	8	8	2.72	1.00	5.40	3.14	1.62
FUQUAY	0- 7	8	8	1.61	0.71	2.30	1.62	0.61
	8- 41	8	8	1.45	0.85	5.00	2.35	1.57
	41- 72	8	8	5.71	0.78	13.00	6.10	3.71
	96-120	8	8	4.58	0.64	11.10	5.25	3.40
LAKELAND	0- 6	8	8	1.90	1.00	2.70	1.85	0.52
	6- 81	8	8	2.12	1.28	5.50	2.38	1.30
	98-121	8	8	2.65	1.28	9.60	3.63	2.64
ORANGEBURG	0- 7	8	8	2.15	0.70	10.90	3.30	3.21
	7- 24	8	8	5.08	3.59	11.43	6.13	2.52
	22- 41	8	8	5.60	3.20	7.20	5.33	1.34
	43- 65	8	8	7.45	3.23	14.12	7.60	3.12
	96-119	8	8	7.00	3.00	9.90	6.64	2.30
UDORTHEM	U	24	24	3.90	1.30	10.69	4.18	2.46
VAUCLUSE	0- 20	4	4	2.47	1.01	4.80	2.69	1.57
	20- 53	4	3	3.32	< 1.00	5.20	3.01	2.29
	53- 75	4	4	2.52	2.10	3.80	2.74	0.78
	96-120	4	4	2.76	1.33	4.30	2.79	1.22

Table 6.8. Summary Statistics for Iron (by series and layer)

CONSTITUENT - IRON

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	1416.00	1200.00	21650.00	3958.14	7151.97
	7- 61	8	8	2866.10	1807.70	19390.00	6595.26	7277.11
	61- 76	8	8	17405.50	3982.00	37740.00	19548.55	13496.80
	98-121	8	8	7284.40	2700.00	31855.00	11475.72	10544.11
FUQUAY	0- 7	8	8	1721.20	885.90	2280.00	1596.77	475.65
	8- 41	8	8	3818.50	2004.00	11340.00	5148.96	3866.65
	41- 72	8	8	22205.00	16598.00	79600.00	32316.13	21606.59
	96-120	8	8	21220.00	1269.00	61000.00	25577.41	20106.45
LAKELAND	0- 6	8	8	1584.30	1416.60	2653.60	1866.60	523.61
	6- 81	8	8	2086.60	1426.00	6909.30	3019.46	2111.22
	98-121	8	8	4045.60	1313.00	26308.00	6641.07	8140.83
ORANGEBURG	0- 7	8	8	3403.20	2067.10	8526.00	4094.46	2025.27
	7- 24	8	8	11809.50	7003.10	24600.00	12867.01	5632.53
	22- 41	8	8	15257.50	7502.00	28600.00	15750.10	6225.39
	43- 65	8	8	21059.00	16699.40	35800.00	24079.92	7607.50
	96-119	8	8	26475.50	15300.00	62600.00	29637.88	15511.61
UDORTHEM	U	24	24	13032.00	3637.00	35400.00	15924.89	9485.93
VAUCLUSE	0- 20	4	4	8989.40	2024.00	33000.00	13250.70	13740.58
	20- 53	4	4	12365.50	3100.00	15371.00	10800.50	5427.56
	53- 75	4	4	6032.95	4032.00	33400.00	12374.47	14066.28
	96-120	4	4	6332.40	1790.00	65600.00	20013.70	30501.69

Table 6.9. Summary Statistics for Lead (by series and layer)

CONSTITUENT - LEAD

		NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
SERIES	LAYER							
BLANTON	10- 6	8	8	4.70	0.68	6.45	4.34	2.03
	17- 61	8	7	2.52	< 1.00	4.57	2.34	1.46
	61- 76	8	8	4.10	0.72	7.20	4.19	2.15
	98-121	8	8	5.28	0.79	7.84	4.66	2.24
FUQUAY	10- 7	8	8	4.11	2.05	5.80	4.05	1.09
	18- 41	8	8	3.06	2.02	8.60	3.56	2.12
	41- 72	8	7	6.25	3.82	8.60	5.91	1.53
	96-120	8	8	5.89	2.30	16.40	7.16	4.47
LAKELAND	10- 6	8	8	3.20	0.67	16.67	4.52	5.09
	16- 81	9	6	1.58	< 1.00	7.32	2.08	2.23
	98-121	8	6	2.40	< 1.00	6.30	2.87	2.26
ORANGEBURG	10- 7	8	8	5.80	3.96	9.04	5.90	1.59
	17- 24	8	8	8.55	5.40	15.40	9.70	3.71
	22- 41	8	8	7.73	4.10	11.60	7.46	2.44
	43- 65	8	7	8.38	6.30	13.10	8.32	2.92
	96-119	8	8	7.55	2.80	14.60	8.28	4.93
UDORTHEMT	10	24	24	3.25	1.00	13.70	4.62	3.42
VAUCLOSE	10- 20	4	4	4.65	2.38	7.20	4.72	2.15
	20- 53	4	4	4.34	3.50	6.40	4.65	1.29
	53- 75	4	4	4.16	3.26	6.00	4.40	1.15
	96-120	4	4	3.64	2.20	5.50	3.74	1.40

Table 6.10. Summary Statistics for Magnesium (by series and layer)

CONSTITUENT - MAGNESIUM

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	61.97	20.09	117.40	66.40	34.87
	7- 61	8	8	111.90	25.94	232.90	126.19	66.60
	61- 76	8	8	122.55	45.55	296.70	136.83	76.84
	98-121	8	8	76.08	43.23	163.50	89.33	43.22
FUQUAY	0- 7	8	8	58.75	40.53	96.32	63.62	16.10
	8- 41	8	8	138.20	86.15	436.10	184.75	123.68
	41- 72	8	8	213.25	158.00	514.00	254.64	121.07
	96-120	8	8	87.84	46.00	194.10	108.18	57.74
LAKELAND	0- 6	8	8	69.89	32.65	140.10	76.47	37.17
	6- 81	8	8	99.12	45.37	245.10	93.54	38.78
	98-121	8	8	71.55	25.25	254.60	97.15	72.50
ORANGEBURG	0- 7	8	8	89.53	48.42	171.50	96.27	39.33
	7- 24	8	8	278.25	115.50	759.40	347.11	239.73
	22- 41	8	8	170.45	111.60	402.80	213.91	121.44
	43- 65	8	8	224.80	122.90	519.10	287.02	161.16
	96-119	8	8	114.06	52.22	281.40	144.34	88.33
UDORTMENT	U	24	24	80.78	24.35	255.40	93.34	63.19
VAUCULUSE	0- 20	4	4	81.20	63.49	279.70	126.40	102.60
	20- 53	4	4	86.50	34.03	184.50	97.88	66.10
	53- 75	4	4	28.59	20.82	40.53	29.63	9.16
	96-120	4	4	33.22	12.87	49.66	32.24	16.20

Table 6.11. Summary Statistics for Manganese (by series and layer)

CONSTITUENT - MANGANESE

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	26.67	12.72	138.50	42.71	42.85
	7- 61	8	8	12.02	3.41	30.56	14.06	9.87
	61- 76	8	6	2.64	< 1.60	15.28	3.82	4.80
	98-121	8	7	2.64	< 1.60	12.12	3.76	3.46
FUQUAY	0- 7	8	8	62.27	7.70	92.72	53.69	31.91
	8- 41	8	8	13.53	5.63	34.43	16.29	9.92
	41- 72	8	4	< 2.41	< 1.60	15.10	5.27	6.16
	96-120	8	4	< 2.29	< 1.60	29.68	8.59	12.91
LAKELAND	0- 6	8	8	39.55	2.99	498.20	102.71	167.35
	6- 81	8	8	13.52	4.72	141.20	31.00	46.41
	98-121	8	8	5.48	3.91	169.30	26.33	57.82
ORANGEBURG	0- 7	8	8	66.83	18.61	122.30	68.88	35.74
	7- 24	8	8	102.38	13.71	241.20	110.34	79.23
	22- 41	8	7	23.92	< 1.60	72.46	27.86	23.74
	43- 65	8	8	28.24	6.05	41.90	24.25	12.86
	96-119	8	6	18.13	< 1.60	38.72	18.79	17.69
UDORTHEM	U	24	17	2.91	< 1.60	27.96	4.82	6.00
VAUCLUSE	0- 20	4	4	6.05	2.14	18.00	8.06	6.99
	20- 53	4	3	3.24	< 1.60	4.21	3.03	1.17
	53- 75	4	2	< 2.52	< 1.60	8.04	3.27	3.43
	96-120	4	3	3.37	< 1.60	8.58	3.92	3.49

Table 6.12. Summary Statistics for Mercury (by series and layer)

CONSTITUENT - MERCURY

		NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
SERIES	LAYER							
BLANTON	0- 6	8	1	< 0.10	< 0.10	0.19	< 0.10	.
	7- 61	8	3	< 0.10	< 0.10	0.15	< 0.10	.
	61- 76	8	1	< 0.10	< 0.10	0.25	< 0.10	.
	98-121	8	3	< 0.10	< 0.10	0.19	< 0.10	.
FUQUAY	0- 7	8	1	< 0.10	< 0.10	0.89	< 0.10	.
	8- 41	8	2	< 0.10	< 0.10	0.10	< 0.10	.
	41- 72	8	3	< 0.10	< 0.10	0.32	< 0.10	.
	96-120	8	1	< 0.10	< 0.10	0.22	< 0.10	.
LAKELAND	0- 6	8	0	< 0.10	< 0.10	< 0.10	< 0.10	.
	6- 81	8	1	< 0.10	< 0.10	0.10	< 0.10	.
	98-121	8	1	< 0.10	< 0.10	0.14	< 0.10	.
ORANGEBURG	0- 7	8	0	< 0.10	< 0.10	< 0.10	< 0.10	.
	7- 24	8	0	< 0.10	< 0.10	< 0.10	< 0.10	.
	22- 41	8	2	< 0.10	< 0.10	0.11	< 0.10	.
	43- 65	8	2	< 0.10	< 0.01	0.19	< 0.10	.
	96-119	8	1	< 0.10	< 0.10	0.17	< 0.10	.
UDORTHEM	U	24	2	< 0.10	< 0.10	0.15	< 0.10	.
VAUCLOSE	0- 20	4	0	< 0.10	< 0.01	< 0.10	< 0.10	.
	20- 53	4	0	< 0.10	< 0.10	< 0.10	< 0.10	.
	53- 75	4	0	< 0.10	< 0.10	< 0.10	< 0.10	.
	96-120	4	0	< 0.10	< 0.10	< 0.10	< 0.10	.

Table 6.13. Summary Statistics for Nickel (by series and layer)

CONSTITUENT - NICKEL

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	5	< 2.35	0.11	5.80	2.31	1.69
	7- 61	8	5	< 4.10	< 2.00	5.52	3.17	1.85
	61- 76	8	6	< 3.85	0.16	7.53	3.81	2.55
	98-121	8	6	< 3.45	< 2.00	9.57	3.51	2.81
FUQUAY	0- 7	8	4	< 2.55	< 2.00	8.10	3.05	2.19
	8- 41	8	6	< 4.20	< 2.00	6.24	3.57	2.17
	41- 72	8	7	5.90	< 4.20	8.35	5.50	2.27
	96-120	8	6	2.87	< 2.00	17.90	4.96	5.66
LAKELAND	0- 6	8	6	< 2.70	1.08	5.20	2.30	0.73
	6- 81	8	6	< 2.96	< 2.00	5.20	2.57	1.38
	98-121	8	4	< 2.70	< 2.00	6.76	2.63	2.49
ORANGEBURG	0- 7	8	7	< 3.86	2.00	7.69	3.56	1.99
	7- 24	8	7	8.80	< 4.20	16.78	9.13	4.04
	22- 41	8	7	7.92	< 4.20	11.40	7.26	3.10
	43- 65	8	8	6.98	3.80	13.32	7.51	3.22
	96-119	8	7	5.40	< 4.20	15.10	7.69	5.01
UDORTHEM	U	24	15	< 2.84	< 0.20	8.53	2.79	2.08
VAUCLUSE	0- 20	4	2	< 2.00	< 2.00	7.46	3.13	2.88
	20- 53	4	3	< 3.40	2.20	< 4.20	2.44	1.26
	53- 75	4	2	< 3.27	< 2.00	< 4.20	2.44	1.09
	96-120	4	3	< 2.30	1.92	6.84	3.09	2.58

Table 6.14. Summary Statistics for Potassium (by series and layer)

CONSTITUENT - POTASSIUM

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	1	< 180.00	< 40.00	< 360.00	< 180.00	.
	7- 61	8	1	< 184.00	< 40.00	< 800.00	< 180.00	.
	61- 76	8	3	< 134.80	< 40.00	< 360.00	< 180.00	.
	98-121	8	2	< 169.65	< 40.00	< 360.00	< 180.00	.
FUQUAY	0- 7	8	1	< 163.00	< 40.00	< 326.00	< 180.00	.
	8- 41	8	3	< 159.00	< 40.00	< 800.00	< 180.00	.
	41- 72	8	5	< 180.00	47.50	< 800.00	123.77	92.71
	96-120	8	3	< 180.00	< 40.00	< 326.00	< 180.00	.
LAKELAND	0- 6	8	4	< 188.00	< 40.00	< 800.00	195.79	187.51
	6- 81	8	3	< 180.00	28.60	< 800.00	< 180.00	.
	98-121	8	4	< 180.00	73.50	< 800.00	108.06	67.73
ORANGEBURG	0- 7	8	2	< 180.00	< 40.00	< 325.00	< 180.00	.
	7- 24	8	5	< 190.00	29.04	1118.00	270.91	372.19
	22- 41	8	3	< 180.00	66.37	< 325.00	< 180.00	.
	43- 65	8	6	< 175.00	56.41	< 325.00	143.31	72.09
	96-119	8	3	< 180.00	164.10	< 325.00	< 180.00	.
UDORTHEM	U	24	13	< 180.00	39.82	< 800.00	127.91	120.74
VAUCLUSE	0- 20	4	3	< 112.30	39.82	270.00	105.03	110.56
	20- 53	4	3	< 226.20	52.00	298.00	177.27	125.87
	53- 75	4	2	< 153.05	< 40.00	324.00	131.44	136.32
	96-120	4	1	< 180.00	< 40.00	< 326.00	< 180.00	.

Table 6.15. Summary Statistics for Selenium (by series and layer)

CONSTITUENT - SELENIUM

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	1	< 0.40	< 0.20	0.44	< 0.40	.
	7- 61	8	1	< 0.40	< 0.20	< 4.00	< 0.40	.
	61- 76	8	4	< 0.42	< 0.20	1.15	0.47	0.37
	98-121	8	2	< 0.40	< 0.20	0.58	< 0.40	.
FUQUAY	0- 7	8	0	< 0.40	< 0.20	< 0.40	< 0.40	.
	8- 41	8	1	< 0.40	< 0.20	< 1.00	< 0.40	.
	41- 72	8	4	< 0.86	< 0.40	< 4.00	1.11	1.07
	96-120	8	4	< 0.40	0.25	0.59	0.31	0.22
LAKELAND	0- 6	8	0	< 0.40	< 0.20	< 0.40	< 0.40	.
	6- 81	8	0	< 0.40	< 0.20	< 4.00	< 0.40	.
	98-121	8	1	< 0.40	< 0.20	0.75	< 0.40	.
ORANGEBURG	0- 7	8	0	< 0.40	< 0.20	< 0.40	< 0.40	.
	7- 24	8	3	< 0.40	0.37	0.92	< 0.40	.
	22- 41	8	4	< 0.40	0.31	0.49	0.26	0.18
	43- 65	8	3	< 0.74	< 0.40	< 4.00	< 0.40	.
	96-119	8	4	< 0.46	< 0.40	0.84	0.46	0.24
UDORTHEM	U	24	9	< 0.40	< 0.20	< 4.00	< 0.40	.
VAUCLOSE	0- 20	4	2	< 0.40	0.23	0.57	0.33	0.19
	20- 53	4	1	< 0.40	< 0.20	< 1.00	< 0.40	.
	53- 75	4	2	< 0.50	< 0.20	< 4.00	0.44	0.28
	96-120	4	1	< 0.40	< 0.20	0.45	< 0.40	.

Table 6.16. Summary Statistics for Silver (by series and layer)

CONSTITUENT - SILVER

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	1	< 0.60	0.24	< 1.00	< 1.00	.
	7- 61	8	0	< 0.60	< 0.30	< 1.00	< 1.00	.
	61- 76	8	1	< 0.60	< 0.30	< 1.00	< 1.00	.
	98-121	8	0	< 0.60	< 0.30	< 1.00	< 1.00	.
FOQUAY	0- 7	8	1	< 0.60	< 0.30	< 1.00	< 1.00	.
	8- 41	8	1	< 0.80	< 0.30	1.70	< 1.00	.
	41- 72	8	0	< 0.60	< 0.30	< 1.00	< 1.00	.
	96-120	8	1	< 0.60	0.22	< 1.00	< 1.00	.
LAKELAND	0- 6	8	1	< 1.00	< 0.30	< 1.40	< 1.00	.
	6- 81	8	0	< 1.00	< 0.30	< 1.40	< 1.00	.
	98-121	8	0	< 1.00	< 0.30	< 1.40	< 1.00	.
ORANGEBURG	0- 7	8	0	< 0.80	< 0.30	< 1.00	< 1.00	.
	7- 24	8	0	< 0.80	< 0.30	< 1.00	< 1.00	.
	22- 41	8	0	< 0.80	< 0.60	< 1.00	< 1.00	.
	43- 65	8	0	< 0.80	< 0.30	< 1.00	< 1.00	.
	96-119	8	0	< 0.80	< 0.30	< 1.00	< 1.00	.
UDORTHEM	U	24	3	< 0.80	0.01	1.80	< 1.00	.
VAUCLUSE	0- 20	4	0	< 0.80	< 0.30	< 1.00	< 1.00	.
	20- 53	4	0	< 0.80	< 0.30	< 1.00	< 1.00	.
	53- 75	4	1	< 0.84	< 0.30	< 1.00	< 1.00	.
	96-120	4	0	< 0.80	< 0.30	< 1.00	< 1.00	.

Table 6.17. Summary Statistics for Sodium (by series and layer)

CONSTITUENT - SODIUM

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	34.92	23.70	78.00	39.25	17.22
	7- 61	8	8	43.78	22.20	109.40	48.52	28.35
	61- 76	8	8	42.95	20.10	58.00	41.52	10.81
	98-121	8	8	41.50	24.00	57.60	40.22	12.05
FUQUAY	0- 7	8	8	37.65	19.60	60.04	38.44	16.51
	8- 41	8	8	42.74	19.30	72.15	43.74	20.08
	41- 72	8	8	50.60	28.60	64.60	49.89	12.71
	96-120	8	8	40.65	25.10	50.00	38.34	8.35
LAKELAND	0- 6	8	8	35.10	24.60	354.60	75.87	113.21
	6- 81	8	8	32.27	14.80	99.40	39.39	26.94
	98-121	8	7	34.12	< 7.00	123.20	46.05	36.48
ORANGEBURG	0- 7	8	8	48.21	18.30	288.00	75.83	87.20
	7- 24	8	8	79.07	33.90	210.00	89.26	56.76
	22- 41	8	8	71.80	41.00	760.00	153.96	245.38
	43- 65	8	8	85.15	25.90	351.00	132.89	127.56
	96-119	8	7	64.72	< 7.00	236.00	75.77	69.56
UDORTHEM	U	24	24	41.79	13.80	381.60	59.50	80.08
VAUCLUSE	0- 20	4	4	27.99	26.60	46.40	32.25	9.48
	20- 53	4	4	35.10	28.80	78.50	44.37	23.06
	53- 75	4	4	29.61	14.50	59.90	33.41	19.04
	96-120	4	4	36.45	18.60	70.30	40.45	22.22

Table 6.18. Summary Statistics for Zinc (by series and layer)

CONSTITUENT - ZINC

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	5.32	3.20	13.59	7.01	3.79
	7- 61	8	8	8.58	3.00	14.50	8.52	4.28
	61- 76	8	8	9.88	5.80	13.60	9.76	2.79
	98-121	8	8	10.33	3.40	24.60	11.39	6.20
FUQUAY	0- 7	8	8	6.85	4.69	12.95	7.62	2.95
	8- 41	8	8	6.61	2.20	16.80	7.70	4.66
	41- 72	8	8	13.35	4.20	19.60	12.18	5.28
	96-120	8	8	9.02	3.40	14.40	9.30	4.18
LAKELAND	0- 6	8	8	7.23	3.60	11.80	7.14	2.68
	6- 81	8	8	8.65	4.80	17.20	10.15	4.82
	98-121	8	8	8.96	4.20	12.10	8.88	2.82
ORANGEBURG	0- 7	8	8	8.26	5.20	24.60	10.23	6.23
	7- 24	8	8	17.90	12.30	28.46	18.75	5.20
	22- 41	8	8	14.76	9.00	23.94	15.28	4.45
	43- 65	8	8	13.40	9.00	33.42	15.53	7.81
	96-119	8	8	11.60	7.00	28.60	14.24	7.51
UDORTHEM	0	24	24	9.65	1.80	30.14	10.60	7.22
VAUCLOSE	0- 20	4	4	11.70	6.33	18.00	11.93	4.78
	20- 53	4	4	10.70	6.20	32.70	15.07	11.95
	53- 75	4	4	9.25	7.18	267.00	73.17	129.23
	96-120	4	4	8.83	5.00	13.90	9.14	4.13

Table 6.19. Summary Statistics for Other Inorganic Parameters Measured (all samples)

	NUMBER	NUMBER	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
	SAMPLES	DETECTED					
			UG/G	UG/G	UG/G	UG/G	UG/G
CONSTITUENT -							
BROMIDE	168	12	< 1.25	0.25	3.70	< 1.25	.
CHLORIDE	168	150	2.60	0.70	118.40	5.55	13.46
CYANIDE	168	0	< 0.25	< 0.25	< 0.50	< 0.25	.
FLUORIDE	168	19	< 1.25	< 0.25	4.30	< 1.25	.
NITRATE AS NITROGEN	168	115	1.00	< 0.10	44.40	1.79	4.05
NITRITE AS NITROGEN	168	0	< 1.25	< 0.25	< 1.25	< 1.25	.
PHOSPHATE	168	10	< 5.00	< 0.25	13.70	< 5.00	.
SULFATE	168	119	8.05	1.00	25.10	8.69	5.78

Table 6.20. Summary Statistics for Chloride (by series and layer)

CONSTITUENT - CHLORIDE

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	2.75	1.70	7.90	3.89	2.49
	7- 61	8	5	1.75	< 1.25	9.00	2.51	2.84
	61- 76	8	7	2.00	< 1.25	8.60	2.92	2.57
	98-121	8	8	2.65	1.40	11.20	3.99	3.34
FUQUAY	0- 7	8	8	3.35	2.10	5.40	3.50	1.38
	8- 41	8	4	< 1.52	< 1.25	3.20	1.43	1.07
	41- 72	8	8	3.35	1.40	10.70	4.64	3.48
	96-120	8	8	2.60	1.80	6.10	3.61	1.90
LAKELAND	0- 6	8	8	4.95	2.10	118.40	18.44	40.42
	6- 81	8	6	3.05	< 1.25	5.60	2.97	1.93
	98-121	8	6	1.60	< 1.25	50.90	8.71	17.24
ORANGEBURG	0- 7	8	8	3.25	2.00	78.50	12.61	26.64
	7- 24	8	8	1.45	1.10	1.90	1.47	0.24
	22- 41	8	7	1.80	< 1.25	4.30	1.94	1.17
	43- 65	8	8	2.55	0.70	68.60	10.87	23.37
	96-119	8	8	3.45	1.80	7.80	3.94	1.96
UDORTHEM	U	24	21	4.00	< 1.25	19.70	4.87	4.09
VAUCLUSE	0- 20	4	3	2.65	< 1.25	5.10	2.66	2.11
	20- 53	4	3	2.65	< 1.25	7.10	3.33	2.78
	53- 75	4	4	2.95	1.40	70.70	19.50	34.15
	96-120	4	4	2.80	1.60	7.10	3.57	2.50

Table 6.21. Summary Statistics for Nitrate (by series and layer)

CONSTITUENT - NITRATE AS NITROGEN

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	5	0.99	< 0.50	11.60	2.68	3.93
	7- 61	8	6	0.82	< 0.50	2.50	0.94	0.71
	61- 76	8	6	1.05	< 0.50	4.40	1.35	1.33
	98-121	8	5	0.98	< 0.50	2.60	0.98	0.89
FUQUAY	0- 7	8	5	0.94	< 0.50	2.20	0.86	0.69
	8- 41	8	7	1.04	< 0.50	2.00	1.11	0.50
	41- 72	8	7	1.30	< 0.50	2.30	1.29	0.66
	96-120	8	5	0.86	< 0.50	2.30	0.93	0.71
LAKELAND	0- 6	8	8	1.50	0.73	44.40	7.34	15.08
	6- 81	8	5	0.95	< 0.50	1.90	0.84	0.68
	98-121	8	4	< 0.85	< 0.50	3.20	1.27	1.16
ORANGEBURG	0- 7	8	7	1.35	< 0.50	22.50	4.25	7.49
	7- 24	8	8	1.70	0.99	4.20	2.17	1.13
	22- 41	8	6	1.12	< 0.50	2.30	1.04	0.74
	43- 65	8	4	< 0.85	< 0.10	7.00	1.67	2.33
	96-119	8	6	0.81	< 0.50	1.10	0.73	0.31
UDORTHEM	U	24	13	1.01	< 0.50	8.90	1.95	2.59
VAUCLUSE	0- 20	4	2	< 1.45	< 0.50	3.00	1.48	1.44
	20- 53	4	2	< 1.15	< 0.50	2.10	1.06	1.04
	53- 75	4	3	0.84	< 0.50	4.70	1.61	2.11
	96-120	4	1	< 0.50	< 0.50	1.20	< 0.50	.

Table 6.22. Summary Statistics for Sulfate (by series and layer)

CONSTITUENT - SULFATE

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	10.85	6.50	18.20	10.99	4.15
	7- 61	8	8	8.90	7.70	16.90	11.27	3.85
	61- 76	8	7	9.50	< 5.00	14.30	8.75	3.50
	98-121	8	3	< 5.00	< 5.00	14.30	< 5.00	.
FUQUAY	0- 7	8	8	10.15	6.40	19.50	11.11	4.28
	8- 41	8	8	11.10	7.30	19.20	12.11	3.84
	41- 72	8	6	6.00	4.40	10.50	6.25	1.99
	96-120	8	1	< 5.00	< 5.00	10.50	< 5.00	.
LAKELAND	0- 6	8	8	11.20	7.10	19.90	12.09	4.81
	6- 81	8	8	8.50	7.40	11.30	9.07	1.38
	98-121	8	7	11.35	< 5.00	17.80	10.30	4.65
ORANGEBURG	0- 7	8	8	10.60	5.80	14.30	9.90	3.12
	7- 24	8	8	16.95	14.10	20.70	17.41	2.76
	22- 41	8	7	14.90	< 5.00	18.50	13.74	5.72
	43- 65	8	6	< 5.90	1.00	21.40	8.22	7.89
	96-119	8	2	< 5.00	4.90	6.80	< 5.00	.
UDORTHEM	U	24	10	< 5.00	2.60	21.20	< 5.00	.
VAUCLUSE	0- 20	4	4	18.00	9.50	25.10	17.65	6.53
	20- 53	4	1	< 5.00	< 5.00	5.30	< 5.00	.
	53- 75	4	1	< 5.00	< 5.00	21.40	< 5.00	.
	96-120	4	0	< 5.00	< 5.00	< 5.00	< 5.00	.

Table 6.23. Summary Statistics for Bulk Organic Constituents (all samples)

CONSTITUENT -	NUMBER	NUMBER						
	SAMPLES	DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD	DEVIATION
			UG/G	UG/G	UG/G	UG/G	UG/G	UG/G
TOTAL ORGANIC CARBON	168	168	644.50	32.00	14493.00	1725.43	2490.07	
TOTAL ORGANIC HALOGENS	168	2	< 10.00	< 10.00	17.40	< 10.00	.	

Table 6.24. Summary Statistics for Total Organic Carbon (by series and layer)

CONSTITUENT - TOTAL ORGANIC CARBON

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				UG/G	UG/G	UG/G	UG/G	UG/G
BLANTON	0- 6	8	8	4234.50	3080.00	8842.00	4754.63	1884.25
	7- 61	8	8	1108.50	300.00	4838.00	1516.25	1483.40
	61- 76	8	8	614.50	290.00	1429.00	668.88	387.35
	98-121	8	8	357.00	270.00	860.00	441.13	200.15
FUQUAY	0- 7	8	8	4424.00	2957.00	13146.00	6068.38	3846.25
	8- 41	8	8	577.00	301.00	1270.00	730.50	351.37
	41- 72	8	8	595.50	394.00	1330.00	704.13	354.20
	96-120	8	8	312.50	121.00	920.00	378.38	254.46
LAKELAND	0- 6	8	8	7265.00	908.00	14493.00	7183.13	4678.50
	6- 81	8	8	441.00	220.00	4555.00	930.88	1468.86
	98-121	8	8	672.00	202.00	1646.00	676.75	449.10
ORANGEBURG	0- 7	8	8	3324.50	2499.00	5480.00	3442.13	932.90
	7- 24	8	8	1576.50	619.00	2678.00	1576.25	664.76
	22- 41	8	8	933.50	625.00	2615.00	1139.63	617.40
	43- 65	8	8	719.50	399.00	1272.00	765.38	340.73
	96-119	8	8	479.00	257.00	1176.00	522.25	281.42
UDORTMENT	U	24	24	340.50	32.00	5260.00	572.17	1033.12
VAUX LUSE	0- 20	4	4	3930.00	971.00	5703.00	3633.50	2317.17
	20- 53	4	4	662.50	263.00	3236.00	1956.00	2860.07
	53- 75	4	4	261.50	90.00	487.00	275.00	163.52
	96-120	4	4	190.50	79.00	233.00	173.25	65.96

Table 6.25. SRS Soil Study Appendix VIII Organic Compounds Detected

Organic Compound	Frequency of Occurrence	Concentration Range (ppb)
bis (2-ethylhexyl) phthalate	10	10 - 4,800
acetone	13	42 - 1,600
methylene chloride	15	4 - 70
dieldrin	1	9.6
endosulfan sulfate	5	28.2 - 3940
butylbenzyl phthalate	1	10

Table 6.26. Summary Statistics for Radionuclides (all samples)

CONSTITUENT -	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
			PCI/G	PCI/G	PCI/G	PCI/G	PCI/G
GROSS ALPHA	168	103	5.40	< 4.00	20.00	5.25	2.97
NONVOLATILE BETA	168	108	8.10	< 5.00	23.00	7.78	4.09
STRONTIUM-90	168	0	< 1.00	< 1.00	< 1.00	< 1.00	.
URANIUM	168	85	1.00	< 1.00	4.70	1.05	0.75

Table 6.27. Summary Statistics for Gross Alpha (by series and layer)

CONSTITUENT - GROSS ALPHA

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				PCI/G	PCI/G	PCI/G	PCI/G	PCI/G
BLANTON	0- 6	8	2	< 4.00	2.90	9.40	< 4.00	.
	7- 61	8	3	< 4.00	3.80	9.90	< 4.00	.
	61- 76	8	7	6.10	5.20	8.50	6.42	1.38
	98-121	8	5	< 5.80	< 4.00	10.00	5.44	2.37
FUQUAY	0- 7	8	3	< 4.95	< 4.00	6.90	< 4.00	.
	8- 41	8	5	< 5.59	< 4.00	10.00	4.65	3.13
	41- 72	8	6	7.05	< 4.00	9.00	6.31	2.43
	96-120	8	7	7.00	3.90	20.00	8.46	5.72
LAKELAND	0- 6	8	3	< 4.45	3.80	6.80	< 4.00	.
	6- 81	8	1	< 4.10	< 4.00	< 5.00	< 4.00	.
	98-121	8	2	5.00	< 4.00	6.10	< 4.00	.
ORANGEBURG	0- 7	8	3	< 4.25	< 4.00	10.00	< 4.00	.
	7- 24	8	5	< 6.40	< 4.00	7.20	5.28	2.10
	22- 41	8	7	6.85	4.70	8.70	6.49	1.86
	43- 65	8	6	6.05	< 4.00	11.00	6.18	3.52
	96-119	8	7	5.75	4.90	8.10	5.91	1.79
UDORTHEM	U	24	21	7.25	3.90	11.00	7.14	2.65
VAUCLUSE	0- 20	4	4	7.45	4.40	7.80	6.77	1.59
	20- 53	4	3	< 5.90	4.10	7.80	5.72	1.87
	53- 75	4	2	< 4.65	< 4.00	5.00	3.68	1.48
	96-120	4	1	< 4.50	< 4.00	5.90	< 4.00	.

Table 6.28. Summary Statistics for Nonvolatile Beta (by series and layer)

CONSTITUENT: NONVOLATILE BETA

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				PCI/G	PCI/G	PCI/G	PCI/G	PCI/G
BLANTON	0- 6	8	2	< 6.00	< 5.00	10.00	< 6.00	.
	7- 61	8	4	< 7.50	< 6.00	12.00	7.61	3.08
	61- 76	8	6	7.75	6.20	14.00	8.09	3.52
	98-121	8	6	8.15	6.50	16.00	8.56	4.10
FUQUAY	0- 7	8	4	< 7.80	< 6.00	9.90	6.62	2.27
	8- 41	8	3	< 7.00	< 6.00	13.00	< 6.00	.
	41- 72	8	7	12.00	< 7.00	15.00	11.34	3.34
	96-120	8	6	11.50	< 6.00	16.00	10.33	4.40
LAKELAND	0- 6	8	2	< 6.50	< 6.00	12.00	< 6.00	.
	6- 81	8	2	< 6.50	< 6.00	9.70	< 6.00	.
	98-121	8	3	< 7.00	< 6.00	13.00	< 6.00	.
ORANGEBURG	0- 7	8	4	< 6.60	< 6.00	9.00	4.62	3.56
	7- 24	8	7	8.45	< 6.00	13.00	8.84	3.02
	22- 41	8	6	8.90	< 6.00	14.00	8.18	4.59
	43- 65	8	7	9.25	< 6.00	14.00	9.13	3.80
	96-119	8	7	11.50	< 7.00	15.00	10.57	3.51
UDORTHEM	U	24	22	9.85	6.40	23.00	9.58	4.14
VAUCLUSE	0- 20	4	3	11.50	< 6.00	14.00	10.07	4.70
	20- 53	4	3	< 8.50	6.40	11.00	7.29	4.19
	53- 75	4	2	< 7.20	< 7.00	8.80	6.34	2.14
	96-120	4	2	< 8.00	< 7.00	9.20	5.41	4.38

Table 6.29. Summary Statistics for Uranium (by series and layer)

CONSTITUENT - URANIUM

SERIES	LAYER	NUMBER SAMPLES	NUMBER DETECTED	MEDIAN	MINIMUM	MAXIMUM	AVERAGE	STANDARD DEVIATION
				PCI/G	PCI/G	PCI/G	PCI/G	PCI/G
BLANTON	0- 6	8	3	< 1.00	< 1.00	1.30	< 1.00	.
	7- 61	8	1	< 1.00	< 1.00	1.00	< 1.00	.
	61- 76	8	3	< 1.00	< 1.00	1.40	< 1.00	.
	98-121	8	5	1.05	< 1.00	2.20	1.20	0.57
FUQUAY	0- 7	8	1	< 1.00	< 1.00	3.30	< 1.00	.
	8- 41	8	1	< 1.00	< 1.00	1.80	< 1.00	.
	41- 72	8	7	1.30	< 1.00	1.60	1.27	0.24
	96-120	8	3	< 1.00	< 1.00	2.40	< 1.00	.
LAKELAND	0- 6	8	1	< 1.00	< 1.00	1.30	< 1.00	.
	6- 81	8	0	< 1.00	< 1.00	< 1.00	< 1.00	.
	98-121	8	2	< 1.00	< 1.00	1.30	< 1.00	.
ORANGEBURG	0- 7	8	3	< 1.00	< 1.00	1.80	< 1.00	.
	7- 24	8	8	1.40	1.20	1.90	1.49	0.25
	22- 41	8	6	1.25	< 1.00	2.60	1.41	0.61
	43- 65	8	6	1.20	< 1.00	3.30	1.45	0.88
	96-119	8	7	1.10	< 1.00	2.00	1.23	0.40
UDORTHEM	U	24	18	1.40	< 1.00	4.70	1.55	1.14
VAUCLUSE	0- 20	4	3	1.45	< 1.00	2.40	1.41	0.84
	20- 53	4	3	1.10	< 1.00	2.20	1.17	0.78
	53- 75	4	2	< 1.05	< 1.00	1.50	0.90	0.55
	96-120	4	2	< 1.15	< 1.00	1.60	0.87	0.68

Table 6.30. SRS Soil Study X-Ray Diffraction Analyses Of Whole Soil Samples

<u>Sample Number</u>	<u>% Quartz</u>	<u>% Clay</u>
BSS-331	96	3
BSS-332	96	3
BSS-333	94	5
BSS-334	88	1
BSS-341	96	3
BSS-342	93	6
BSS-343	88	1
BSS-344	88	1
BSS-345	93	6
BSS-411	97	2
BSS-412	97	2
BSS-413	95	4
BSS-421	100	0
BSS-422	94	5
BSS-423	90	9
BSS-424	87	12
BSS-441	97	2
BSS-442	97	2
BSS-443	88	10
BSS-444	86	13
BSS-451	96	3
BSS-452	96	3
BSS-453	89	10
BSS-454	91	8
BSS-461	96	3
BSS-462	94	5
BSS-463	93	6
BSS-464	90	9
BSS-465	82	17
BSS-511	100	0
BSS-512	100	0
BSS-513	91	8

Table 6.31. SRS Soil Study X-Ray Diffraction Analyses Of Clay Mineral Fraction

<u>Sample Number</u>	<u>Vermiculite</u>	<u>Illite</u>	<u>Kaolinite</u>
BSS-331	28.1	0.9	71.0
BSS-332	24.0	2.4	73.6
BSS-333	9.6	0.0	90.4
BSS-334	6.8	0.0	93.2
BSS-341	24.1	0.0	75.9
BSS-342	16.8	0.0	83.2
BSS-343	11.8	0.0	88.2
BSS-344	14.8	0.0	85.2
BSS-345	0.7	1.4	97.9
BSS-411	17.4	0.3	82.3
BSS-412	15.2	2.9	81.9
BSS-413	2.7	1.0	96.3
BSS-421	25.7	5.0	69.3
BSS-422	18.5	2.6	78.9
BSS-423	11.3	1.0	87.6
BSS-424	1.5	3.6	94.9
BSS-441	19.9	4.8	75.3
BSS-442	16.5	1.7	81.8
BSS-443	6.4	0.0	93.6
BSS-444	0.8	0.4	98.8
BSS-451	27.7	1.6	70.7
BSS-452	22.5	0.0	77.5
BSS-453	14.0	0.0	86.0
BSS-454	1.4	6.7	91.8
BSS-461	16.6	0.5	82.9
BSS-462	16.4	0.9	82.8
BSS-463	16.0	1.1	82.9
BSS-464	13.8	0.5	85.6
BSS-465	2.5	2.0	95.6
BSS-511	34.3	0.0	65.7
BSS-512	30.3	7.1	62.6
BSS-513	9.2	0.0	90.8

Table 6.32
Background Soil Study
Carbon Steel/Stainless Steel Sampler Comparison Summary

	W Test			Paired Difference			Wilcoxon Signed Rank Test		
	N	W	Wp	Ho	t	ta	Ho	Source	NC
Al	26	0.932	0.933	Reject					26
Ag	0								
As	24	0.906	0.930	Reject					24
Ba	26	0.800	0.933	Reject					25
Cd	8	0.935	0.851	Accept	-2.200	1.895	Reject	Stainless	26
Cr	26	0.756	0.933	Reject	-1.392	1.392	Accept		26
Cu	26	0.943	0.933	Accept					26
Fe	26	0.808	0.933	Reject					26
Hg	0								
K	10	0.979	0.869	Accept	-0.647	1.833	Accept		26
Na	26	0.478	0.933	Reject					26
Ni	17	0.971	0.910	Accept	1.746	1.746	Accept		24
Pb	24	0.930	0.930	Reject					74
Zn	26	0.949	0.933	Accept	1.271	1.714	Accept		92
									Reject
									Carbon

"N" denotes the total number of comparisons.

W Test - Test for determining whether a data set has been drawn from an underlying normal distribution.

The null hypothesis, H_0 , is that the population has a normal distribution.

H_0 is rejected at the 0.10 significance level if the test statistic, W , is less than the quantile, W_p .

Paired Difference T-Test - Test for determining whether a difference exists in a paired difference or dependent sampling experiment. The null hypothesis, H_0 , is that the difference in the true means is zero.

H_0 is rejected at the 90% confidence interval if the test statistic, t , $< -t_{\alpha}$ or $t > t_{\alpha}$ based on $(n-1)$ degrees of freedom and a two-tailed test.

Wilcoxon Signed Rank Test - Nonparametric technique used to compare two probability distributions for a paired difference design. The underlying distribution must be symmetric, though if need not be a normal distribution.

This test was used for the paired difference experiment if the H_0 of the W-Test was rejected.

H_0 is rejected at the 90% confidence interval if the test statistic, T , $\leq T_{\alpha}$ based on a two-tailed test.

The number of comparisons, NC, is based on the number of comparisons in which the difference is not zero.

The heading "Source" denotes the steel sampler that imposed the higher concentration.

Table 6.33
Background Soil Study
Laboratory Comparison Summary For Metals

	W Test			Paired Difference			Wilcoxon Signed		
	N	W	Normality Check Wp	Ho	t	T-Test ta	NC	T	Rank Test To Ho
Al	25	0.854	0.931	Reject			25	112	101 Accept
Ag	0								
As	4	0.666	0.792	Reject			4	6 pairs of data needed	
Ba	15	0.840	0.901	Reject			15	40	30 Accept
Cd	2								
Cr	25	0.833	0.931	Reject			25	78	101 Reject
Cu	17	0.940	0.910	Accept	0.598	1.746	25	161	101 Accept
Fe	25	0.747	0.931	Reject					
Hg	0								
K	10	0.970	0.869	Accept	7.736	1.833	25	35	101 Reject
Na	25	0.708	0.931	Reject					
Ni	5	0.810	0.806	Accept	2.144	2.132	21	0	68 Reject
Pb	21	0.908	0.923	Reject			23	77	83 Reject
Zn	25	0.438	0.931	Reject					

"N" denotes the number of comparisons.

W Test - Test for determining whether a data set has been drawn from an underlying normal distribution.

The null hypothesis, Ho, is that the population has a normal distribution.

Ho is rejected at the 0.10 significance level if the test statistic, W, is less than the quantile, Wp.

Paired Difference T-Test - Test for determining whether a difference exists in the true means of two populations in a paired difference or dependent sampling experiment.

The null hypothesis, Ho, is that the difference in the true means is zero.

Ho is rejected at the 90% confidence interval if the test statistic, t, < -ta or t > ta based on (n-1) degrees of freedom and a two-tailed test.

Wilcoxon Signed Rank Test - Nonparametric technique used to compare two probability distributions of a paired difference design.

The underlying distribution must be symmetric, though if need not be a normal distribution. This test is used for the paired difference experiment if the Ho of the W-Test is rejected.

The null hypothesis, Ho, for the Wilcoxon test is that the difference in the true means is zero.

Ho is rejected at the 90% confidence interval if the test statistic, T, ≤ To based on a two-tailed test.

The number of comparisons, NC, is based on the number of comparisons in which the difference is not zero.

Table 6.33
Background Soil Study
Laboratory Comparison Summary For Inorganic

N	W Test		Paired Difference		Wilcoxon Signed		
	W	Normality Check	T-Test	T	Rank Test	Ho	
Li	0						
Mg	25	0.960	0.931	0.904	1.711	Accept	
Mn	23	0.694	0.928			Reject	
Se	0						
CN	0						
SO4	0						

"N" denotes the number of comparisons.

W Test - Test for determining whether a data set has been drawn from an underlying normal distribution.

The null hypothesis, H_0 , is that the population has a normal distribution.

H_0 is rejected at the 0.10 significance level if the test statistic, W , is less than the quantile, w_p .

Paired Difference T-Test - Test for determining whether a difference exists in the true means of two populations in a paired difference or dependent sampling experiment.

The null hypothesis, H_0 , is that the difference in the true means is zero.

H_0 is rejected at the 90% confidence interval if the test statistic, t , $< -t_{\alpha}$ or $t > t_{\alpha}$ based on $n - 2$ degrees of freedom. If the difference in the true means is zero.

(n-1) degrees of freedom and a two-tailed test.

Wilcoxon Signed Rank Test - Nonparametric technique used to compare two probability distributions for a paired difference design. The underlying distribution must be symmetric, though if need not be a normal distribution. The test is a two-tailed test.

paired difference design: the underlying distribution must be symmetric, though it need not be a normal distribution. This test is used for the paired difference experiment if the H_0 of the W -Test is rejected.

The null hypothesis, H_0 , for the Wilcoxon test is that the difference in the true means is zero.

Ho is rejected at the 90% confidence interval if the test statistic, T , $\leq T_0$ based on a two-tailed test. T_0 is rejected at the 90% confidence interval if the test statistic, T , $\leq T_0$ based on a two-tailed test. T_0 is rejected at the 90% confidence interval if the test statistic, T , $\leq T_0$ based on a two-tailed test.

The number of comparisons, NC , is based on the number of comparisons in which the difference is not zero.

Table 6.33
Background Soil Study
Laboratory Comparison Summary For Radiological Parameters

	N	W Test			Paired Difference			Wilcoxon Signed Rank Test	
		W	Normality Check	Wp	Ho	t	T-Test	To	Ho
AlphaG	11	0.914	0.876	Accept		-5.831	1.812		
BetaG	10	0.977	0.869	Accept		0.471	1.833		
U	0								
Sr-90	0								

"N" denotes the number of comparisons.

W Test - Test for determining whether a data set has been drawn from an underlying normal distribution. The null hypothesis, Ho, is that the population has a normal distribution.

Ho is rejected at the 0.10 significance level if the test statistic, W, is less than the quantile, Wp.

Paired Difference T-Test - Test for determining whether a difference exists in the true means of two populations in a paired difference or dependent sampling experiment.

The null hypothesis, Ho, is that the difference in the true means is zero.

Ho is rejected at the 90% confidence interval if the test statistic, t, < -ta or t > ta based on (n-1) degrees of freedom and a two-tailed test.

Wilcoxon Signed Rank Test - Nonparametric technique used to compare two probability distributions of a paired difference design. The underlying distribution must be symmetric, though if need not be a normal distribution. This test is used for the paired difference experiment if the Ho of the W-Test is rejected.

The null hypothesis, Ho, for the Wilcoxon test is that the difference in the true means is zero. Ho is rejected at the 90% confidence interval if the test statistic, T, ≤ To based on a two-tailed test.

The number of comparisons, NC, is based on the number of comparisons in which the difference is not zero.

Table 6.34. Summary of Control/Background Data for Various Constituents from Sewage Sludge Application Test Sites (Davis and Corey, 1989, and unpublished data)

All Samples (n = 287)

	Minimum	Maximum	Mean	Median	Std. Dev.	units
pH	4.09	7.17	5.18	5.20	0.29	pH
total nitrogen	80.00	760.00	219.30	190.00	117.44	ppm
mercury	ND	0.51	0.08	0.07	0.08	ppm
copper	1.00	21.00	5.91	5.00	4.00	ppm
potassium	50.0	707.0	235.7	192.0	133.8	ppm
zinc	1.00	37.00	12.06	10.00	6.39	ppm
calcium	28	46110	946	154	5085	ppm
iron	1700	79400	9788	5800	11165	ppm
magnesium	30.0	1645.0	114.9	79.0	128.7	ppm
nickel	ND	42.00	10.80	9.00	8.09	ppm
sodium	4.0	370.0	15.8	11.0	28.4	ppm
manganese	39.0	460.0	153.9	135.0	76.0	ppm
lead	ND	27.00	4.20	ND	6.14	ppm
exchangeable base metals	0.10	6.53	1.08	1.04	0.69	meq/100g

Clay Soils (n = 216)

pH	4.09	7.17	5.20	5.24	0.31	pH
total nitrogen	80.00	760.00	211.99	170.00	120.80	ppm
mercury	ND	0.31	0.07	0.06	0.07	ppm
copper	1.00	16.00	5.75	5.00	3.44	ppm
potassium	50.0	616.0	234.7	199.5	125.5	ppm
zinc	4.00	27.00	11.55	10.00	5.61	ppm
calcium	28	46110	1142	164	5784	ppm
iron	1700	79400	10462	5850	12453	ppm
magnesium	30.0	1645.0	116.3	80.0	140.8	ppm
nickel	ND	40.00	9.72	9.00	6.64	ppm
sodium	4.0	370.0	16.8	11.0	31.7	ppm
manganese	39.0	365.0	141.1	129.5	68.1	ppm
lead	ND	27.00	4.44	1.00	6.07	ppm
exchangeable base metals	0.10	6.53	1.22	1.15	0.66	meq/100g

Sandy Soils (n = 71)

pH	4.69	5.68	5.13	5.14	0.19	pH
total nitrogen	90.00	620.00	241.55	220.00	104.22	ppm
mercury	ND	0.51	0.09	0.08	0.10	ppm
copper	2.00	21.00	6.39	4.00	5.35	ppm
potassium	57.0	707.0	238.9	186.0	157.8	ppm
zinc	1.00	37.00	13.61	11.00	8.19	ppm
calcium	46	13130	351	133	1548	ppm
iron	2000	21900	7739	5800	5228	ppm
magnesium	34.0	651.0	110.5	78.0	81.8	ppm
nickel	1.00	42.00	14.08	11.00	10.85	ppm
sodium	5.0	116.0	12.8	9.0	13.7	ppm
manganese	61.0	460.0	192.7	195.0	85.6	ppm
lead	ND	25.00	3.45	ND	6.32	ppm
exchangeable base metals	0.14	2.22	0.63	0.45	0.55	meq/100g

Table 6.35 Radionuclide Data for SRS Soils

Source: Fay and Pickett (1987)

	Minimum pCi/g	Maximum pCi/g	Median pCi/g	Mean pCi/g	S.D. pCi/g
Potassium 40	0.54	1.28	0.75	0.82	0.27
Cesium 137	0.08	0.24	0.15	0.15	0.04
Thallium 208**	0.10	0.37	0.18	0.19	0.06
Lead 212**	0.30	1.24	0.44	0.56	0.27
Bismuth 214*	0.29	0.76	0.48	0.49	0.11
Radium 226*	0.45	1.90	0.90	0.89	0.35
Actinium 228**	0.33	1.05	0.57	0.63	0.20
Thorium 232***	0.55	2.36	1.42	1.41	0.41
Uranium 234***	0.64	1.76	1.04	1.05	0.28
Uranium 235***	0.03	0.08	0.05	0.05	0.01
Uranium 238***	0.62	1.71	1.01	1.02	0.27

Source: Mikol (1988) and Davis et al. (1989)****

Near F and H Areas (n=8)

	Minimum pCi/g	Maximum pCi/g	Median pCi/g	Mean pCi/g	S.D. pCi/g
Strontium 90	0.01	0.31	0.02	0.07	0.11
Cesium 137	0.39	1.48	0.90	0.79	0.39
Plutonium 238	0.013	0.15	0.16	0.047	0.004
Plutonium 239	0.005	0.15	0.08	0.075	0.005

Plant Boundary (n=4)

	Minimum pCi/g	Maximum pCi/g	Median pCi/g	Mean pCi/g	S.D. pCi/g
Strontium 90	-0.03	0.03	0.007	0.005	0.023
Cesium 137	0.58	0.81	0.75	0.69	0.10
Plutonium 238	0.003	0.014	0.004	0.006	0.005
Plutonium 239	0.003	0.020	0.016	0.016	0.003

100 Mile Radius (n=2)

	Minimum pCi/g	Maximum pCi/g	Median pCi/g	Mean pCi/g	S.D. pCi/g
Strontium 90	n.a.	n.a.	n.a.	.013	0.032
Cesium 137	n.a.	n.a.	n.a.	0.36	0.27
Plutonium 238	n.a.	n.a.	n.a.	0.002	0.001
Plutonium 239	n.a.	n.a.	n.a.	0.011	0.007

* Daughter of Uranium

** Daughter of Thorium

*** Values calculated from raw neutron activation data in Pickett and Fay (1982) assuming natural ratios of isotopes

**** Average of raw data from each location for 1987 and 1988 were used to develop summary information

Table 6.36
Background Soil Study
Regional, National, Global

Element	Location	No. Samples	Arithmetic Mean(ppm)	Range(ppm)	Geometric Mean(ppm)	Geometric Deviation	Source
Al	SRS	31	8,239	2,430-26,210			Pickett (1985)
Al	SRS	8	1,700	700-2,200			Holod et al. (1982)
Al	Southeast	6	25,000	900-46,000		2.41	Conner & Shacklette (1975)
Al	National	791	66,000	700->100,000	45,000		Shacklette et al. (1971)
Al	National	1247	72,000	700->100,000	47,000	2.48	Shacklette & Boerngen (1984)
Al	Global		71,000	10,000-300,000			Lindsay (1979)
Al	Global		71,300				Vinogradov (1959)
Sb	National	354	.66	<1-8.8	0.48	2.27	Shacklette & Boerngen (1984)
Sb	Global		2				Rose et al. (1979)
As	SRS	3	2.7	2.6-2.8			Pickett (1985)
As	Southeast	1	5.4	-			Conner & Shacklette (1975)
As	National	1257	7.2	<0.1-97	5.2	2.23	Shacklette & Boerngen (1984)
As	Global		5	1-50			Lindsay (1979)
As	Global		5				Vinogradov (1959)
As	Global		7.5(M)				Rose et al. (1979)
Ba	SRS	3	10.4	9.7-12.2			Pickett (1985)
Ba	Southeast	6	225	63-350			Conner & Shacklette (1975)
Ba	National	863	554	15-5000	430	2.06	Shacklette et al. (1971)
Ba	National	1319	580	10-5000	440	2.14	Shacklette & Boerngen (1984)
Ba	Global		430	100-3000			Lindsay (1979)
Ba	Global		500				Vinogradov (1959)
Ba	Global		300(M)				Rose et al. (1979)
Be	National	847	1	<1-7	0.6	2.49	Shacklette et al. (1971)
Be	National	1303	.92	<1-15	0.63	2.38	Shacklette & Boerngen (1984)
Be	Global		6	.1-40			Lindsay (1979)
Be	Global		6				Vinogradov (1959)
Be	Global		0.5-4				Rose et al. (1979)

Table 6.36 (Continued)
Background Soil Study
Regional, National, Global

Element	Location	No. Samples	Arithmetic Mean(ppm)	Range(ppm)	Geometric Mean(ppm)	Geometric Deviation	Source
Cd	SRS	31	<1.0	<1.0-<1.0			Pickett (1985)
Cd	Southeast	1	<1.0				Conner & Shacklette (1975)
Cd	West U.S.	742	0.33	0.2-0.49			Hutchinson & Meema (1987)
Cd	Central U.S.	957	0.37	0.2-0.94			Hutchinson & Meema (1987)
Cd	Northeast	293	0.17	0.08-0.21			Hutchinson & Meema (1987)
Cd	South	1230	0.15	0.03-0.44			Hutchinson & Meema (1987)
Cd	Global		0.06	0.01-0.70			Lindsay (1979)
Cr	SRS	31	26.7	11.3-54.9			Pickett (1985)
Cr	Southeast	6	38	11-60			Conner & Shacklette (1975)
Cr	National	863	53	1-1500	37	2.32	Shacklette et al. (1971)
Cr	National	1319	54	1-2000	37	2.37	Shacklette & Boerngen (1984)
Cr	Global		100	1-1000			Lindsay (1979)
Cr	Global		200				Vinogradov (1959)
Cr	Global		6.3(M)				Rose et al. (1979)
Cu	SRS	31	<2.0	<2.0-<2.0			Pickett (1985)
Cu	SRS	8	1.2	0.9-1.9			Hollod et al. (1982)
Cu	Southeast	6	18	9-36			Conner & Shacklette (1975)
Cu	National	855	25	<1-300	18	2.28	Shacklette et al. (1971)
Cu	National	1311	25	<1-700	17	2.44	Shacklette & Boerngen (1984)
Cu	Global		30	2-100			Lindsay (1979)
Cu	Global		20				Vinogradov (1959)
Cu	Global		15(M)				Rose et al. (1979)
Fe	SRS	31	22,250	5015-43,685			Pickett (1985)
Fe	SRS	8	11,000	1500-17,500			Hollod et al. (1982)
Fe	Southeast	5	15,000	500-21,000			Conner & Shacklette (1975)
Fe	National	861	25,000	100->100,000	18,000	2.30	Shacklette et al. (1971)
Fe	National	1317	26,000	100->100,000	18,000	2.38	Shacklette & Boerngen (1984)
Fe	Global		38,000	7000-550,000			Lindsay (1979)
Fe	Global		38,000				Vinogradov (1959)
Fe	Global		21,000				Rose et al. (1979)

Table 6.36 (Continued)
Background Soil Study
Regional, National, Global

Element	Location	No. Samples	Arithmetic Mean(ppm)	Range(ppm)	Geometric Mean(ppm)	Geometric Deviation	Source
Pb	SRS	31	*3.21	<2-7.2			Pickett (1985)
Pb	SRS	8	3.4	1.2-5.3			Hollod et al. (1982)
Pb	Southeast	6	13	2.8-26			Conner & Shacklette (1975)
Pb	National	863	20	<10-700	16	1.96	Shacklette et al. (1971)
Pb	National	1319	19	<10-700	16	1.86	Shacklette & Boerngen (1984)
Pb	Global		10	2-200			Lindsay (1979)
Pb	Global		10				Vinogradov (1959)
Pb	Global		17(M)				Rose et al. (1979)
Li	National	1258	24	<5-140	20	1.85	Shacklette & Boerngen (1984)
Li	Global		20	5-200			Lindsay (1979)
Li	Global		30				Vinogradov (1959)
Li	Global		6.2(M)				Rose et al. (1979)
Mg	SRS	31	70.2	28-167			Pickett (1985)
Mg	Southeast	6	160	25-250			Conner & Shacklette (1975)
Mg	National	850	9200	50-100,000	4700	3.19	Shacklette et al. (1971)
Mg	National	1306	9000	50->100,000	4400	3.28	Shacklette & Boerngen (1984)
Mg	Global		5000	600-6,000			Lindsay (1979)
Mg	Global		6,300				Vinogradov (1959)
Mn	SRS	31	38.7	8.0-249			Pickett (1985)
Mn	Southeast	4	250	100-410			Conner & Shacklette (1975)
Mn	National	861	560	<1-7,000	340	2.7	Shacklette et al. (1971)
Mn	National	1317	550	<2-7,000	330	2.77	Shacklette & Boerngen (1984)
Mn	Global		600	20-3,000			Lindsay (1979)
Mn	Global		850				Vinogradov (1959)
Mn	Global		320(M)				Rose et al. (1979)
Hg	SRS	28	*0.201	<0.2-0.21			Pickett (1985)
Hg	Southeast	1	0.1				Conner & Shacklette (1975)
Hg	National	1267	0.09	<0.01-4.6	0.058	2.52	Shacklette & Boerngen (1984)
Hg	Global		0.03	0.01-0.3			Lindsay (1979)
Hg	Global		0.056(M)				Rose et al. (1979)

Table 6.36 (Continued)
Background Soil Study
Regional, National, Global

Element	Location	No. Samples	Arithmetic Mean(ppm)	Range(ppm)	Geometric Mean(ppm)	Geometric Deviation	Source
Ni	SRS		*2.12	<2.0-4.0			Pickett (1985)
Ni	SRS		0.65	0.2-1.2			Hollod et al. (1982)
Ni	Southeast	6	10	2.8-18			Conner & Shacklette (1975)
Ni	National	862	20	<5-700	14	2.26	Shacklette et al. (1971)
Ni	National	1318	19	<5-700	13	2.31	Shacklette & Boerngen (1984)
Ni	Global		40	5-500			Lindsay (1979)
Ni	Global		40				Vinogradov (1959)
Ni	Global		17(M)				Rose et al. (1979)
K	SRS	32	61.4	40-134			Pickett (1985)
K	SRS	8	20	12-26			Hollod et al. (1982)
K	Southeast	6	10,000	800-12,000			Conner & Shacklette (1975)
K	National	861	23,000	50-70,000	12000	2.71	Shacklette et al. (1971)
K	National	1314	15,000	50-63,000	15000	.79	Shacklette & Boerngen (1984)
K	Global		8,300	400-30,000			Lindsay (1979)
K	Global		13,600				Vinogradov (1959)
K	Global		11,000(M)				Rose et al. (1979)
Ag	SRS	2	<1.0	<1.0-<1.0			Pickett (1985)
Ag	Southeast	1	<0.5				Conner & Shacklette (1975)
Ag	Global		0.05	0.01-5			Lindsay (1979)
Se	National	1267	.39	<0.1-4.3	.26	2.46	Shacklette & Boerngen (1984)
Se	Global		0.3	0.1-2			Lindsay (1979)
Se	Global		.001				Vinogradov (1959)
Se	Global		.31(M)				Rose et al. (1979)
Na	SRS	31	79	70-124			Pickett (1985)
Na	SRS	8	70	30-120			Hollod et al. (1982)
Na	Southeast		*220	<200-2500			Conner & Shacklette (1975)
Na	National	788	12,000	<500-100,000	4000	4.11	Shacklette et al. (1971)
Na	National	1193	12,000	<500-100,000	5900	3.27	Shacklette & Boerngen (1984)
Na	Global		6300	750-7,500			Lindsay (1979)
Na	Global		6300				Vinogradov (1959)

Table 6.36 (Continued)
Background Soil Study
Regional, National, Global

Element	Location	No. Samples	Arithmetic Mean (ppm)	Range (ppm)	Geometric Mean (ppm)	Geometric Deviation	Source
Sr	National	862	240	<5-3000	120	3.39	Shacklette et al. (1971)
Sr	National	1318	240	<5-3000	120	3.3	Shacklette & Boerngen (1984)
Sr	Global		200	50-1000			Lindsay (1979)
Sr	Global		300				Vinogradov (1959)
Sr	Global		67(M)				Rose et al. (1979)
U	SRS	31	<10	<10-<10			Pickett (1985)
U	SRS	8	<0.2	<0.2-<0.2			Hollod et al. (1982)
U	National	354	2.7	0.29-11	2.3	1.73	Shacklette & Boerngen (1984)
U	Global		1.0				Rose et al. (1979)
V	National	863	76	<7-500	56	2.16	Shacklette et al. (1971)
V	National	1319	80	<7-500	58	2.25	Shacklette & Boerngen (1984)
V	Global		100	20-500			Lindsay (1979)
V	Global		100				Vinogradov (1959)
V	Global		57(M)				Rose et al. (1979)
Zn	SRS	31	*2.41	<1.0-6.6			Pickett (1985)
Zn	SRS	8	0.9	0.4-1.7			Hollod et al. (1982)
Zn	Southeast	6	*30	<25-64			Conner & Shacklette (1975)
Zn	National	863	54	<25-2000	44	1.86	Shacklette et al. (1971)
Zn	National	1248	60	<5-2900	48	1.95	Shacklette & Boerngen (1984)
Zn	Global		50				Vinogradov (1959)
Zn	Global		36(M)				Rose et al. (1979)

M - Median

* - Averages calculated using less than detection limits as if they were equal to the detection limit (e.g., <2.0 = 2.0).

7.0 Discussion

7.1 Summary of Data

7.1.1 Metals, Radionuclides and Bulk Geochemistry

In general, metal concentrations increase with depth and in proportion to the clay content of the soil. The upper soil horizons are generally more highly leached, and exhibit lower concentrations, than the lower horizons and the parent material. The concentrations measured in this study were similar to those measured in previous studies of SRS and regional-national-global studies from similar highly weathered environments. The radionuclide data presented in Section 6.2 (Past Studies at SRS) are an important adjunct to the limited radionuclide data contained within this study.

When using these data the reader is reminded that compromises were made to address the wide range of project objectives. For example, to meet regulatory objectives, standard EPA protocols for sample extraction and handling were employed and these protocols for soil samples require dissolution solely by nitric acid. Since the only acid that will readily dissolve silicate material is hydrofluoric acid and generally HF acid is used in conjunction with either perchloric or nitric acid to increase the solubility of potassium and calcium salts (Potts, 1987), EPA sample protocols generally will result in the incomplete dissolution of soil samples. Soils generally are composed at least partially of mineral constituents including accessory minerals such as zircon, monazite, magnetite, etc, that may constitute only a minor percentage of the bulk soil yet may contribute significant concentrations of trace elements. These accessory minerals are particularly resistant to acid attack and would likely constitute part of the insoluble residue. Since standard EPA procedures lead to incomplete dissolution, the resulting ranges in concentrations of major, minor and trace elements will be more variable than total concentrations generated by completely dissolving the soil. It should be recognized that samples prepared by other dissolution protocols may not be directly compared to the results of the SRS Soil Survey. The data for these constituents are summarized across all soil types and layers in Table 6.1.

One objective of the SRS Soils Study was to develop background information to help assess areas of potential release of hazardous constituents from solid waste management units. A list of "hazardous" constituents is defined for this purpose by EPA in 40 CFR part 261. The metals included in this list were measured in the SRS Soil Study, along with a few additional metals. Although the additional metals are not listed as hazardous constituents in 40 CFR 261, elevated levels of these metals may serve as indicators of potential impacts and might form the basis for further investigation based on site specific conditions.

7.1.2 Organics

As noted above, organic compounds were detected in all 17 of the samples tested by metaTRACE. A total of six different compounds were detected in the samples, however, not all of these parameters were detected in all 17 samples. The parameters detected included: bis (2-ethylhexyl) phthalate, acetone, methylene chloride, dieldrin, endosulfan sulfate, and butylbenzyl phthalate. No organic Appendix VIII constituents are known to occur naturally in soil, therefore, this portion of the investigation was intended to assess possible laboratory artifacts.

Of the six compounds detected, four are commonly occurring laboratory artifacts (bis (2-ethylhexyl) phthalate, acetone, methylene chloride, and butylbenzyl phthalate). The remaining two compounds, dieldrin and endosulfan sulfate, may result from usage at (or in the vicinity of SRS), or may be analytical artifacts. The first four compounds listed above are commonly reported as detected in trace level organic analyses. Bis (2-ethylhexyl) phthalate and butylbenzyl phthalate are

commonly used as a plasticizer for polyvinyl and cellulosic resins. Acetone and methylene chloride are used in analytical laboratories for extraction solvents.

Three of the samples tested by metaTRACE for Appendix VIII constituents were split and submitted to Weston Laboratories for Appendix IX analyses. Organic compounds were detected in all three of the samples tested by Weston. A total of three compounds were detected in the three samples, however, not all of these parameters were detected in all samples. The parameters detected included: bis (2-ethylhexyl) phthalate, acetone, and methylene chloride. As noted above, all of these compounds are common laboratory artifacts.

The occurrence of these compounds emphasizes the necessity for critical review and validation of all trace level laboratory data. EPA (EPA, 1988) recognizes the potential bias that is oftentimes introduced as a result of method interferences caused by contaminants in solvents, reagents, glassware, and other sample processing hardware. These interferences often lead to discrete artifacts and/or elevated baselines in gas chromatograms. Certain common laboratory solvents are allowed to carryover into method blank samples at levels up to 5 times the contract required detection limit. In evaluating data usability, EPA uses certain general guidelines for assessing the presence of common laboratory artifacts in samples. If the sample concentration is not greater than ten times the blank level, the presence of that compound in the sample is considered suspect and is reported as not detected.

Comparison of metaTRACE method blank results to the accompanying SRS Soil Study samples shows that the common laboratory artifacts detected in the soil samples were not always detected in the accompanying blank sample. This fact demonstrates an additional bias which is likely to occur with trace level organic analyses that cannot easily be prevented, and may be difficult to resolve in a regulatory sense. Stringent quality control procedures must be followed in the laboratory and in the field to minimize the potential for these and other possible false positive detections.

7.1.3 Mineralogy

The mineralogy of the soils is dominated by quartz. Kaolinite dominates the clay mineral assemblage in all of the samples examined in this study. Iron oxide minerals which give the distinctive red coloration to many of the soils are not reported as they are below the detection limits of x-ray diffraction analysis using copper radiation.

The clay mineral fraction of the soils is usually less than ten percent by weight and is composed of the minerals kaolinite, illite, and vermiculite. The soils can be divided on the basis of clay composition into two distinct groups. The first group is almost entirely kaolinite in composition. The second group is dominated by kaolinite with lesser amounts of hydroxy-interlayered vermiculite present. Illite may or may not be present in minor amounts in both groups along with clay-sized quartz.

Kaolinite dominates the clay mineral assemblage in all of the samples examined in this study. This clay is ubiquitous in Coastal Plain soils in the southeastern U.S. and is one of the most stable phases in the weathering zone. The illite identified in the clay fraction has been called illite because of its 10 Å basal reflection and because it occurs in the clay-sized fraction. The structure of this mineral is degraded and the poor crystallinity is demonstrated by its broad diffraction profile.

Chloritized-vermiculite or hydroxy-interlayered vermiculite is present in some of the samples. This clay does not expand upon glycolation but does partially collapse to the 10 Å structure on heating to 350° C (Figure 7.1). Chloritized-vermiculite can result from the degradation of chlorite, or more likely in the case of samples from SRS, it results from the deposition of hydroxy materials within the interlayered spaces of expansible layer silicates during the soil formation process. The

development of hydroxy interlayered vermiculite is discussed by the Barnhisel (1977). The geographic distribution of hydroxy interlayered minerals is wide but their frequency is greatest in the Ultisols and the Alfisols (the primary soils found at SRS). Distribution of the hydroxy interlayered clays within the solum may be uniform or restricted to one horizon. More frequently, however, hydroxyl-interlayering is greatest in the surface horizon and decreases with depth (i.e., the weathering of layer silicate minerals to hydroxy-interlayered vermiculite is greatest in the upper layers).

Figures 7.2, 7.3, 7.4 and Figure 7.5 show the distribution with depth of kaolinite, illite and vermiculite in the soil horizons for samples from the Lakeland, Orangeburg, Blanton and Fuquay soil series, respectively. In all cases, the percentage of vermiculite in the clay fraction decreases with depth. Kaolinite is the dominant clay mineral in all samples and generally illite is not present or found in small amounts (< 2%). The raw compositional data for percentage of quartz and clay are presented in Table 6.30; sieve data for representative samples are presented in Appendix C.5. Field logs for all samples are included in Appendix B.

7.2 Sampling Method and Laboratory Comparison Studies

7.2.1 Carbon Steel And Stainless Steel Comparison

In the carbon and stainless steel comparison study, a total of 26 comparison samples were taken. The comparison data are presented in Appendix C with the paired samples adjacent to each other for each metal tested. The difference and relative percent difference for the paired samples is also included. The purpose of this comparison is to determine whether any bias is associated with either the carbon or stainless steel sampler. The first step in the analysis was to determine if the sampled populations follow a normal distribution (many of the statistical tests require this). In the carbon and stainless steel comparison, as well as the laboratory comparison study discussed below, the W-Test is used to determine if the sampled populations follow a normal distribution. The residuals, or differences between paired samples, represent sample distribution for this paired test. If the W-Test reflected that the sampled distributions were normal, the Paired Difference T-Test was used to determine if any difference existed between the samplers. If the W-Test reflects that the sampled distribution was not normal, the Wilcoxon Rank Signed Test was used to determine if a difference exists between the samplers.

Of the fourteen metals compared, two metals, silver and mercury, did not have an adequate number of comparisons for statistical purposes due to a large number of less than detection limit values. As presented in Table 6.37, 5 of the remaining 12 metals are described by a normal distribution and the Paired Difference T-Test was used accordingly. Overall, two metals were found to be statistically different between the carbon and stainless steel sampler comparison. At the 90% confidence interval, a statistical cadmium bias is associated with the stainless steel sampler and a Pb bias is associated with the carbon steel sampler. If values are included for the large percentage of censored values for cadmium, the conclusion of cadmium bias might change. In both cases, the absolute values of the average differences are relatively small compared to the overall variability in the population. The small difference statistically determined to be associated with each laboratory is unlikely to impact screening decisions based on the data. If the data were available to compare the two data sets in a manner analogous to the methods for round robin acceptance into a program such as the EPA contract lab program (i.e., qualification of labs generating results that lie in a relatively broad range based on results from many laboratories), the results would almost certainly be qualified all constituents.

7.2.2 Laboratory Comparison

In the metaTRACE and Weston laboratory comparison study, a total of 25 comparison or duplicate samples were tested. The duplicate samples were tested for a number of metals, radiological and agricultural parameters, and organics. The raw data are presented in Appendix C. The difference and relative percent difference of the paired samples is also presented in the Appendix. The data were analyzed exactly as described above. Of the 14 metals compared in this report; arsenic, silver, cadmium, and mercury did not have an adequate number of residuals for statistical purposes due to the number of less than detection values. A summary of the results is presented in Table 6.38. A number of metals were rejected by the Paired Difference T-Test and Wilcoxon Signed Rank Test.

The concentration of the metals chromium, potassium, sodium, nickel, lead, and zinc were found to be statistically different at the 90% confidence interval between the two laboratories. However, when analytical methods are performed on matrices which contain very low concentrations of the tested analyte as is the case in the SRS Soil Study, many natural, experimental, and instrumental interferences may pose problems. In all cases, the absolute values of the average differences are relatively small compared to the overall variability in the population. The small difference statistically determined to be associated with each sampler is unlikely to impact screening decision based on the data. If the data were available to compare the two data sets in a manner analogous to the methods for round robin acceptance into a program such as the EPA contract lab program (i.e., qualification of labs generating results that lie in a relatively broad range based on results from many laboratories), the results would almost certainly be qualified for all constituents. Nonetheless, the possibility of differences resulting from variation in analyzing laboratory should be considered if detailed statistical comparisons are made using the SRS Soil Study.

Figure 7.1 X-ray diffraction pattern of a typical sample of chloritized-vermiculite showing collapse to 10 Å structure on heating to 350°C.

Figure 7.2 Depth profile showing distribution of minerals in the clay fraction of the Blanton Soil Series from four horizons at locations BSS 33 and BSS 45.

Figure 7.3 Depth profile showing the distribution of minerals in the clay fraction of the Fuquay Soil Series from four horizons at locations BSS 42 and BSS 44.

Figure 7.4 Depth profile showing the distribution of minerals in the clay fraction of the Lakeland Soil Series from three horizons at locations BSS 41 and BSS 51.

Figure 7.5 Depth profile showing the distribution of minerals in the clay fraction of the Orangeburg Soil Series from four horizons at locations BSS 34 and BSS 46.

8.0 References

- Barnhisel, R. I., 1977. Chlorites and Hydroxy Interlayered Vermiculite and Smectite, in Minerals in Soil Environments, Soil Science Society of America, Madison, Wisconsin.
- Bear, F. E., 1964. Chemistry of the Soil, Reinhold Publishing Corporation, New York.
- Connor, J. J. and H. T. Shacklette, 1975. Background Geochemistry of Some Rocks, Soils, Plants, and Vegetables in the Conterminous United States, U.S. Geological Survey Professional Paper 574-F, Government Printing Office, Washington, D.C.
- Davis, C. E., and J. C. Corey, 1989, Forest Land Application of Sewage Sludge on the Savannah River Plant, DP-1763, Westinghouse Savannah River Company, Aiken, South Carolina, 29808.
- Davis, H. A., D. K. Martin, and J. L. Todd, 1989, Savannah River Site Environmental Report for 1988, WSRC-RP-89-59-1, Westinghouse Savannah River Company, Aiken, South Carolina, 29808.
- EPA, 1980. Prescribed Procedures for Measurement of Radioactivity in Drinking Water, EPA-600/4-80-32, U.S. Environmental Protection Agency, Cincinnati, OH.
- EPA, 1986. Test Methods for Evaluating Solid Waste, (SW-846), 3rd ed., Vol. II, U.S. Environmental Protection Agency, Office of Solid Waste, Washington, D.C.
- EPA, 1988. Laboratory Data Validation Functional Guidelines For Evaluating Organic Analyses, Contract Laboratory Program, Office of Emergency and Remedial Response, Washington, D.C.
- Fay, W. M., and J. B. Pickett, 1987, Documentation of 1982 Soil Analyses to Determine the Natural Background Radioactivity in SRP Surface Soils, DPST-87-260, E.I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, S.C.
- Hollod, G. J., I. W. Marine, H. W. Bledsoe, Jr., and J. P. Ryan, 1982. Metals and Organics in the Soil Beneath the M-Area Settling Basin, DPST-82-721, E.I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, S.C.
- Hubbard, R. K., C. R. Berdanier, H. F. Perkins, and R. A. Leonard, 1985. Characteristics of Selected Upland Soils of the Georgia Coastal Plain, U.S. Department of Agriculture, Agriculture Research Service ARS-37.
- Hutchinson, T. C. and K. M. Meema, 1987. Lead, Mercury, Cadmium and Arsenic in the Environment, Scope 31, John Wiley & Sons, Inc. New York.
- Lindsay, W. L. 1979. Chemical Equilibria in Soils, John Wiley & Sons, Inc., New York.
- Looney, B. B., C.A. Eddy, M. Ramdeen, J. Pickett, V. Rogers, P. A. Shirley, and M. T. Scott, 1990. Evaluation of Geochemical Properties of Soils and Shallow Sediments at the Savannah River Site, WRSC-RP-90-1032, Westinghouse Savannah River Company, Savannah River Laboratory, Aiken, S.C.

- Mikol, Sue C., L. T. Burckhalter, J. L. Todd, and D. K. Martin, 1988, Savannah River Plant Environmental Report. Annual Report for 1987, E.I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, S.C.
- Nriagu, J. O., 1980a. Cadmium in the Environment, John Wiley & Sons, Inc., New York.
- Nriagu, J. O., 1980b. Nickel in the Environment, John Wiley & Sons, Inc., New York.
- Nriagu, J. O., 1980c. Zinc in the Environment, John Wiley & Sons, Inc., New York.
- Pickett, J. B., 1985 Technical Data Summary. Extended Characterization of the M-Area Settling Basin and Vicinity, DPSTD-85-121, (Rev. 10/85), E.I. du Pont de Nemours and Company, Savannah River Laboratory, Aiken, S.C.
- Potts, P. J., 1987, A Handbook of Silicate Rock Analysis, Blackie and Son, Limited, London.
- Robinson, W. O., 1914. The Inorganic Composition of Some Important American Soils, U.S. Department of Agriculture Professional Paper 122, Government Printing Office, Washington, D.C.
- Robinson, W. O., 1917. Variation in the Chemical Composition of Soils, U.S. Department of Agriculture Professional Paper 551, Government Printing Office, Washington, D.C.
- Rose, A. W., H. E. Hawkes, and J. S. Webb, 1979, Geochemistry in Mineral Exploration, Second Edition, London Academic Press, London.
- Shacklette, H. T. and J. G. Boerngen, 1984. Element Concentrations in Soils and other Materials of the Conterminous United States, U.S. Geological Survey Professional Paper 1270, United States Government Printing Office, Washington, D.C.
- Shacklette, H. T., J. C. Hamilton, J. G. Boerngen, and J. M. Bowles, 1971 Elemental Composition of Surficial Materials in the U. S., U. S. Geological Survey Professional Paper 574-D, United States Government Printing Office, Washington, D.C.
- Siegel, F. R., 1974. Applied Geochemistry, John Wiley & Sons, New York.
- U.S.D.A., 1989. Soil Survey of the Savannah River Plant. Aiken County Area. South Carolina, United States Department of Agriculture, Soil Conservation Service, Aiken, South Carolina.
- U.S.D.A., 1986, Designations for Master Horizons and Layers in Soils, Agency for International Development, Department of Agronomy, Cornell University.
- U.S.D.A., 1981, Soil Survey Manual, United States Department of Agriculture Handbook, Government Printing Office, Washington, D.C.
- Vinogradov, A. P., 1959, The Geochemistry of Rare and Dispersed Chemical Elements in Soils, Second Edition, Consultants Bureau Enterprises, New York.
- Waldron, H. A., 1980. Metals in the Environment, Academic Press, New York.

**GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND
SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE**

Appendix A

Background Soil Study Quality Control and Sampling and Analysis Plan

QUALITY CONTROL
AND SAMPLING AND ANALYSIS PLAN

SAVANNAH RIVER PLANT
RFI BACKGROUND SOILS STUDY

PREPARED FOR:

E.I. DU PONT DE NEMOURS & COMPANY
SAVANNAH RIVER PLANT
AIKEN, SOUTH CAROLINA

PREPARED BY:

SIRRIE ENVIRONMENTAL CONSULTANTS, INC.
GREENVILLE, SOUTH CAROLINA

SEC JOB NO. G-8163

AUGUST 18, 1988

TABLE OF CONTENTS

	<u>Page</u>
1.0 INTRODUCTION	1-1
2.0 PROJECT DESCRIPTION	2-1
2.1 General Project Description	2-1
2.2 Site Description	2-1
2.3 Previous Investigations	2-2
2.4 Hazard Assessment	2-2
3.0 PROJECT ORGANIZATION	3-1
4.0 AUGER DRILLING	4-1
4.1 Introduction	4-1
4.2 Soil Drilling Procedures	4-1
4.3 Backfilling and Disposal of Excess Cuttings	4-2
4.4 Drilling Equipment Decontamination	4-2
5.0 SAMPLING AND CHAIN OF CUSTODY PROCEDURES	5-1
5.1 Introduction	5-1
5.2 Sample Site Selection	5-1
5.3 Soil Sample Locations and Descriptions	5-1
5.4 Soil Sampling Procedure	5-5
5.4.1 Split Spoon Samples	5-6
5.4.2 Grab Samples	5-7
5.5 Field Quality Control	5-7
5.6 Field Cleaning Procedures	5-8
5.7 Field Quality Control Samples	5-8
5.7.1 Duplicate Samples	5-8
5.8 Sample Packaging	5-8
5.9 Sample Custody	5-10
5.9.1 Chain of Custody Record Form	5-11
5.9.2 Field Collection and Shipment	5-13
5.9.3 Sample Disposal	5-14
6.0 ANALYTICAL METHODS AND PROCEDURES	6-1
7.0 PROJECT DOCUMENTATION	7-1
7.1 Project Record Book	7-1
7.2 Communication Report	7-1
7.3 Field Geologic Log	7-1
7.4 Test Boring Report	7-1
8.0 PROJECT ACCOUNTING	8-1

1.0 INTRODUCTION

This document is intended to present the Quality Control Plan (QCP) and Sampling and Analysis Plan (SAP) for the Savannah River Plant RFI Background Soils Study. The QCP describes the methods and approaches for providing quality control of field activities performed by Sirrine Environmental Consultants, Inc., (SEC) and the drilling and analytical subcontractors involved with this project. In addition, the SAP includes the procedures to be followed when conducting sampling and analytical activities during this project.

This investigation is being conducted under Subcontract AX-715304, Task Order 24, for E.I. du Pont de Nemours & Company (du Pont).

2.0 PROJECT DESCRIPTION

2.1 General Project Description

This plan describes the procedures which will govern all investigative sampling and chemical analyses activities to be performed by SEC as part of the RCRA Facility Investigation (RFI) Background Soils Study at the Savannah River Plant (SRP). The principal objective of this study is to determine representative background concentrations for various chemical constituents in soils at the SRP. These data will be compared with data obtained from Solid Waste Management Unit (SWMU) sites at the SRP which may have received hazardous materials to determine what, if any, clean up actions are necessary. Approximately 65 of these sites are currently being investigated in accordance with EPA RFI guidelines. Also, SEC will be performing a comparison of stainless steel and carbon steel split spoon samplers during this study. Samples will be collected using each type of split spoon from identical soil intervals at adjacent boring locations.

2.2 Site Description

The SRP is a U.S. Department of Energy facility located near Aiken, South Carolina, along the Savannah River. The plant is a major DOE installation engaged in the production of defense nuclear materials. The production of these materials and the operation, fabrication, separation, and support facilities result in the generation of hazardous, low-level radioactive, and mixed wastes (radioactive and hazardous). Certain waste materials generated by the SRP are regulated by RCRA, and require post-closure or operating permits. The RFI program requires that other waste sites (SWMUs) be investigated to determine if releases of hazardous constituents have occurred. Approximately 65 SWMU sites have been identified for investigation at the SRP. A map of the entire SRP is shown on Figure 1.

SIRRINE
ENVIRONMENTAL
CONSULTANTS

Greenville, South Carolina

FIGURE 1

SAVANNAH RIVER PLANT
SITE MAP

F1385

8/1/88

2.3 Previous Investigations

- o Soil Survey of Aiken County Area, South Carolina, United States Department of Agriculture, Soil Conservation Service.

This study describes the various soil series found in Aiken County, South Carolina. Although the Savannah River Plant is excluded from this report, many of the soil series discussed in this publication are found on SRP. Of the six soil groups to be studied in the Background Soils Study, only the Blanton is not mentioned in this report.

- o Floodplain Sediment Study, part of the 1985 Comprehensive Cooling Water Study, Savannah River Plant.

This report describes the analytical methods and results used to characterize the soil types from floodplains at SRP. Soil cores taken from floodplains on the SRP facility were analyzed for certain trace elements and radionuclides.

- o Soil Survey of the Savannah River Plant, Aiken County Area, South Carolina, Vergil Rogers, United States Department of Agriculture, Soil Conservation Service, Vergil Rogers, in press.

This study describes the various soil series found on the Savannah River Plant.

2.4 Hazard Assessment

No hazardous constituents are expected to be encountered during the Background Soils Study. The purpose of this study is to establish background levels for certain analytical parameters found in the various Savannah River Plant soil types. The sites to be studied during this investigation are located in areas known to be nonhazardous to insure that "true" background information is obtained.

3.0 PROJECT ORGANIZATION

The organization of the SRP RFI Background Soils Study is shown on Figure 2. Key project personnel include the SRP Project Manager, Brian Looney, and the SEC Project Manager, Pat Shirley. Other key project personnel and their telephone numbers are listed on Table 1. The SEC Project Manager will report directly to the SRP Project Manager. SEC will be responsible for coordination with all subcontractors involved with this project. The major subcontractors selected for this project consist of:

- o metaTRACE Laboratories, the primary analytical laboratory,
- o Weston Analytics, the Quality Assurance Laboratory, and
- o Monitor Testing Corporation, the drilling contractor.

Coordination with the drilling subcontractor will be conducted with the assistance of Health Protection (HP). SEC will maintain daily records for drilling pay items. These records will be submitted to HP on a routine frequency for accounting purposes. SEC will be responsible for direct coordination of the analytical laboratories, including scheduling, accounting, and data validation.

Figure 2

PROJECT ORGANIZATION CHART
SRP RFI Background Soils Study

TABLE 1

SIRRINE ENVIRONMENTAL CONSULTANTS, INC.
PERSONNEL CONTACTS
RFI BACKGROUND SOILS STUDY
Letter Subcontract AX-715304, Task Order 24
SEC Job No. G-8163

Ed Zillioux, H&S Director	234-3061 232-3891	Office Home
Mark McCoy, H&S Coordinator	234-3595	Office
Pat Shirley, Project Manager	234-3068 297-1711	Office Home
SEC Aiken Apartment	649-0396	
SEC Well Building Office	557-6745	

E.I. du Pont de Nemours & Company
 Savannah River Plant
 TCI Area, Building 772-7G
 Aiken, South Carolina 29808

SEC M-Area Office	725-2350	
-------------------	----------	--

SRP CONTACTS

Brian Looney, Contract Administrator	725-5189	Office
Bonnie Ferguson (Brian Looney's Secretary at 773-42A)	725-5178	Office
Bob Hunter Norm Bryan	557-6648	Office
Janelle Janssen	725-2456	Office
Ed Campbell	725-2037	Office

LABORATORY CONTACTS

metaTRACE, Inc. 13715 Rider Trail North Earth City, Missouri 63045	SRM 7812 (314) 298-8566
Patrick Kelly, Project Manager Rich Mannz, Assistant Project Manager	
Weston Analytics 208 Welsh Pool Road Lionville, Pennsylvania 19353	SRM 7811

4.0 AUGER DRILLING

4.1 Introduction

All drilling will be performed with a Mobile B-24 truck-mounted auger drilling rig. An experienced (SEC) geologist will continuously observe all drilling operations. No grease or oil shall be used on drill pipe joints.

4.2 Soil Drilling Procedures

Soil drilling will be accomplished using 3 1/4 inch I.D. (6 7/8 inch O.D.) hollow-stem augers.

All soil samples will be taken using split spoons which are either 18 or 24 inches long and either 1 3/8 inch I.D. (2 inch O.D.) OR 2 7/8 inch I.D. (3 inch O.D.). The split spoons will be manufactured of carbon or stainless steel. The samples will be obtained by driving the split-spoon sampler using a 140-pound hammer, free-falling for 30 inches. Representative portions of each sample will be stored in labeled glass jars until needed for testing or the contract is complete.

Soil samples for lithologic description shall be taken continuously from the land surface to the completion depth of 20 feet in each boring. All soil samples will be identified in the field by an SEC geologist using visual/manual techniques described in ASTM D-2487 and D-2488. The soils will be classified in accordance with the Unified Soils Classification System and a log of each boring will be produced. In addition, all samples will also be classified according to the SRP Field Classification System (RFI Program Plan, Appendix I).

Personnel involved in removing and preserving soil samples for chemical analysis will wear surgical inner gloves with nitrile outer gloves which will be washed with soapy water and rinsed with distilled or

deionized water immediately prior to handling each sample.

The split-spoon sampler and subsampling instruments will be decontaminated before each sample is taken as described in Section 4.4.

4.3 Backfilling and Disposal of Excess Cuttings

Cuttings from all drilling operations will be backfilled in the original borehole.

4.4 Drilling Equipment Decontamination

The drill rig and equipment will be cleaned to remove excess grease, oils, or caked-on soils from previous work, upon arrival at the site. Equipment which leaks fuel, coolant, crankcase oil, transmission fluid, hydraulic fluid or lubricants will be removed from site and repaired prior to use. The work area of the drill rig, all downhole tools, split-spoon sampler and subsampling instruments will be decontaminated before each sample is taken in accordance with the following procedures:

1. Clean with tap water and phosphate-free laboratory detergent using a brush if necessary to remove particulate matter and surface films.
2. Rinse thoroughly with tap water.
3. Rinse thoroughly with distilled or deionized water.
4. Rinse two times with pesticide grade isopropanol solvent and allow to air dry for as long as possible.
5. Rinse thoroughly with distilled or deionized water and allow to air dry for as long as possible.

6. Wrap with aluminum foil, if appropriate, to prevent contamination if equipment is going to be stored or transported.

An alternate decontamination procedure will consist of steam cleaning instead of Steps 1 through 3 above. Decontamination will continue with Steps 4 through 6. Personnel involved with the decontamination procedures will wear surgical inner gloves with nitrile outer gloves which will be washed with soapy water and rinsed with distilled or deionized water immediately prior to handling any equipment used in sampling.

After steam cleaning, tools and equipment shall be stored on plastic sheeting to avoid contamination.

5.0 SAMPLING AND CHAIN OF CUSTODY PROCEDURES

5.1 Introduction

The following sections present requirements for numbers, general locations, and analyses of samples to be collected. These requirements are summarized in Tables 2, 3, 4, 5, 6, 7, and 8.

Sampling procedures to be used are outlined in the respective section below. Sample containers and preservation techniques are summarized in Table 9. Since the samples to be collected are in areas known to be nonhazardous, the samples collected during this investigation will be considered low-level environmental samples.

5.2 Sample Site Selection

The rationale for the selection of sampling sites is to determine representative background concentrations for various chemical constituents in soils at the SRP. The sites are to be located in areas known to be nonhazardous to insure that "true" background information is obtained. The sites were predetermined during a site walkover.

5.3 Soil Sample Locations and Descriptions

Approximately 48 boreholes will be augered to a depth of 20 feet at predetermined locations throughout the plant site. Twenty-nine soil series types have been identified at the Savannah River Plant. Many of these series were characterized as part of the Comprehensive Cooling Water/Floodplain Study. Therefore, the soil series which occur predominantly in floodplain areas have been eliminated as candidates for further investigation. The results contained in the existing floodplain study report will, however, be incorporated into the data base for the background soils study. Table 10 lists the soil series name, location, and coordinates for the samples collected during the floodplain study. Exclusion of the floodplain soil series reduced the

TABLE 9

SRP RFI Background Soils Study
Soil Sample, Containers, and Preservation

PARAMETER	CONTAINER	SAMPLE PRESERVATION
Metals and inorganic ions	1-250 ml glass	Ice to 4° C
Soil pH		
Total Organic Carbon		
Total Organic Halogens		
Cation Exchange Capacity	1-250 ml glass	Ice to 4° C
Exchangeable Acidity		
Exchangeable Base Metals		
Gross Alpha		
Gross Beta	1-250 ml glass	Ice to 4° C
Uranium		
Strontium		
Particle Size Distribution	polyethylene bag	none
Appendix VIII		
	1-250 ml glass	Ice to 4° C
	1-100 ml glass	Ice to 4° C
	no headspace	
X-Ray Diffraction	polyethylene bag	none

* All containers will have Teflon-lined lids, and both clear and amber glass containers may be used. Several parameters will be combined into common containers.

number of soil series from 29 to 15. The remaining soil series have been categorized by taxonomic class into six archetypal soil groups which cover approximately 75 percent of the SRP. Ten locations for each of the six soil groups have been selected by du Pont.

The soil series groups and the 10 possible sample locations for each group are listed on Table 11. It is important to note that only one soil series (type) will be tested for each of the six archetypal soil groups. The remaining series within a particular group closely resemble the soil series tested.

A description of each of the six groups is provided below.

Group One

Blanton sand is the predominant soil type on SRP. It covers 21 percent of the plant area. Using Blanton as the central series in group one, the remaining soils in group one had the same or similar properties of Blanton.

The taxonomic name for Blanton indicates that the soil is almost entirely silica or other weather resistant minerals. Also, the sandy layer is greater than 1 meter thick, the soil is very old and well developed, and it is moist with a very low base saturation.

Troup, Albany, Wagram, and Lucy were placed into group one. Albany and Troup are nearly a perfect match for Blanton. The only difference appears to be Blanton. Lucy was placed in this group because generally large areas of Troup are very intermixed with Lucy. Also, Lucy shares most of the same characteristics except that it is arenic rather than grossarenic. This means the sandy layer is not quite as thick. Wagram shares the same properties as Lucy; therefore, it was also included in group one.

Table 11 Groupings and Possible Soil Core Locations

Soil Groupings		
Group number	Soil series	Percent of plant site
1	Blanton	21
1	Troup	10.3
1	Albany	0.5
1	Wagram	2.9
1	Lucy	1.2
	Total for group 1 soils	35.9
2	Orangeburg	3.4
2	Norfolk	1.6
	Total for group 2 soils	5.0
3	Fuquay	11.3
3	Dothan	7.9
	Total for group 4 soils	19.2
4	Vaocluse-Ailey	6.9
4	Ailey	1.2
	Total for group 4 soils	8.1
5	L-keland	4.3
6	Odorhents (Urban)	3.9
	Total for all 6 groups	76.4

Group 1 Site Locations

Location	Map number
1) North of Road 2-1	6
2) Road 8	8
3) Junction Road A and Cook Road	9
4) Junction of Roads 2-1 and 8-4	12
5) North of Road G	17
6) Junction of 115KV Trans Line and Super Control Relay Cable	21
7) South Junction of Road C and Road 9	28
8) Seaboard Coastline South of M Line	30
9) Between Risher Pond Road and Seaboard Coastline	32
10) East of Junction of 115KV Trans Line and Seaboard Coastline	34

Table 11 Cont.

Group 2 Site Locations

<u>Locations</u>	<u>Map Number</u>
1) North of Road 2-1	6
2) Road A South of Seaboard Coastline	38
3) M Line	9
4) Road 2-1	12
5) Northwest of D Area	26
6) Cato Road	21
7) Road B West of Pen Branch	28
8) SRP Boundary 1/4 mile from Lower Three Runs Creek	30
9) Road A 1/2 mile east of Pen Branch	32
10) SRP Boundary 1/4 mile from Lower Three Runs	35

Group 3 Site Locations

<u>Locations</u>	<u>Map Numbers</u>
1) North of Road 2-1	6
2) Near Road 8	8
3) Cook Road just past 115KV Trans Line	9
4) Monroe Owens Road North of R Area	17
5) Junction of Roads 5 and 3	21
6) K line North of 115KV Trans Line	28
7) Seaboard Coastline	30
8) Seaboard Coastline between Meyers Branch and 115KV Trans Line	34
9) Road 2-1	12
10) Road A Northwest of Pen Branch	32

Table 11 Cont.

Group 4 Site Locations

<u>Locations</u>	<u>Map Numbers</u>
1) North of Road 2-1 between 2-1.1 and Upper Three Runs	6
2) CSX South of Seaboard Coastline	38
3) Unnamed Road between M Line and Road D	9
4) Underground Burial Cable between County Line and Mill Creek	12
5) East Bank of Pond C	17
6) Road A-6 West of Road A-6.1 North of C Area	21
7) Road C North of Road 7	28
8) Seaboard Coastline South of M Line	30
9) Road A just East of Pen Branch	32
10) Seaboard Coastline North of 115KV Trans Line	34

Group 5 Site Locations

<u>Locations</u>	<u>Map Numbers</u>
1) Road F-1 North of Road 2-1	6
2) West of Road 8	8
3) Road B-6 near SRP boundary	35
4) East of Road 8-1 at very top of map	12
5) Road 3, 1/3 of the way between Par Pond and R Area	17
6) Road 3 West of Four Mile Creek	21
7) Near SRP Boundary North of Road A	1
8) B-6.4 South of Lower Three Runs	30
9) North of unnamed Road extending from Par Pond near SRP Boundary	24
10) East of C-4 South of Upper Three Runs	15

Table 11 Cont.

Group 6 Site Locations

<u>Locations</u>	<u>Map Numbers</u>
1) 700 Area	9
2) South of Road 2-1 just inside of Aiken County	12
3) R Area	17
4) C Area	21
5) L Area	28
6) Between Road B and Par Dam	30
7) Seaboard Coastline between 115 KV Trans Line and Meyers Branch	34
8) H Area	16
9) D Area	26
10) CS Area	22

Group Two

The central series in group two is Orangeburg. This soil type covers 3.4 percent of SRP. By using the taxonomic name for Orangeburg it was determined that this soil type is at least 15 percent sand and approximately 18 to 34 percent clay. Like Blanton, it is almost entirely silica or other weather resistant minerals. This series is a well developed mineral soil with an alluvial horizon of silicate clay. Orangeburg has a low base saturation and is moist.

By using the taxonomic name, Norfolk was placed into group two. Norfolk and Orangeburg seem to match perfectly, in that they share the same taxonomic name. The group two series covers about 5 percent of the plant.

Group Three

The second most common soil type on SRP is Fuquay. This series encompasses roughly 11.3 percent of the plant, therefore, it was made the central series of group three.

The taxonomic name for Fuquay indicates that it is less than 35 percent clay. It is almost entirely silica or other weather resistant minerals. The sandy layer is between 20 and 40 inches deep. Fuquay contains more than 5 percent plinthite, an iron-rich material that hardens irreversibly upon exposure. The series is very well formed and has a low base saturation.

The only other soil series which matched Fuquay was Dothan. Dothan and Fuquay differ only in particle size and depth of the sandy layer. Dothan has finer particles while Fuquay has a deeper sandy layer. Most importantly, both soils are plinthic. These are the only two plinthic soils on SRP. Group three soils cover 19.2 percent of SRP.

Group Four

The central series in group four is Vaucluse. This series includes the Vaucluse-Ailey complex. This complete series covers 6.9 percent of SRP. The taxonomic name for Vaucluse indicated that the soil was very well developed with a simple set of horizons. It is at least 15 percent sand and approximately 18 to 34 percent clay. Over 90 percent of the soil is either silica minerals or other weather resistant minerals.

Ailey also fits into this group. The differences between Ailey and Vaucluse are the particle sizes and the depth of the sandy layer. Ailey has finer particles and a deeper sandy layer than Vaucluse. Vaucluse and Ailey are very often intermixed, and it is very hard to find an area that is predominantly one or the other. Because of this fact, Vaucluse and Ailey were grouped together.

Group Five

Lakeland sand is group five. It is the only quartzipsamment soil and thus had to be grouped alone. The taxonomic name for Lakeland tells us the soil is very sandy and the sand grains are mostly coated. It is a recently formed mineral soil with weak or no pedogenic horizon. Lakeland covers 4.3 percent of SRP.

Group Six

The sixth and final group is the most difficult to define. This group consists of the Udorthents. Udorthents are areas that are not predominantly one soil type. Udorthent areas are generally the result of construction work and pit filling. There are no uniform characteristics for this soil type. Within a few feet, the properties of Udorthent soil can change dramatically. Thus, wide variability is expected within the Udorthents classification. To obtain our background results, we will test eight different Udorthent sites plus

use the results from the analysis of the other soil types. Udorthents cover 3.9 percent of SRP.

Du Pont personnel will flag each sampling location in the presence of SEC, confirm the predetermined soil group and series, and label as such. The SEC Field Manager will supervise the sampling activities at each site in accordance with the sampling protocol described herein.

5.4 Soil Sampling Procedure

Soil samples for nonvolatile organic analysis will be collected by obtaining a sample from the target interval. The soil horizon will be confirmed based upon a visual comparison with the written soil series description. The soil sample will be placed in a stainless steel mixing bowl and homogenized using stainless steel utensils. The soil in the mixing bowl will then be divided into imaginary quadrants. One aliquot of sample from each quadrant will be collected using a stainless steel spoon and placed in the sample containers. Following collection of the subsample from each of the four quadrants, the remaining sample will be rehomogenized and the process repeated until all containers are filled. Residual soil from the target interval will be placed in core boxes for storage.

Samples collected for volatile organic compound analysis will be collected in a similar manner. Following confirmation of the proper sample horizon, a sample aliquot will be collected immediately from the mid-point of the target interval. The sample will be placed in the container such that no headspace remains; then it will be sealed, labeled, and placed in a precooled ice chest.

If the upper soil horizon is between 0 and 18 inches in depth, or any fraction thereof, the sample may be collected using a hand trowel, hand auger, or split spoon. The sample location may be extended radially from the sample origin to obtain the necessary volume. Shallow grab samples to be tested for volatile organic compounds will be collected

by excavating soil to the mid-point of the upper horizon. Soil from above the mid-point will be placed in the mixing bowl for homogenization as described above. Soil from immediately below the mid-point will be placed in the sample container for volatile organic compound analysis. The container will be filled such that no headspace remains; then it will be sealed, labeled, and placed in a precooled ice chest.

Decontamination procedures for all downhole tools and subsampling equipment will be conducted as described in Section 4.4.

5.4.1 Split-Spoon Samples. Split-spoon samples will be collected for chemical analyses at all soil boring sites.

Either 18 or 24-inch long, standard 1 3/8 inch I.D. (2 inch O.D.), or 2 7/8 inch I.D. (3 1/2 inch O.D.) stainless steel or carbon steel, split-spoon samplers will be used to collect samples. Each split-spoon sample will be taken according to the following procedure:

1. Decontaminate sampler as specified in Section 4.4.
2. Drive split spoon with a 140-pound hammer falling 30 inches.
3. Sample aliquots will be removed from the split-spoon sampler using a decontaminated stainless steel spatula, scoop, or teaspoon and placed in the appropriate prelabeled containers or mixing bowls.
4. Immediately store samples in precooled ice chest at 4°C.
5. Only stainless steel or glass mixing bowls and utensils will be used for compositing soils samples.
6. If sample volume is insufficient for the required analyses, additional samples will be collected immediately below the desired sample zone or immediately adjacent to the original location and

at the same depth interval.

7. The sample logbook and chain of custody will then be completed.

5.4.2 Grab Samples. The first soil sample at each boring will be considered a grab soil sample.

Equipment to be utilized for collection of near surface soil samples include: stainless steel trowel, stainless steel spoons, and stainless steel hand auger. Procedures for collection of near surface soil samples are as follows:

1. Use stainless steel trowel, stainless steel spoons, or stainless steel hand auger to excavate to 6 inches.
2. Decontaminate sampler as specified in Section 4.4.
3. Collect representative sample using decontaminated sampler.
4. Sample aliquots will be removed from the sampling instrument using a decontaminated stainless steel spatula, scoop, or teaspoon and placed in the appropriate prelabeled containers or stainless steel mixing bowls.
5. Only stainless steel utensils will be used for compositing soil samples.
6. Samples will then be placed into coolers and packed on ice.
7. Complete sample logbook and chain of custody.

5.5 Field Quality Control

A strict quality control program will be maintained by SEC in the field to ensure that sample integrity is maintained during sample collection

and transfer to the laboratory. In addition, all equipment and instruments will be maintained and calibrated to prevent sample bias and ensure that field measurements are accurate. All quality control procedures followed in the field will be documented in the Field Logbook. In addition to these filed procedures, external quality control samples will be collected and analyzed to verify the results.

5.6 Field Cleaning Procedures

All field equipment will be cleaned at the SEC laboratory according to the laboratory procedures prior to travel to the site. Field equipment includes: stainless steel trowel, mixing bowels, spoons, and sounding rod.

Field equipment must be used at multiple sampling locations and will be cleaned according to the Drilling Equipment Decontamination Procedures in Section 4.4.

5.7 Field Quality Control Samples

In order to verify the quality of the sample collection, transportation, and analysis of samples collected during the Background Soils Study, duplicate samples will be collected.

5.7.1 Duplicate Samples. Duplicate samples will be collected on 10 percent of the field samples collected during this investigation. These samples will be collected such that they are representative of the same depth interval. All duplicate samples will be tested by Weston Analytics.

5.8 Sample Packaging

The transportation of environmental samples from the time they are collected to their arrival at metaTRACE Laboratories in Earth City, Missouri, is an integral part of the Background Soils Study. The mode

of travel must be such that the sample is not altered physically, chemically, or biologically. The travel time to the laboratory must not interfere with the sample holding time. The chain of custody must also be maintained during the transportation process.

Samples collected at the site will be immediately placed in the sample cooler. Once the cooler is filled with samples, it is locked and securely positioned in a SEC sampling vehicle or other secure storage facility until the completion of the day's sampling activities. The following protocol will be followed for packaging of samples:

- o Only waterproof metal or equivalent strength plastic ice chests and coolers will be used.
- o Following the completion of the sample label and tag, the sample will be carefully placed into the container in the field. The sample tag will then be attached to the container.
- o The labels will be permanently affixed to each container. All labels will be completed with an indelible pen.
- o Inert cushioning material will be placed in the bottom of the cooler. The sample bottles will be individually wrapped with a bubble-wrap packing material.
- o Additional inert packing material will be placed in the cooler to partially cover the sample bottles. Ice or freeze packs will be placed around, among, and on top of the sample bottles.
- o Each cooler will be filled with additional cushioning materials to prevent movement of samples during shipment.
- o The chain of custody record will be placed in a waterproof plastic bag and taped to the inside lid of the cooler.

- o The lid will be secured with strapping tape at a minimum of two locations. No labels will be covered.
- o The completed shipping label will be attached to the top of the cooler.
- o The weight limit of the shipper will be maintained.

5.9 Sample Custody

An overriding consideration for environmental measurement data is the ability to demonstrate that samples have been obtained from the locations stated and that they have reached the laboratory without alteration. Evidence of collection, shipment, laboratory receipt and laboratory custody until disposal must be documented to accomplish this objective. Documentation is accomplished through a chain of custody records each sample and the individuals responsible for sample collection, shipment, and receipt. A sample is considered in custody if it is:

- o In a person's actual possession
- o In view after being in physical possession
- o Sealed so that no one can tamper with it after having been in physical custody
- o In a secured area, restricted to authorized personnel.

Sample custody will be initiated by SEC field personnel upon collection of samples. Documents similar to those included in this section will be used for recording pertinent information about the types and numbers of samples collected and shipped for analysis. Labels and log information are checked to be sure there is no error in identification.

The samples are then packaged to prevent breakage or leakage, and labeled according to DOT regulations or transported by private company vehicle as laboratory samples. Copies of forms will be maintained on-site; originals will be maintained at MetaTrace Laboratories.

Samples used for analysis will be held for 30 days following report of data before disposal. Archived samples will be stored until the end of the project. Disposal of the samples are the responsibility of the contracted laboratories.

Certain samples are designated to be sent to Weston Analytics for independent confirmation of analytical results. Such samples will contain copies of the chain of custody documentation and be shipped according to DOT regulations.

5.9.1 Chain of Custody Record Form. Figure 3 is the chain of custody form to be used by SEC personnel in collecting and shipping samples. MetaTRACE Laboratories and Weston Laboratories shall not accept samples for analysis without a correctly prepared chain of custody.

The chain of custody form shall be signed by each individual who has the samples in their possession. Preparation of the chain of custody form shall be as follows:

- o The chain of custody record shall be initiated in the field by the person collecting the sample, for every sample. Every sample shall be assigned a unique identification number that is entered on the chain of custody form. Samples can be grouped for shipment and using a single form. The chain of custody form allows for twelve samples. If more than twelve samples are shipped in the same container, more than one chain of custody form is required.
- o The record shall be completed in the field to indicate project, sampling team, etc.

- o If the person collecting the sample does not transport the samples to the laboratory or deliver the sample containers for shipment, the first block for "Relinquished By _____, " "Received By _____" shall be completed in the field.
- o The person transporting the samples to the laboratory or delivering them for shipment shall sign the record form as "Relinquished By _____."
- o If the samples are shipped to the laboratory by commercial carrier, the chain of custody form shall be sealed in a watertight container, placed in the shipping container, and the shipping container sealed prior to being given to the carrier.
- o If the samples are directly transported to the laboratory, the chain of custody shall be kept in possession of the person delivering the samples.
- o For samples shipped by commercial carrier, the waybill shall serve as an extension of the chain of custody record between the final field custodian and receipt in the laboratory.
- o Upon receipt in the laboratory, the Sample Receiving Supervisor shall open the shipping containers, compare the contents with the chain of custody record, insure that document control information is accurate and complete, and sign and date the record. Any discrepancies shall be noted on the chain of custody form.
- o If discrepancies occur, the samples in question shall be segregated from normal sample storage and the field personnel immediately notified.
- o The chain of custody is completed after sample disposal. Note the blocks for this purpose on Figure 3.

FIGURE 3

Chain Of Custody Record

[illegible]

Original Report

- o Chain-of custody records shall be maintained with the records for a specific project, becoming part of the data package.

5.9.2 Field Collection and Shipment. Samples must be placed in containers compatible with the intended analysis and properly preserved. Also, collection of samples must consider the time interval between acquiring the sample and analysis (holding time) so that the sample is representative. Table 9 provides requirements of the analytical parameters of interest to this project with respect to the type of container and preservation methods.

- o Package samples according to section 5.8.
- o Mark the appropriate "SRM No." on a piece of tape and place on the outside of the cooler.
- o Notify John Frazier with Occupational Health Protection (OHP) to have them scan the samples/cooler for radiation. Making it clear to them that the samples are from remote background locations and that we have exerted an effort to avoid waste site areas.
- o Take samples to Lizzie Overstreet with shipping/receiving in Building 713-A by 1 p.m. to have them shipped by Federal Express.

When samples are delivered to SRP Shipping/Receiving SEC will relinquish custody of the samples to SRP.

Shipping containers are to be sealed prior to shipment, whether shipped by direct transport by field personnel or commercial carrier. Samples will not be retained at the site for more than 24 hours following collection.

The final step is to provide information to the laboratory shown in Figure 4. The Request for Analysis form will be completed by the field personnel and included with the chain of custody record. It is

imperative that the Request for Analysis form be provided so that analytical requirements are defined and sample holding times are not exceeded.

5.9.3 Sample Disposal. The chain of custody for the sample is completed as part of sample disposal. The contract laboratories will be responsible for the disposal of any remaining samples after the analyses is complete. The samples are to be taken from non-hazardous sites so no special disposal methods are necessary.

FIGURE 4

(This form must accompany samples -
Do not send under separate cover)

REPORT TO

TELEPHONE NO.

DATE/TIME:

6.0 ANALYTICAL METHODS AND PROCEDURES

Analytical procedures and reference methods to be followed for the background soils study are listed on Table 2. The majority of the analytical procedures follow reference methods specified in EPA document SW-846, entitled "Test Methods for Evaluating Solids Wastes," Third Edition. Reference methods for the agricultural and radiological parameters were taken from other procedure manuals, as specified on the table. Contract required detection limits for metals and inorganic ions are specified on Table 13.

All analyses will be conducted by metaTRACE Laboratories, with two exceptions. Weston Analytics will perform analyses of split samples collected for quality control purposes. X-ray diffraction analysis of samples collected during this project will be performed by Conoco.

TABLE 12

SRP RFI Background Soils Study
ANALYTICAL METHODS

PARAMETER	MATRIX	METHOD	PROCEDURE
Metals, except as follows	Soil	6010 ¹	Inductively Coupled Plasma
Mercury	Soil	7471 ¹	Manual Cold-Vapor
Lead	Soil	7421 ¹	AA, Furnace
Arsenic	Soil	7060 ¹	AA, Furnace
pH	Soil	9045 ¹	Electrometric
Total Organic Carbon	Soil	9060 ¹	Carbonaceous Analyzer
Total Organic Halogens	Soil	9020 ¹	Carbon adsorption
Cation Exchange Capacity	Soil	9080 ¹	Ammonium Acetate
Exchangeable Acidity	Soil	6H2a ²	
Exchangeable Base Metals	Soil	5B1 ²	
Gross Alpha	Soil	3	
Gross Beta	Soil	3	
Uranium	Soil	3	
Strontium	Soil	3	
Particle Size Distribution	Soil	D421, D422 ⁴	
Appendix VIII	Soil	1	
X-Ray Diffraction	Soil	5	

- 1: U.S. EPA, 1986, Test Methods for Evaluating Solid Waste, SW-846.
 2: U.S. Department of Agriculture, 1967, Soil Survey Investigation Report 1, entitled "Soil Survey Lab Methods and Procedures for Collecting Soil Samples."
 3: U.S. EPA documents 520/5-84-006, 600/4-80-032
 4: ASTM, 1984, Annual Book of ASTM Standards, Vol. 4.08.
 5:

TABLE 13

SRP RFI Background Soils Study
Specific Metals and Inorganic Ions Required

METAL	DETECTION LIMIT
Aluminum	10
Arsenic	0.12
Barium	2
Cadmium	1
Chromium	4
Copper	2
Iron	4
Lead	2
Mercury	0.05
Nickel	0.1
Potassium	0.1
Silver	0.1
Sodium	1
Uranium	1
Zinc	1

* Units in $\mu\text{g/l}$

7.0 PROJECT DOCUMENTATION

7.1 Project Record Book

A numbered log book will be kept by SEC personnel throughout the entire project. The information entered in the logbook will consist of daily drilling activities, personnel entering and leaving specific sites, health and safety matters, and conversations with individuals regarding the project. The Project Record Log Book will serve as a single source documenting all project activities.

7.2 Communication Report

An SEC "Communications Report" form will be utilized to document important conversations pertaining to the Background Soils Study. This includes conversations leading to changes in the original Scope of Work, notification to MetaTRACE and Weston Laboratories of sample shipments, and other important conversations. This form is shown on Figure 5.

7.3 Field Geologic Log

The Savannah River Plant "Field Geologic Log" will be completed for each test boring drilled during the Background Soils Study. Soils described on the Field Geologic Log will be classified according to the system described in Appendix I of the RCRA Facility Investigation Program Plan. This document was prepared by Sirrine Environmental Consultants for the Savannah River Plant. This form is illustrated on Figure 6.

7.4 Test Boring Report

In addition to the "Field Geologic Log", a "Test Boring Report" form will be completed for each test boring. Soils described on the "Test Boring Report" will be identified using visual/manual techniques

FIGURE 5

COMMUNICATION REPORT

Name _____

Project No. _____

Company _____

Date _____ Time _____

Address _____
_____☐ Telephone Conversation☐ Office Conversation

Telephone No. _____

Re: _____

Recorded By _____

Data:

FIGURE 6
FIELD GEOLOGIC LOG

PROJECT				DATE	SHEET OF
REFERENCE DATUM				DRILLING CONTRACTOR	
WELL NO.				SRP COORDINATES	
LOGGED BY				DRILLER	
COMPANY				DRILLING METHOD	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
	0				
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	0				
	1				
	2				
	3				
	4				
	5				
	6				
	7				
	8				
	9				
	0				

described in ASTM D-2487 and D-2488. The soils will be classified in accordance with the United Soils Classification System. This form is illustrated in Figure 7.

TEST BORING REPORT

BORING NO.

PROJECT: _____
CLIENT: _____
CONTRACTOR: _____
EQUIPMENT USED: _____

JOB NO. _____
PAGE NO. _____
LOCATION: _____
ELEVATION: _____
DATE START: _____
DATE FINISH: _____
DRILLER: _____
PREPARED BY: _____

GROUNDWATER		DEPTH TO:			CASING SAMPLER			CORE BARREL
DATE	MRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE			
					SIZE ID			
					HAMMER WT			X
					HAMMER FALL			

[illegible]

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.		COMPONENT %	GROUNDWATER ABBREV.
0-4	VERY LOOSE	0-2	VERY SOFT	S	SPLIT SPOON	MOSTLY 50-100 % SOME 30-45 % LITTLE 15-25 % FEW 5-10 %	WD - WHILE DRILLING
5-10	LOOSE	3-4	SOFT	T	TUBE		NE - NOT ENCOUNTERED
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	U	UNDISTURBED PISTON		UR - NOT READ
31-50	DENSE	9-15	STIFF	G	GRAB SAMPLE		
51+	VERY DENSE	16-30	VERY STIFF	X	OTHER		

8.0 PROJECT ACCOUNTING

The Savannah River Plant "HP Drilling Subcontractor Expense Record" form will be utilized to keep records of billable drilling activities (Ex: Materials and hourly pay items). A separate form will be completed for each test boring drilled during the Background Soils Study. This form is shown in Figure 8.

FIGURE 8

HP DRILLING SUBCONTRACTOR EXPENSE RECORD

WEEK ENDING	Mo	Day	Year	DRILLING SUBCONTRACTOR							DRILL RIG OPERATOR/RIG NO	
TECHNICAL OVERSIGHT			DAY A) SHIFT	NIGHT B) SHIFT							PROJECT NAME	
CONTRACTOR P.O. NUMBER OR TASK NUMBER			SITE NUMBER		WELL NUMBER(S)			SRP LOCATION				
DESCRIPTION OF EXPENSE (DATE)			(SAT)	(SUN)	(MON)	(TUES)	(WED)	(THURS)	(FRI)	TOTAL UNITS	UNIT RATE	EXTENSION AMOUNT
MOBILIZATION (NO. OF RIGS)												
CORE DRILLING, FEET												
SPT SAMPLES (NO.)												
SHELBY TUBES (NO.)												
ROTARY DRILLING, FT. (DIA)												
AUGER DRILLING, FT. (DIA)												
REAMING HOLE, FEET (DIA)												
STEEL CASING, FEET (DIA)												
PVC SUMP, SCREEN, CASING, FEET (TOTAL + 2.5' STICKUP)												
FILTER PACK & SEAL (EACH)												
GROUT INSTALLED (NO. SACKS)												
REAM GROUT, FEET (DIA.)												
REAM PVC & GROUT, FT. (DIA.)												
OVER-DRILL STEEL, FT. (DIA)												
CASING & SCREEN REMOVAL, FEET												
WELL DEVELOPMENT, (HRS.)												
INSTALL PAD, CASING, POSTS												
INSTALL PUMP, RISER AND ELECTRICAL												
RIG OPERATOR BY HOURLY, (HRS.)												
RIG HELPER BY HOURLY, (HRS.)												
MECHANIC BY HOURLY, (HRS.)												
BACKHOE/OPERATOR HOURLY, (HRS.)												
TOTAL RIG HOURS												
STANDBY W/CREW, (HRS.)												
STANDBY W/O CREW, (HRS.)												
DOWNTIME, (HRS.)												
DRILLER/OVERSIGHT INITIALS: NOTE: INITIAL EACH DAY IF QUANTITIES RECORDED ARE AGREED UPON												
OVERSIGHT HOURS												
OTHER (SPECIFY)												
TOTALS	DRILLING MUD (NO. BAGS)			CENTRALIZERS			GROUT (NO. SACKS)					
	P.V.C. CASING (DIA.) FT.			BENTONITE PELLETS (NO. BUCKETS)			OTHER (SPECIFY)					
	P.V.C. SCREEN (SLOT) FT.			FILTER SAND (NO. BAGS)								
	SUMP			FINE SAND (NO. BAGS)								
OVERSIGHT FIRM				BY				DATE		WEEKLY TOTAL		

**GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND
SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE**

Appendix B.1

Background Soil Sample Locations

BSS-01 Blanton Group

From the intersection of Road 2-1 and Road F-1, travel 0.7 mi. E on Road 2-1. The site is located on the left side (N), approximately 20 feet off the road among some small pine trees.

BSS-02 - Lakeland Group

From the intersection of Road 2-1 and Road F-1, travel 1.35 mi. N-NE on Road F-1. The site is located on the left side (NW), approximately 30 feet off the road among some tall pine trees.

BSS-03 - Fuquay Group

Located on a sandy access road off of Road 2-1, 1.1 mi. E of the Savannah River Forest Station. Turn left (N) onto access road and proceed 0.1 mi. The site is located on the right (E), approximately 30 feet off the road among some pine trees.

BSS-04 - Orangeburg Group

From the intersection of Road 2-1 and Road 2-1-1, turn right (SW) onto Road 2-1-1. Proceed down Road 2-1-1 for 0.15 mi. The site is located on the left side (SE), approximately 40-50 feet off the road among some pine and oak trees.

BSS-06 - Blanton Group

Located on a dirt access road approximately 1.3 mi. W of the intersection of Road 2 and Road C. Travel on the dirt road heading N for 0.5 mi. Proceed on the middle dirt road (NW) at a 3-way fork for 0.3 mi. Site is located on the right, approximately 25 feet off the road among some pine trees.

BSS-07 - Fuquay Group

Located along the C-1 power line, 0.7 mi. N of the intersection of the C-1 power line and Road C. The site is located on the W side of the power line, approximately 25 feet into the treeline.

BSS-08 - Fuquay Group

From the intersection of Road 2-1 and Road E-2, travel 1.4 mi. SE on Road 2-1. A gravel road branches off of Road 2-1 at this point. Proceed 0.3 mi. SE on this road. The site is on the right side (S), approximately 50-60 feet from the road into the treeline.

BSS-09 - Blanton Group

From the intersection of Road 2-1 and Road E-2, travel 2.0 mi. E-SE on Road 2-1. At this point, an overgrown grassy road turns off to the right (SW). Proceed S-SW on this road for 0.1 mi. The site is on the left (SE), approximately 40 feet into a brushy/wooded area.

BSS-10 - Orangeburg Group

From the intersection of Wood Ward Road (A-4) and Road 2-1, travel 1.35 mi. S on Wood Ward Road. The site is on the right side (W), approximately 20-30 feet into the treeline of pines.

BSS-11 - Orangeburg Group

From the intersection of Silverton Road (C-1.1) and Road D, travel 0.15 mi. W on Silverton Road. Turn right (N-NW) onto the dirt road. Proceed 0.7 mi. NW on this dirt road. The site is on the right (NE), near the intersection with another dirt road. It is approximately 20 feet from the road among some pine trees.

BSS-12 - Vaucluse Group

From the intersection of Road 2 and Road C-1.1, turn left (NW) onto Road C-1.1. Proceed 0.4 mi. NW on Road C-1.1. Turn left (SW) onto a dirt road and proceed 0.1 mi. into a recently logged timber clear cut area. The site is located 75 feet to the right (NW) of the road in the cleared area.

BSS-13 - Udorthent Group

From the intersection of Road F and the F-4 power line road, turn onto the dirt road (F-4) and proceed SW for 0.5 mi. The road will open into a pit at this point. Travel along the right side of the pit for 0.15 mi. The site is along the right side (NW) pit wall.

BSS-20 - Udorthent Group

From the Pond C bridge on Road 8, travel 1.6 mi. NE on Road 8. Turn left (NW) onto an unnamed paved road. Travel 1.1 mi. NW on the road, approaching Pond B. The site is on the left (S), approximately 20 feet off the road in a tall grassy clearing.

BSS-21 - Fuquay Group

From the Pond C bridge on Road 8, travel 1.6 mi. NE on Road 8. Turn left (NW) onto an unnamed paved road. Travel 1.0 mi. along this road and turn left (S) onto a sandy access road (which doubles back and parallels the paved road). Proceed on this road 0.5 mi. SE. The site is located on the right (S), approximately 30 feet from the road among some pine trees.

BSS-22 - Lakeland Group

From the Pond C bridge on Road 8, travel 1.6 mi. NE on Road 8. Turn left (NW) onto an unnamed paved road. Travel 1.0 mi. along this road and turn left (S) onto a sandy access road (which doubles back and parallels the paved road). Proceed on this road 1.0 mi. SE. The site is located in a clearing approximately 40 feet from the right side (W) of the road.

BSS-23 - Blanton Group

From the Pond C bridge on Road G, travel 1.2 mi. W on Road G. The site is on the left (S), approximately 40 feet off the road among some pine trees.

BSS-24 - Vaucluse Group

From the intersection of Road H and Road 7, travel 0.7 mi. SW on Road 7. Turn right (NW) onto a winding dirt road and travel 0.2 mi. The site is on the right (SW) side, approximately 20 feet from the road among some pine trees.

BSS-30 - Udorthent Group

From the intersection of Road F and Road B, travel 3.0 mi. NE on Road B. Turn left (N) onto a one-way paved road, which parallels Road B and crosses Par Pond, and travel E. Immediately after crossing Par Pond, turn onto a dirt road to the left (N). Proceed 0.1 mi. N on this road. The site is in a clearing 20 feet

NE of the road.

BSS-31 - Udorthent Group

From the intersection of Road F and Road B, travel 3.0 mi. NE on Road B. Turn left (N) onto a one-way paved road, which parallels Road B and crosses Par Pond, and travel E. After crossing Par Pond, proceed an additional 0.15 mi. NE. The site is on the left (N), 30 feet off the road on the edge of the treeline.

BSS-32 - Fuquay Group

From the intersection of Road B and Road G-2, turn onto Road G-2 and travel N for 0.4 mi. The site is on the left (W), approximately 100 feet off the road among several pine trees.

BSS-33 - Blanton Group

From the intersection of Road B and Road G-2, turn onto Road G-2 and travel 1.0 mi. N. Turn left (W) onto a dirt road (with grass growing in the middle) and travel 0.3 mi. The site is on the left (S), approximately 20 feet off the road among some pine trees.

BSS-34 - Orangeburg Group

From the intersection of Road 9 and Road A-14, turn onto a small dirt road heading NW. Proceed 0.1 mi. along this road. The site is located on the left (W), approximately 20-30 feet among pine trees.

BSS-35 - Blanton Group

From the intersection of Road 9 and Road B-6.2, turn left (E) onto Road B-6.2 and travel 0.4 mi. Turn left (N) onto an overgrown grassy road and proceed 0.35 mi. The site is at the end of the road on the right side (NE).

BSS-36 - Udorthent Group

From the intersection of Road 9 and Road B-6.2, turn left (E) onto Road B-6.2 and travel 0.4 mi. Turn left (N) onto an overgrown grassy road and proceed 0.3 mi. The grassy road will pass underneath a power line. The site is just beyond the power line in a pit. It is on the left (W), approximately 100 feet from the road.

BSS-40 - Orangeburg Group

From the intersection of Road 2 and Road C-2, travel 0.3 mi. SW on Road 2. Turn left (E-SE) onto a dirt road and proceed 0.2 mi. The site is on the right (S), approximately 30 feet off the road among some pine and oak trees.

BSS-41 - Lakeland Group

Located on a dirt road 0.4 mi. NE of Barricade 8 on Road 2. Travel 0.25 mi. SE on the dirt road. The site is on the left side of the road, approximately 40 feet from the road among some pine trees.

BSS-42 - Fuquay Group

From the intersection of the C-1 power line and Road 2, turn onto the C-1 power line road and travel 0.8 mi. N. The site is on the right (E) of the power line, approximately 20 feet into the treeline.

BSS-43 - Blanton Group

From the intersection of the C-1 power line and Road C, turn onto the C-1 power line road and travel 0.2 mi. S. The site is on the right (W) of the power line, approximately 25 feet into the treeline.

BSS-44 - Fuquay Group

Turn onto a small, sandy access road adjacent to Barricade 2 (New Ellenton Wackenhut gate). Proceed E. This road forks immediately. Bear to the right at this fork and travel 0.7 mi. SE. The site is approximately 0.1 mi. from the road (N) in mature pine woods.

BSS-45 - Blanton Group

Turn onto a small, sandy access road adjacent to Barricade 2 (New Ellenton Wackenhut gate). This road forks immediately. Bear to the right at this fork and proceed 0.3 mi. SE. The site is on the left side (N) of the road, among several pine trees, next to a large trench.

BSS-46 - Orangeburg Group

Turn onto the power line road off of Road F, 1.3 mi. SE of the intersection of Road F and Road 2. Take a right onto the power line road. Immediately turn left and proceed 0.2 mi. S-SE on an overgrown grassy road. The site is in a wooded

area near an old trench.

BSS-47 - Vaucluse Group

Go to the intersection of Road 9 and Tennessee Road (locked gate). Take a left (E) onto Tennessee Road. Proceed 1.4 mi. E on Tennessee Road and turn onto Kirkland Road (left turn going N). After 0.2 mi. the road forks. Bear to the right and proceed an additional 0.6 mi. Location is on a hill to the right (NE), approximately 100 feet into a wooded area.

BSS-48 - Lakeland Group

Go to the intersection of Road 9 and Tennessee Road (locked gate). Take a left (E) onto Tennessee Road. Proceed 1.4 mi. E on Tennessee Road and turn onto Kirkland Road (left turn going N). After 0.2 mi. the road forks. Bear to the right and proceed an additional 0.2 mi. The site is on the left (N), approximately 30 feet off the road in a clearing with limited vegetation.

BSS-49 - Fuquay Group

Travel to the intersection of Road 9 and Tennessee Road (locked gate). Take a left (E) onto Tennessee Road. Proceed 2.0 mi. E on Tennessee Road and turn left onto an unnamed road. Proceed 0.5 mi. on this road. Site is on the left (SW) approximately 100 feet up a slope in a densely wooded area.

BSS-50 - Orangeburg Group

From the intersection of Road D and Road 2, travel N approximately 100 yards and turn left (W) onto dirt access road. Proceed approximately 50 yards and site is 50 feet on the right side (N) of dirt road in mature pine woods.

BSS-51 - Lakeland Group

From the intersection of Highway 278 and Highway 19, turn onto Highway 278 and travel E. Go 0.7 mi. and turn onto a small sandy road to the left (N). Travel 0.1 mi. and turn onto a small sandy road to the E. Proceed 0.7 mi. (around a curve) and the site is approximately 30 feet off the road to the right in a grassy clearing.

BSS-52 - Lakeland Group

From the intersection of Highway 278 and Highway 19, turn onto Highway 278 and travel E. Travel 7.6 mi. and bear left at the fork in the road (NE). Proceed 0.1 mi. and the site is approximately 50 feet off the road to the left (NW) in a wooded area.

BSS-53 - Udorthent Group

From the intersection of Road 1 and Road A-1, turn onto Road 1 and travel NE. Go 0.2 mi. and turn left (NW) onto a road paralleling the power line. The site is to the immediate right amongst pine trees in an overgrown grassy area.

BSS-54 - Orangeburg Group

From the intersection of Road 1 and Road A-1, turn onto Road 1 and travel NE. Go 0.85 mi. and the site is on the left side of the road (NW). The site is located 50 feet from the road amongst mature pine trees.

BSS-55 - Udorthent Group

From the intersection of Burma Road and Road C, turn onto Burma Road and travel S-SW. Go 0.2 mi. and turn right (NW) onto a dirt road. Travel an additional 0.1 mi. until it opens into a pit. Turn right into the pit. The site is approximately 500 feet from this point next to an abandoned yellow tractor.

BSS-56 - Lakeland Group

From the intersection of Burma Road and Road C, turn onto Burma Road and travel S-SW. Go 3.0 mi. and turn left (E-SE) onto a small sandy road passing underneath the steam line. Travel 0.1 mi. and the site is on the left (N), approximately 30 feet from the road in a small pine and oak area.

BSS-57 - Lakeland Group

From the intersection of Road A and Road A-15, turn onto Road A-15 and travel SW. Proceed 1.45 mi. At this point, Road A-17.1 intersects Road A-15 from the left. Continue travelling straight (bearing left). This is now Road A-17.1. Proceed 0.65 mi. until Road A-17.1 intersects Road A-17 (Water Gap Road). Turn left onto Road A-17 and proceed 0.85 mi. At this point, a small dirt road branches off to the right into the treeline. This is Tom Roberson Road; turn right (W) onto this road. Proceed 0.2 mi. and the site is on the left (S), approximately 20-30 feet from the road among some large pine trees.

BSS-58 - Udorthent Group

From the intersection of Road A and Road A-14, travel 0.35 mi. NW on Road A. The site is located on a gravel/sand/clay exposure next to a newly paved road, approximately 200 feet to the left (SW) of Road A.

BSS-59 - Vaucluse Group

From the intersection of Road B and Road C, turn onto Road B and travel E. Proceed approximately 1.0 mi. At the power line bear left and enter the first road to the right (SW). Travel down this road 0.3 mi. A road will bear off to the right at this point. Follow this unnamed road 0.1 mi. The site is on the left (SW), approximately 20 feet from the road on a slope amongst many pines and oaks.

**GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND
SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE**

Appendix B.2

ASTM Classification of Background Soil Samples

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-01

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-24

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 08-10-88
DATE FINISH: 08-11-88
DRILLER: B. CABIT
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
08-10		NE			SIZE ID	3-1/4 in.	1-3/8 in.
08-11		NE			HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	POORLY GRADED SAND (SP) Pale brown, dry, mostly fine-grained, subangular quartz sand, trace silt, trace organic material.
			100% Rec.	2.0	10 in. POORLY GRADED SAND (SP) Dark yellowish orange, dry, mostly fine-grained, subangular to subrounded quartz sand, trace silt, trace opaques.
			S 2	2.0	29 in. POORLY GRADED SAND (SP) Same as above, except black staining present.
			79% Rec.	4.0	
5.0			S 3	4.0	57 in. POORLY GRADED SAND WITH SILT (SP-SM) Dark yellowish orange, moist, mostly fine-grained, subangular quartz sand, few clayey silt.
			95% Rec.	6.0	65 in. NOTE: Clay coats quartz grains.
			S 4	6.0	POORLY GRADED SAND WITH CLAY (SP-SC) Dark yellowish orange to light brown, moist, mostly fine-grained subangular quartz sand, few silty clay, trace plinthite nodules.
					NOTE: Mottled appearance
7.5			81% Rec.	8.0	87 in. CLAYEY SAND (SC) Pale yellowish orange, moist, mostly fine to medium-grained, subangular quartz sand, little silty clay.
			S 5	8.0	NOTE: Mottled appearance.
			85% Rec.	10.0	
10.0					

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51 +	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31 +	HARD	NR NO RECOVERY		

BORING NO. BSS-01

ENVIRONMENTAL CONSULTANTS

TEST BORING REPORT

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
12.5			S 6	10.0	<u>CLAYEY SAND (SC)</u> Same as above
15.0			83% Rec.	12.0	144 in.
17.5			S 7	12.0	<u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Dark yellowish orange, saturated, mostly fine-grained, subangular to subrounded quartz sand, few silty clay.
20.0			67% Rec.	14.0	162 in.
22.5			S 8	14.0	178 in.
25.0			100% Rec.	16.0	<u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Pale yellowish orange, saturated, mostly fine-grained, subangular quartz sand, few silty clay. NOTE: Mottled appearance.
27.5			S 9	16.0	192 in.
30.0			81% Rec.	18.0	<u>POORLY GRADED SAND (SP)</u> Yellowish gray, saturated, mostly fine-grained, subangular to subrounded quartz sand, trace clay, trace opaques.
32.5			S 10	18.0	<u>POORLY GRADED SAND (SP)</u> Same as above
35.0			42% Rec.	20.0	
37.5					BOTTOM OF EXPLORATION @ 20.0 FEET

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-01

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-02

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-24

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 08-11-88
DATE FINISH: 08-11-88
DRILLER: B. CABIT
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:			CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	MSA	S	BARREL
08-11		NE			SIZE ID	3-1/4 in.	1-3/8 in.	
					HAMMER WT		140 lb.	
					HAMMER FALL		30 in.	

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	9 in. POORLY GRADED SAND (SP) Dark yellowish brown, dry, mostly fine grained, subangular quartz sand, trace silt, trace organic material.
			85% Rec.	2.0	POORLY GRADED SAND (SP) Dark yellowish orange, dry, mostly fine-grained, subangular to subrounded quartz sand, trace silt.
			S 2	2.0	
			83% Rec.	4.0	48 in. POORLY GRADED SAND (SP) Grayish orange to pale yellowish orange, dry, mostly fine-grained subangular to subrounded quartz sand, trace silt, trace medium to coarse-grained, subangular quartz sand.
5.0			S 3	4.0	
			92% Rec.	6.0	64 in. POORLY GRADED SAND (SP) Dark yellowish orange to light brown, dry, mostly fine-grained, subangular quartz sand, trace silt, trace opaques.
			S 4	6.0	
			96% Rec.	8.0	88 in. POORLY GRADED SAND (SP) Dark yellowish orange to light brown, dry, mostly fine-grained, subangular quartz sand, trace medium to coarse, subangular quartz sand, trace silt, trace opaques.
7.5			S 5	8.0	
			75% Rec.	10.0	
10.0					

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-02

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-02

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
12.5			S 6	10.0	129 in.
			83% Rec.	12.0	
					144 in.
			S 7	12.0	WELL GRADED SAND (SW) Very pale orange to pale yellowish orange, moist, mostly fine to medium-grained, subangular to subrounded quartz sand, few silt, trace coarse-grained, subangular quartz sand, trace opaques.
			92% Rec.	14.0	
15.0			S 8	14.0	POORLY GRADED SAND (SP) White to very pale yellowish orange, moist, mostly fine-grained, subangular to subrounded quartz sand, trace clay. NOTE: Several thin (2" or less) lenses of dark yellowish orange to light brown, fine-grained, subangular quartz sand.
			83% Rec.	16.0	
			S 9	16.0	199 in.
			81% Rec.	18.0	
			S 10	18.0	225 in.
20.0					
			75% Rec.	20.0	
					BOTTOM OF EXPLORATION @ 20.0 FEET

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-03

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-24

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 08-11-88
DATE FINISH: 08-12-88
DRILLER: B. CABIT
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:			CASING		SAMPLER	CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S	
08-11		NE			SIZE ID	3-1/4 in.	1-3/8 in.	
08-12		NE			HAMMER WT		140 lb.	
					HAMMER FALL		30 in.	

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	<u>POORLY GRADED SAND (SP)</u> Dark yellowish brown, moist, mostly fine-grained, trace subangular to subrounded quartz sand, trace silt, trace organic material. <hr/> <u>POORLY GRADED SAND (SP)</u> Grayish orange to pale yellowish brown, moist, mostly fine-grained, subangular to subrounded quartz sand, trace silt.
			100% Rec.	2.0	
			S 2	2.0	
			96% Rec.	4.0	
5.0			S 3	4.0	<hr/> <u>CLAYEY SAND (SC)</u> Grayish orange to dark yellowish orange, moist, mostly fine-grained, subangular to subrounded quartz sand, little clay, trace plinthite nodules. NOTE: Mottled appearance. NOTE: Very difficult drilling.
			100% Rec.	6.0	
			S 4	6.0	
			88% Rec.	8.0	
7.5			S 5	8.0	<hr/> <u>CLAYEY SAND (SC)</u> Same as above
			100% Rec.	10.0	
10.0					

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE < 5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-03

ENVIRONMENTAL CONSULTANTS

BORING NO. BSS-03

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
12.5			S 6	10.0	<u>SANDY CLAY (CL)</u> Pale yellowish orange to moderate reddish brown, moist, mostly clay white clay (kaolin), little fine to medium-grained, subangular quartz sand. NOTE: Mottled appearance.
			85% Rec.	12.0	
			S 7	12.0	146 in. <u>SANDY CLAY (CL)</u> Pale reddish brown, moist, mostly clay, some to little fine to medium-grained, subangular quartz sand.
			100% Rec.	14.0	
			S 8	14.0	168 in. <u>CLAYEY SAND (SC)</u> Light brown to moderate reddish brown, moist, mostly fine-grained, subangular quartz sand, little to some clay. NOTE: Thin kaolinite stringers.
			88% Rec.	16.0	
15.0			S 9	16.0	<u>CLAYEY SAND (SC)</u> Same as above
			96% Rec.	18.0	
			S 10	18.0	<u>CLAYEY SAND (SC)</u> Same as above
			100% Rec.	20.0	
20.0					BOTTOM OF EXPLORATION @ 20.0 FEET

BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-03

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-04

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-24

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 08-15-88
DATE FINISH: 08-15-88
DRILLER: B. CABIT
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:			CASING	SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
08-15		NE			SIZE 10	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	<p>POORLY GRADED SAND WITH SILT (SP-SM) Grayish orange, dry, mostly fine-grained, subangular quartz sand, few silt.</p> <p>-----</p> <p>POORLY GRADED SAND WITH SILT (SP-SM) Light brown to moderate red, dry, mostly fine-grained, subangular quartz sand, few clayey silt.</p> <p>-----</p> <p>SANDY CLAY (CL) Pale reddish brown to moderate reddish brown, moist, mostly clay, some fine to medium-grained, subangular to subrounded quartz sand. NOTE: Dark yellowish orange to light brown mottling.</p> <p>-----</p> <p>SANDY CLAY (CL) Same as above</p> <p>-----</p> <p>SANDY CLAY (CL) Same as above</p>
			83% Rec.	2.0	
			S 2	2.0	
			73% Rec.	4.0	
5.0			S 3	4.0	<p>-----</p> <p>SANDY CLAY (CL) Same as above</p> <p>-----</p> <p>SANDY CLAY (CL) Same as above</p>
			73% Rec.	6.0	
			S 4	6.0	
			96% Rec.	8.0	
7.5			S 5	8.0	<p>-----</p> <p>SANDY CLAY (CL) Same as above</p>
			67% Rec.	10.0	
10.0					

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE < 5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-04

ENVIRONMENTAL CONSULTANTS

TEST BORING REPORT

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
12.5			S 6	10.0	<u>SANDY CLAY (CL)</u> Same as above, except moderate reddish brown to moderate brown. <u>SANDY CLAY (CL)</u> Same as above <u>SANDY CLAY (CL)</u> Same as above <u>SANDY CLAY (CL)</u> Same as above <u>SANDY CLAY (CL)</u> Same as above
			96% Rec.	12.0	
			S 7	12.0	
			96% Rec.	14.0	
15.0			S 8	14.0	
			98% Rec.	16.0	
			S 9	16.0	
			58% Rec.	18.0	
17.5			S 10	18.0	
			75% Rec.	20.0	
20.0					BOTTOM OF EXPLORATION @ 20.0 FEET

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREVIATION
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	Q GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-04

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-06

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-24

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 08-16-88
DATE FINISH: 08-17-88
DRILLER: B. CABIT
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:			CASING SAMPLER			CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S	
08-16		NE			SIZE ID	3-1/4 in.	1-3/8 in.	
08-17		NE			HAMMER WT		140 lb.	
					HAMMER FALL		30 in.	

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	6 in. POORLY GRADED SAND (SP) Yellowish gray to light olive gray, dry, mostly fine-grained, subangular to subrounded quartz sand, trace silt, trace organic material.
			83% Rec.	2.0	POORLY GRADED SAND (SP) Grayish yellow to yellowish gray, dry, mostly fine-grained, subangular quartz sand, trace silt.
			S 2	2.0	
			92% Rec.	4.0	36 in. SILTY SAND (SM) Dark yellowish orange to light brown, dry, mostly fine to medium-grained, angular to subangular quartz sand, little clayey silt. NOTE: Mottled appearance, plinthite development.
5.0			S 3	4.0	50 in. POORLY GRADED SAND WITH CLAY (SP-SC) Pale yellowish orange to dark reddish brown, dry, mostly fine-grained, subangular to subrounded quartz sand, few silty clay. NOTE: Distinct mottling, plinthite development, clay coats quartz grains.
			69% Rec.	6.0	
			S 4	6.0	74 in. CLAYEY SAND (SC) Grayish pink to pale yellowish orange to dark reddish brown, dry, mostly fine-grained, subangular quartz sand, little silty clay. NOTE: Distinct mottling, clay coats quartz grains
			96% Rec.	8.0	
7.5			S 5	8.0	
			75% Rec.	10.0	120 in. SEE NEXT PAGE
10.0					

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		BORING NO. BSS-06

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-06

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
12.5			S 6	10.0	POORLY GRADED SAND WITH CLAY (SP-SC) Light brown to dark yellowish orange, moist, mostly fine-grained, subangular quartz sand, few silty clay.
15.0			85% Rec.	12.0	144 in. POORLY GRADED SAND WITH CLAY (SP-SC) Moderate reddish brown, moist, mostly fine-grained, subangular quartz sand, few silty clay.
17.5			S 7	12.0	173 in. POORLY GRADED SAND WITH CLAY (SP-SC) Grayish orange to pale yellowish orange, moist, mostly fine to medium-grained, subangular quartz sand, few clay. NOTE: Thin laminations of white and pale red purple clay interspersed within this horizon.
20.0			S 8	14.0	POORLY GRADED SAND WITH CLAY (SP-SC) Same as above, except laminations are more common than above.
			77% Rec.	16.0	POORLY GRADED SAND WITH CLAY (SP-SC) Same as above, except laminations are more common than above.
			S 9	16.0	POORLY GRADED SAND WITH CLAY (SP-SC) Same as above, except laminations are more common than above.
			96% Rec.	18.0	POORLY GRADED SAND WITH CLAY (SP-SC) Same as above, except laminations are more common than above.
			S 10	18.0	POORLY GRADED SAND WITH CLAY (SP-SC) Same as above, except laminations are more common than above.
			83% Rec.	20.0	POORLY GRADED SAND WITH CLAY (SP-SC) Same as above, except laminations are more common than above.
					BOTTOM OF EXPLORATION @ 20.0 FEET
BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.	COMPONENT %
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%
				MR NO RECOVERY	
					BORING NO. BSS-06

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-07

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-24

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 08-17-88
DATE FINISH: 08-18-88
DRILLER: B. CABIT
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING SAMPLER CORE			
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
08-17		NE			SIZE ID	3-1/4 in.	1-3/8 in.
08-18		NE			HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	6 in. POORLY GRADED SAND (SP) Yellowish gray to light olive gray, dry, mostly fine-grained, subangular quartz sand, trace silt, trace organic material.
			83% Rec.	2.0	18 in. POORLY GRADED SAND (SP) Very pale orange, dry, mostly fine-grained, subangular to subrounded quartz sand, trace silt.
			S 2	2.0	POORLY GRADED SAND WITH SILT (SP-SM) Moderate yellow to dusky yellow, dry, mostly fine-grained, subangular to subrounded quartz sand, few clayey silt.
			75% Rec.	4.0	36 in. POORLY GRADED SAND WITH SILT (SP-SM) Same as above, except immature plinthite nodules, few clay.
5.0			S 3	4.0	50 in. -----
			83% Rec.	6.0	
7.5			S 4	6.0	SANDY CLAY (CL) Grayish pink to grayish orange to moderate reddish brown, dry, mostly clay, some fine-grained, subangular to subrounded quartz sand. NOTE: Well developed plinthite nodules.
			88% Rec.	8.0	
			S 5	8.0	SANDY CLAY (CL) Same as above, except mottled, plinthite nodules absent.
			100% Rec.	10.0	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		BORING NO. BSS-07

TEST BORING REPORT

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
12.5			S 6	10.0	<u>SANDY CLAY (CL)</u> Moderate reddish brown to grayish pink to grayish orange, moist, mostly clay, some fine-grained, subangular quartz sand. NOTE: Scattered lenses of grayish pink and grayish orange clay.
			98% Rec.	12.0	
15.0			S 7	12.0	<u>SANDY CLAY (CL)</u> Same as above
			60% Rec.	14.0	
17.5			S 8	14.0	<u>SANDY CLAY (CL)</u> Same as above, except mottling more distinct. Trace medium to coarse-grained, subangular to subrounded quartz sand.
			96% Rec.	16.0	
20.0			S 9	16.0	<u>SANDY CLAY (CL)</u> Moderate reddish brown, moist, mostly clay, some fine to medium-grained, subangular to subrounded quartz sand.
			94% Rec.	18.0	
20.0			S 10	18.0	<u>SANDY CLAY (CL)</u> Same as above, except no mottling.
			83% Rec.	20.0	
20.0					BOTTOM OF EXPLORATION @ 20.0 FEET

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0-4	VERY LOOSE	0-4	VERY SOFT	S SPLIT SPOON	MOSTLY 50-100%	WD - WHILE DRILLING
5-10	LOOSE	5-10	SOFT	T TUBE	SOME 30-45%	NE - NOT ENCOUNTERED
11-30	MEDIUM DENSE	11-30	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15-25%	UR - NOT READ
31-50	DENSE	31-50	STIFF	G GRAB SAMPLE	FEW 5-10%	
51+	VERY DENSE	51+	VERY STIFF	X OTHER	TRACE <5%	
			HARD	NR NO RECOVERY		

BORING NO. BSS-07

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-08

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-24

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 08-24-88
DATE FINISH: 08-24-88
DRILLER: B. CABIT
PREPARED BY: R. J. HUNT

GROUND WATER		DEPT. TO:		CASING		SAMPLER	CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
08-24		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	6 in. <u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.
			100% Rec.	2.0	<u>POORLY GRADED SAND WITH SILT (SP-SM)</u> Very pale orange to grayish orange, moist, mostly fine-grained, angular to subangular quartz sand, few clayey silt. NOTE: Clay content increases with depth.
			S 2	2.0	
			94% Rec.	4.0	36 in. <u>CLAYEY SAND (SC)</u> Dark yellowish orange to light brown, moist, mostly fine-grained, angular to subangular quartz sand, little silty clay. NOTE: Mottled appearance, plinthite development.
5.0			S 3	4.0	
			79% Rec.	6.0	
			S 4	6.0	
			90% Rec.	8.0	80 in. <u>CLAYEY SAND (SC)</u> Light brown, moist, mostly fine-grained, angular to subangular quartz sand, little silty clay.
7.5			S 5	8.0	
			81% Rec.	10.0	<u>CLAYEY SAND (SC)</u> Same as above
10.0					

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0-4	VERY LOOSE	0-2	VERY SOFT	S SPLIT SPOON	MOSTLY 50-100%	WD - WHILE DRILLING
5-10	LOCSE	3-4	SOFT	T TUBE	SOME 30-45%	NE - NOT ENCOUNTERED
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15-25%	UR - NOT READ
31-50	DENSE	9-15	STIFF	G GRAV SAMPLE	FEW 5-10%	
51+	VERY DENSE	16-30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-06

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-09

PROJECT: - SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-24

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 08-22-88
DATE FINISH: 08-23-88
DRILLER: B. CABIT
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:			CASING SAMPLER CORE		
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
08-22		NE			SIZE ID	3-1/4 in.	1-3/8 in.
08-23		NE			HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	5 in. <u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained, subangular to subrounded quartz sand, trace silt, trace organic material.
			96% Rec.	2.0	<u>POORLY GRADED SAND (SP)</u> Grayish orange, moist, mostly fine-grained, subangular to subrounded quartz sand, trace silty clay.
			S 2	2.0	
5.0					34 in. <u>WELL GRADED SAND (SW)</u> Grayish orange to dark yellowish orange, moist, mostly fine to medium-grained, subangular to subrounded quartz sand, trace to few coarse-grained, subangular to subrounded quartz sand, trace silty clay.
			90% Rec.	4.0	
			S 3	4.0	52 in. <u>CLAYEY SAND (SC)</u> Dark yellowish orange to moderate reddish brown, moist, mostly fine-grained, subangular quartz sand, little silty clay. NOTE: Mottled appearance.
			96% Rec.	6.0	
7.5			S 4	6.0	
					86 in. <u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Moderate reddish brown, moist, mostly fine-grained, angular to subangular quartz sand, few silty clay.
			81% Rec.	8.0	
			S 5	8.0	
10.0					
			88% Rec.	10.0	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0-4	VERY LOOSE	0-2	VERY SOFT	S SPLIT SPOON	MOSTLY 50-100%	WD - WHILE DRILLING
5-10	LOOSE	3-4	SOFT	T TUBE	SOME 30-45%	NE - NOT ENCOUNTERED
11-20	MEDIUM DENSE	5-8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15-25%	UR - NOT READ
21-30	DENSE	9-15	STIFF	G GRAB SAMPLE	FEW 5-10%	
31+	VERY DENSE	16-30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-09

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-09

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
12.5			S 6	10.0	<u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Same as above
			92% Rec.	12.0	
			S 7	12.0	
			98% Rec.	14.0	
15.0			S 8	14.0	<u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Light brown to moderate reddish brown, moist, mostly fine-grained, angular to subangular quartz sand, few silty clay.
			81% Rec.	16.0	
			S 9	16.0	
			83% Rec.	18.0	
20.0			S 10	18.0	<u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Same as above, except interlaminated with light brown, fine-grained, subangular quartz sand, trace silty clay.
			94% Rec.	20.0	
					BOTTOM OF EXPLORATION @ 20.0 FT.
					</

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-10

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-34

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 08-29-88
DATE FINISH: 08-30-88
DRILLER: J. JACKSON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
08-29		NE			SIZE ID	3-1/4 in.	1-3/8 in.
08-30		NE			HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	6 in. POORLY GRADED SAND (SP) Dark yellowish brown, dry, mostly fine-grained, subangular quartz sand, trace silt, trace organic material.
			96% Rec.	2.0	POORLY GRADED SAND WITH SILT (SP-SM) Light brown to moderate yellowish brown, dry, most fine-grained, subangular quartz sand, few clayey silt.
			S 2	2.0	
			58% Rec.	4.0	46 in.
5.0			S 3	4.0	SANDY CLAY (CL) Light brown, moist, mostly clay, some fine to medium-grained, subangular quartz sand. NOTE: Mottled appearance in places.
			83% Rec.	6.0	72 in.
			S 4	6.0	SANDY CLAY (CL) Light brown to dark yellowish orange to very pale orange, moist, mostly clay, some fine to medium-grained, angular to subangular quartz sand. NOTE: Mottled appearance.
			71% Rec.	8.0	96 in.
7.5			S 5	8.0	CLAYEY SAND (SC) Moderate reddish orange to light brown, dry, mostly fine-grained, subangular quartz sand, little clay. NOTE: Grayish pink laminations and lenses of clay (kaolin).
			50% Rec.	10.0	
10.0					

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-10

TEST BORING REPORT

BORING NO. BSS-11

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE D-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-02-88
DATE FINISH: 09-02-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-02		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE
2.5			S 1	0.0
			56% Rec.	2.0
			S 2	2.0
5.0				
			69% Rec.	4.0
			S 3	4.0
7.5			52% Rec.	6.0
			S 4	6.0
			100% Rec.	8.0
10.0			S 5	8.0
			92% Rec.	10.0

FIELD CLASSIFICATION AND REMARKS

POORLY GRADED SAND (SP)

Olive black, moist, mostly fine-grained, subangular quartz sand, trace silt, trace organic material.

POORLY GRADED SAND WITH SILT (SP-SM)

Light brown, moist, mostly fine-grained, subangular quartz sand, few clayey silt.

SANDY CLAY (CL)

Light brown to moderate reddish brown, moist, mostly clay, some fine-grained, subangular to subrounded quartz sand.
NOTE: Faint mottling.

SANDY CLAY (CL)

Same as above, except trace gravel, distinctive mottling.

BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51 +	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31 +	HARD	NR NO RECOVERY		

BORING NO. BSS-11

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-12

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-24

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 08-19-88
DATE FINISH: 08-22-88
DRILLER: B. CABIT
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	H&A	S
08-19		NE			SIZE ID	3-1/4 in.	1-3/8 in.
08-22		NE			HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
-2.5			S 1	0.0	<u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained, subangular quartz sand, trace silt, trace organic material. 9 in.
-5.0			79% Rec.	2.0	
					<u>WELL GRADED SAND WITH SILT (SW-SM)</u> Light brown to moderate brown, dry, mostly fine to medium-grained, angular to subangular quartz sand, little coarse-grained, angular to subangular quartz sand, few silt. 23 in.
-7.5			S 2	2.0	<u>WELL GRADED SAND WITH CLAY (SW-SC)</u> Same as above, except few silty clay. NOTE: Alternates with well graded gravel.
-10.0			75% Rec.	4.0	
					<u>WELL GRADED SAND WITH CLAY (SW-SC)</u> Same as above, except clay content greater than above.
			S 3	4.0	79 in.
			67% Rec.	6.0	<u>SANDY CLAY (CL)</u> Light brown, moist, mostly clay, some fine to coarse-grained, angular to subangular quartz sand.
			S 4	6.0	<u>SANDY CLAY (CL)</u> Same as above
			79% Rec.	8.0	
			S 5	8.0	
			83% Rec.	10.0	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-12

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-12

PAGE 2 OF 2

FIELD CLASSIFICATION AND REMARKS					
12.5			S 6	10.0	<u>CLAY (CL)</u> Pale yellowish orange to dark yellowish orange, moist, mostly clay, few to little silt, few to little fine-grained, subangular quartz sand. NOTE: Laminated, sand only found in pale yellowish orange laminations.
			96% Rec.	12.0	
			S 7	12.0	
			92% Rec.	14.0	
15.0			S 8	14.0	<u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Grayish orange to light brown, moist, mostly fine-grained, subangular to subrounded quartz sand, few silty clay. <u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Same as above, except interlaminated with very pale orange to grayish red purple clay layers.
			88% Rec.	16.0	
			S 9	16.0	
			96% Rec.	18.0	
17.5			S 10	18.0	<u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Light brownish gray, moist, mostly fine-grained, angular to subangular quartz sand, few silty clay.
			83% Rec.	20.0	
20.0					BOTTOM OF EXPLORATION @ 20.0 FT.

BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		BORING NO. BSS-12

BORING NO. BSS-13

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-24

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION: -
DATE START: 08-19-88
DATE FINISH: 08-19-88
DRILLER: D. KEMPER
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:			CASING	SAMPLER	CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
08-19	WD	7.5 ft	8.0 ft		SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS				
2.5			S 1	0.0	9 in.	POORLY GRADED SAND (SP) Pale yellowish orange to light brown, dry, mostly fine to medium-grained, subangular quartz sand, few coarse-grained, subangular quartz sand, trace opaques.			
			100% Rec.	2.0		POORLY GRADED SAND WITH SILT (SP-SM) Dark yellowish orange to light brown, dry, mostly fine-grained, subangular quartz sand, few silt, trace opaques.			
			S 2	2.0	45 in.				
			100% Rec.	4.0		SILTY SAND (SM) Pale yellowish orange to dark yellowish orange, moist, mostly fine-grained, subangular to subrounded quartz sand, little clayey silt.			
	5.0			S 3		4.0			
				90% Rec.		6.0			
			S 4	6.0	84 in.	CLAYEY SAND (SC) Dusky yellow to grayish orange to very pale orange, saturated, mostly fine-grained, subangular to subrounded quartz sand, few to little silty clay. NOTE: Clay is concentrated in thin white laminations (kaolin).			
			79% Rec.	8.0					
7.5				S 5		8.0			
				100% Rec.		10.0			
	10.0								

BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	Q GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE < 5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-13

**ENVIRONMENTAL
CONSULTANTS**

TEST BORING REPORT

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
12.5			S 6	10.0	<u>CLAYEY SAND (SC)</u> Same as above
15.0			73% Rec.	12.0	
17.5			S 7	12.0	
20.0			85% Rec.	14.0	156 in. <u>SANDY CLAY (CL)</u> Dusky yellow to grayish orange to very pale orange, saturated, mostly clay, some fine-grained subangular to subrounded quartz sand, trace opaques. NOTE: Thinly laminated.
			S 8	14.0	
			83% Rec.	16.0	186 in. <u>WELL GRADED SAND (SW)</u> Yellowish gray, saturated, mostly fine to medium-grained, subrounded quartz sand, few to little coarse-grained, subrounded quartz sand, trace opaques.
			S 9	16.0	
			85% Rec.	18.0	
			S 10	18.0	<u>WELL GRADED SAND (SW)</u> Same as above
			83% Rec.	20.0	
					BOTTOM OF EXPLORATION @ 20.0 FT.

BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNCISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 20	VERY STIFF	X OTHER	TRACE <5%	
		21+	HARD	NR NO RECOVERY		

BORING NO. BSS-13

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-20

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-02-88
DATE FINISH: 09-06-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-02		NE			SIZE ID	3-1/4 in.	1-3/8 in.
09-06		NE			HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	<u>SANDY CLAY (CL)</u> Light brown to moderate reddish brown to dark yellowish orange, moist, mostly clay, some fine-grained, angular to subangular quartz sand. NOTE: Mottled in places.
			94% Rec.	2.0	
			S 2	2.0	
			77% Rec.	4.0	
5.0			S 3	4.0	<u>SANDY CLAY (CL)</u> Same as above
			85% Rec.	6.0	
			S 4	6.0	
			63% Rec.	8.0	
7.5			S 5	8.0	<u>CLAYEY SAND (SC)</u> Grayish red to moderate reddish brown, moist, mostly fine-grained quartz sand, little silty clay, trace m scovite.
			67% Rec.	10.0	
10.0					<u>CLAYEY SAND (SC)</u> Same as above, except 2" layer of grayish red purple lean clay present.

BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE < 5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-20

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-21

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-06-88
DATE FINISH: 09-06-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-06		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	5 in. POORLY GRADED SAND (SP) Olive black, moist, mostly fine-grained quartz sand, trace silt, trace organic material.
			90% Rec.	2.0	POORLY GRADED SAND (SP) Grayish orange, moist, mostly fine-grained quartz sand, trace silt.
			S 2	2.0	POORLY GRADED SAND (SP) Same as above
			60% Rec.	4.0	
5.0			S 3	4.0	47 in. CLAYEY SAND (SC) Light brown to moderate reddish brown, moist, mostly fine-grained quartz sand, little silty clay. NOTE: Mottled appearance, plinthite development.
			67% Rec.	6.0	
			S 4	6.0	CLAYEY SAND (SC) Same as above
			85% Rec.	8.0	
7.5			S 5	8.0	CLAYEY SAND (SC) Same as above
			79% Rec.	10.0	
10.0					

BOTTOM OF EXPLORATION @ 10 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO BSS-21

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-22

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-08-88
DATE FINISH: 09-07-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-08		NE			SIZE ID	3-1/4 in.	1-3/8 in.
09-07		NE			HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS			
2.5			S 1	0.0	7 in. <u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained quartz sand, trace silt, trace organic material.			
					<u>POORLY GRADED SAND (SP)</u> Grayish orange, moist, mostly fine-grained quartz sand, trace silt.			
			83% Rec.	2.0				
			S 2	2.0	28 in. <u>POORLY GRADED SAND (SP)</u> Grayish orange to dark yellowish orange, moist, mostly fine to medium-grained quartz sand, trace silt.			
			67% Rec.	4.0				
	5.0			S 3	4.0	<u>POORLY GRADED SAND (SP)</u> Same as above		
				83% Rec.	6.0			
				S 4	6.0	<u>POORLY GRADED SAND (SP)</u> Same as above		
				67% Rec.	8.0			
		7.5			S 5	8.0	102 in. <u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Light brown to grayish orange, moist, mostly fine to medium-grained quartz sand, few silty clay.	
				100% Rec.	10.0			
10.0						BOTTOM OF EXPLORATION @ 10.0 FT.		
BLOWS/FT. DENSITY			BLOWS/FT. CONSISTENCY		SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.	
0 - 4			VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE		3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED	
11 - 30	MEDIUM DENSE		5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ	
31 - 50	DENSE		9 - 15	STIFF	G GRAIN SAMPLE	FEW 5 - 10%		
51+	VERY DENSE		16 - 30	VERY STIFF	X OTHER	TRACE <5%		
		31+	HARD	NR NO RECOVERY				
BORING NO. BSS-22								

BORING NO. BSS-22

ENVIRONMENTAL CONSULTANTS

BORING NO. BSS-23

PREPARED BY: R. J. HUNT

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS		
2.5			S 1	0.0	7 in.	<u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained quartz sand, trace silt, trace organic material.	
						<u>POORLY GRADED SAND (SP)</u> Pale yellowish orange to grayish orange, moist, mostly fine-grained quartz sand, trace silt, trace opaques.	
			50% Rec.	2.0			
			S 2	2.0		<u>POORLY GRADED SAND (SP)</u> Same as above	
			79% Rec.	4.0			
			S 3	4.0			
5.0					65 in.	<u>POORLY GRADED SAND WITH SILT (SP-SM)</u> Light brown to moderate yellowish brown, moist, mostly fine-grained quartz sand, few clayey silt. NOTE: Some mottling.	
			83% Rec.	6.0			
			S 4	6.0			
			81% Rec.	8.0			
			S 5	8.0		<u>POORLY GRADED SAND WITH SILT (SP-SM)</u> Same as above	
			83% Rec.	10.0			
10.0					BOTTOM OF EXPLORATION @ 10.0 FT.		
BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.		COMPONENT %	GROUND WATER ABBREVIATION
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S	SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T	TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U	UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G	GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X	OTHER	TRACE <5%	
		31+	HARD	NR	NO RECOVERY		
BORING NO. BSS-23							

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-24

PROJECT: - SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-07-88
DATE FINISH: 09-07-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	MSA	S
09-07		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	3 in. <u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained quartz sand, trace silt, trace organic material.
					<u>POORLY GRADED SAND (SP)</u> Grayish orange, moist, mostly fine-grained sand, trace silt, trace gravel (rounded quartz cobbles).
			100% Rec.	2.0	23 in. <u>SANDY CLAY (CL)</u> Light brown to moderate reddish brown to pale yellowish orange, dry, mostly clay, little coarse-grained sand and gravel.
			S 2	2.0	
5.0					
			83% Rec.	4.0	
			S 3	4.0	55 in. <u>WELL GRADED SAND WITH SILT (SW-SM)</u> Dark yellowish orange to moderate reddish brown to grayish pink, dry, mostly fine to coarse-grained quartz sand, few clayey silt, trace gravel. NOTE: Kaolin present.
			88% Rec.	6.0	
7.5			S 4	6.0	<u>WELL GRADED SAND WITH SILT (SW-SM)</u> Same as above
			81% Rec.	8.0	
			S 5	8.0	<u>WELL GRADED SAND WITH SILT (SW-SM)</u> Same as above
10.0					
			83% Rec.	10.0	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT HEAD
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-24

**ENVIRONMENTAL
CONSULTANTS**

TEST BORING REPORT

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS			
			S 6	10.0	<u>WELL GRADED SAND WITH SILT (SW-SM)</u> NOTE: Drilling ceases due to hardness of material. Blow counts excess of 100.			
			88% Rec.	12.0	BOTTOM OF EXPLORATION @ 12.0 FT.			
	12.5							
15.0								

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-30

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE 8-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-07-88
DATE FINISH: 09-07-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER		CORE BARREL	
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S		
09-07		NE			SIZE ID	3-1/4 in.	1-3/8 in.		
					HAMMER WT		140 lb.		
					HAMMER FALL		30 in.		

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	SANDY SILT (ML) Light brown, dry, mostly silt, some fine to medium-grained quartz sand, few clay, trace gravel. 15 in.
			90% Rec.	2.0	
			S 2	2.0	
			100% Rec.	4.0	
5.0			S 3	4.0	55 in. POORLY GRADED SAND WITH SILT (SP-SM) Dark yellowish-orange, dry, mostly fine-grained quartz sand, few clayey silt, trace medium to coarse-grained sand. NOTE: Mottled in places.
			71% Rec.	6.0	
			S 4	6.0	
			81% Rec.	8.0	
7.5			S 5	8.0	74 in. SANDY CLAY (CL) Dark yellowish orange to very pale orange, moist, mostly clay, some fine to medium-grained quartz sand. NOTE: Mottled in places.
10.0					POORLY GRADED SAND WITH SILT (SP-SM) Same as above
			75% Rec.	10.0	

BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-30

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-31

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-08-88
DATE FINISH: 09-08-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER		CORE	
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HS/A	S	BARREL	
09-08		NE			SIZE ID	3-1/4 in.	1-3/8 in.		
					HAMMER WT		140 lb.		
					HAMMER FALL		30 in.		

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	<p>POORLY GRADED SAND WITH SILT (SP-SM) Light brown, moist, mostly fine-grained, angular to subangular quartz sand, few clayey silt, trace organic material.</p> <p>POORLY GRADED SAND WITH SILT (SP-SM) Same as above, except mottled appearance.</p>
			96% Rec.	2.0	
			S 2	2.0	
			79% Rec.	4.0	
5.0			S 3	4.0	<p>SANDY CLAY (CL) Moderate red to dark yellowish orange to very pale orange, moist, mostly clay, some fine to medium-grained quartz sand, trace coarse-grained quartz sand. NOTE: Kaolin present.</p>
			83% Rec.	6.0	
			S 4	6.0	
			100% Rec.	8.0	
7.5			S 5	8.0	<p>SANDY SILT (ML) Grayish orange to light brown, moist, mostly silt, some fine-grained quartz sand, few clay NOTE: Kaolin present, mottled in areas.</p>
			92% Rec.	10.0	
10.0					

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-31

ENVIRONMENTAL CONSULTANTS

BORING NO. BSS-31

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
12.5			S 6	10.0	<u>SANDY SILT (ML)</u> Same as above
			96% Rec.	12.0	140 in. <u>SILTY SAND (SM)</u> Moderate reddish brown to grayish orange, moist, mostly fine to coarse-grained quartz sand, little clayey silt. NOTE: Kaolin present, mottled in areas
			S 7	12.0	<u>SILTY SAND (SM)</u> Same as above, except kaolin found in laminations.
			92% Rec.	14.0	
15.0			S 8	14.0	170 in. <u>POORLY GRADED SAND WITH SILT (SP-SM)</u> Dark yellowish orange to moderate red, most fine-grained quartz sand, few clayey silt, trace coarse-grained sand and gravel. NOTE: Thinly laminated.
			79% Rec.	16.0	
			S 9	16.0	<u>POORLY GRADED SAND WITH SILT (SP-SM)</u> Same as above, except pale red purple to light brownish gray.
			83% Rec.	18.0	
17.5			S 10	18.0	<u>POORLY GRADED SAND WITH SILT (SP-SM)</u> Same as above
			88% Rec.	20.0	
20.0					BOTTOM OF EXPLORATION @ 20.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-31

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-32

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-08-88
DATE FINISH: 09-08-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-08		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	POORLY GRADED SAND (SP) Moderate yellowish brown, moist, mostly fine-grained, angular to sub-rounded quartz sand, trace organic material. POORLY GRADED SAND (SP) Grayish orange to pale yellowish brown, moist, mostly fine-grained subangular to subrounded quartz sand, trace silt.
			92% Rec.	2.0	
			S 2	2.0	
			98% Rec.	4.0	
5.0			S 3	4.0	SANDY CLAY (CL) Pale yellowish brown to light brown, moist, mostly clay, some fine-grained, angular to subrounded quartz sand, trace plinthite nodules. NOTE: Mottled appearance.
			88% Rec.	6.0	
			S 4	6.0	
			94% Rec.	8.0	
7.5			S 5	8.0	POORLY GRADED SAND WITH CLAY (SP-SC) Pale yellowish orange to light brown, moist, mostly fine-grained, angular to subangular quartz sand, few silty clay. NOTE: Mottled appearance.
			79% Rec.	10.0	
10.0					BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOGTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-32

TEST BORING REPORT

BORING NO. BSS-33

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-14-88
DATE FINISH: 09-14-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-14		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	POORLY GRADED SAND (SP) Olive gray, moist, mostly fine-grained, subangular quartz sand, trace silt, trace organic material. POORLY GRADED SAND (SP) Grayish orange, moist, mostly fine-grained, angular to subangular quartz sand, trace silty clay, trace opaques.
			96% Rec.	2.0	
			S 2	2.0	
			98% Rec.	4.0	
5.0			S 3	4.0	POORLY GRADED SAND (SP) Same as above, except dark yellowish orange.
			100% Rec.	6.0	
			S 4	6.0	
			84% Rec.	8.0	
7.5			S 5	8.0	CLAYEY SAND (SC) Light brown to moderate reddish brown to v.s.y pale orange, moist, mostly fine to medium-grained, angular to subangular quartz sand, little silty clay. NOTE: Mottled appearance, minor plinthite development. CLAYEY SAND (SC) Same as above, but kaolin percentage increases.
			77% Rec.	10.0	
10.0					BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		BORING NO. BSS-33

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-34

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-13-88
DATE FINISH: 09-13-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-13		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	<u>POORLY GRADED SAND (SP)</u> 6 in. Olive black, moist, mostly fine-grained, subangular to subrounded quartz sand, trace silt, trace organic material. <u>POORLY GRADED SAND WITH SILT (SP-SM)</u> Moderate brown, moist, mostly fine-grained, subangular quartz sand, few clayey silt. NOTE: Quartz sand grains are coated.
			90% Rec.	2.0	
			S 2	2.0	
			44% Rec.	4.0	
5.0			S 3	4.0	<u>CLAYEY SAND (SC)</u> 28 in. Moderate reddish brown, dry, mostly fine-grained, angular to subangular quartz sand, little silty clay, trace coarse-grained, angular, quartz sand.
			79% Rec.	6.0	
			S 4	6.0	
			81% Rec.	8.0	
7.5			S 5	8.0	80 in. <u>SILTY SAND WITH GRAVEL (SM)</u> Dark yellowish orange to moderate yellowish brown, dry, mostly fine to medium-grained quartz sand, little clayey silt, little rounded quartz gravel.
10.0			NR	10.0	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0-4	VERY LOOSE	0-2	VERY SOFT	S SPLIT SPOON	MOSTLY 50-100%	WD - WHILE DRILLING
5-10	LOOSE	3-4	SOFT	T TUBE	SOME 30-45%	NE - NOT ENCOUNTERED
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15-25%	UR - NOT READ
31-50	DENSE	9-15	STIFF	G GRAB SAMPLE	FEW 5-10%	
51+	VERY DENSE	16-30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		BORING NO. BSS-34

ENVIRONMENTAL CONSULTANTS

TEST BORING REPORT

PAGE 2 OF 2

[illegible]

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-35

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-09-88
DATE FINISH: 09-09-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-09		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	5 in. <u>POORLY GRADED SAND (SP)</u> Olive gray, moist, mostly fine-grained, angular to subangular quartz sand, trace organics.
				2.0	<u>POORLY GRADED SAND (SP)</u> Light brown, moist, mostly fine-grained, subangular to subrounded quartz sand, trace opaques.
			S 2	2.0	<u>POORLY GRADED SAND (SP)</u> Same as above
				4.0	
5.0			S 3	4.0	
				6.0	60 in. <u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Light brown to moderate reddish brown, moist, mostly fine-grained, subangular to subrounded quartz sand, few silty clay. NOTE: Mottled appearance in places.
			S 4	6.0	
				8.0	94 in. <u>CLAYEY SAND (SC)</u> Light brown to moderate reddish brown, moist, mostly fine to medium-grained, subangular to subrounded quartz sand, little silty clay.
7.5			S 5	8.0	
				10.0	
10.0					BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0-4	VERY LOOSE	0-2	VERY SOFT	S SPLIT SPOON	MOSTLY 50-100%	WD - WHILE DRILLING
5-10	LOOSE	3-4	SOFT	T TUBE	SOME 30-45%	NE - NOT ENCOUNTERED
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15-25%	UR - NOT READ
31-50	DENSE	9-15	STIFF	G GRAB SAMPLE	FEW 5-10%	
51+	VERY DENSE	16-30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-35

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-36

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-12-88
DATE FINISH: 09-12-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER		CORE BARREL	
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S		
09-12		NE			SIZE ID	3-1/4 in.	1-3/8 in.		
					HAMMER WT		140 lb.		
					HAMMER FALL		30 in.		

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 8 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	POORLY GRADED SAND (SP) Olive black, moist, mostly fine-grained, subangular to subrounded quartz sand, trace silt, trace organic material.
			71% Rec.	2.0	
			S 2	2.0	
			100% Rec.	4.0	
5.0			S 3	4.0	36 in. POORLY GRADED SAND (SP) Grayish orange, moist, mostly fine-grained, angular to subrounded quartz sand, trace clayey silt. 52 in. CLAYEY SAND (SC) Light brown to yellowish gray to dark yellowish orange, moist, mostly fine to coarse-grained, angular to subangular quartz sand, little silty clay. NOTE: Mottled appearance.
			79% Rec.	6.0	
			S 4	6.0	
			77% Rec.	8.0	
7.5			S 5	8.0	96 in. WELL GRADED SAND WITH CLAY (SW-SC) Light brown to yellowish gray to dark yellowish orange, moist, mostly fine to coarse-grained, angular to subangular quartz sand, few silty clay. NOTE: Mottled appearance, kaolin present.
			83% Rec.	10.0	
10.0					

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-36

SIRRIINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-36

PAGE 2 OF 2

DEPTH IN FEET			CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS	
12.5					S 6	10.0	WELL GRADED SAND WITH CLAY (SW-SC) Same as above	
					88% Rec.	12.0		
					S 7	12.0	WELL GRADED SAND WITH CLAY (SW-SC) Same as above, except kaolin percentage increased, percentage medium to coarse-grained sand increased.	
15.0								
					94% Rec.	14.0	163 in. <u>CLAYEY SAND (SC)</u> Yellowish gray to light brown to dark yellowish orange, moist, mostly fine to coarse-grained, angular to subangular quartz sand, little silty clay. NOTE: Mottled appearance, high percentage of clay is kaolin.	
					S 8	14.0		
					88% Rec.	16.0		
17.5					S 9	16.0	<u>CLAYEY SAND (SC)</u> Same as above	
					54% Rec.	18.0		
					S 10	18.0	<u>CLAYEY SAND (SC)</u> Same as above	
20.0								
					85% Rec.	20.0		
							BOTTOM OF EXPLORATION @ 20.0 FT.	
BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.		COMPONENT %	GROUND WATER ABBREV.	
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S	SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING	
5 - 10	LOOSE	3 - 4	SOFT	T	TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED	
11 - 20	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U	UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ	
21 - 30	DENSE	9 - 15	STIFF	G	GRAB SAMPLE	FEW 5 - 10%		
31+	VERY DENSE	16 - 30	VERY STIFF	X	OTHER	TRACE <5%		
		31+	HARD	NR	NO RECOVERY		BORING NO. BSS-36	

TEST BORING REPORT

BORING NO. BSS-40

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-15-88
DATE FINISH: 09-15-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HAS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-15		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	<p>POORLY GRADED SAND (SP) Olive black, moist, mostly fine-grained, angular to subangular, quartz sand, trace silt, trace organic material.</p> <p>POORLY GRADED SAND WITH CLAY (SP-SC) Moderate reddish brown, moist, mostly fine-grained, subangular quartz sand, few silty clay.</p> <p>SANDY CLAY (CL) Moderate brown, moist, mostly clay, some fine-grained, angular to subangular quartz sand.</p>
			88% Rec.	2.0	
			S 2	2.0	
			50% Rec.	4.0	
			S 3	4.0	
5.0					<p>SANDY CLAY (CL) Same as above, except trace coarse-grained, subangular quartz sand.</p>
			64% Rec.	6.0	
			S 4	6.0	
			92% Rec.	8.0	
			S 5	8.0	
7.5					<p>SANDY CLAY (CL) Same as above</p>
			94% Rec.	10.0	
10.0					

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT RECD
31 - 50	DENSE	9 - 16	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	18 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-40

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-41

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-14-88
DATE FINISH: 09-14-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER		CORE BARREL	
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S		
09-14		NE			SIZE ID	3-1/4 in.	1-3/8 in.		
					HAMMER WT		140 lb.		
					HAMMER FALL		30 in.		

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	5 in. POORLY GRADED SAND (SP) Olive gray, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.
			83% Rec.	2.0	POORLY GRADED SAND (SP) Grayish orange, moist, mostly fine-grained, angular to subangular quartz sand, trace clayey silt.
			S 2	2.0	
5.0					
			81% Rec.	4.0	
			S 3	4.0	POORLY GRADED SAND (SP) Same as above
7.5					
			79% Rec.	6.0	
			S 4	6.0	76 in. POORLY GRADED SAND (SP) Very pale orange, mostly fine-grained, angular to subangular quartz sand.
10.0			81% Rec.	8.0	
			S 5	8.0	104 in. POORLY GRADED SAND WITH CLAY (SP-SC) Dark yellowish orange to light brown, moist, mostly fine-grained, angular to subangular quartz sand, few silty clay. NOTE: Mottled appearance.
			88% Rec.	10.0	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		BORING NO. BSS-41

TEST BORING REPORT

BORING NO. BSS-42

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE 8-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-20-88
DATE FINISH: 09-20-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-20		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS		
2.5			S 1	0.0	9 in.	POORLY GRADED SAND (SP) Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.	
						POORLY GRADED SAND WITH SILT (SP-SM) Yellowish gray, moist, mostly fine-grained, angular to subangular quartz sand, trace silt.	
5.0			S 2	2.0	45 in.		
7.5			S 3	4.0	79 in.	SANDY CLAY (CL) Moderate reddish brown to light brown, moist, mostly clay, some fine to medium-grained, subangular quartz sand, trace rounded cobbles. NOTE: Mottled appearance, plinthis development.	
10.0			S 4	6.0		SANDY CLAY (CL) Moderate reddish brown to light brown to very pale orange, moist, mostly clay, some fine to medium-grained, subangular to angular quartz sand. NOTE: Distinct mottled appearance.	
BOTTOM OF EXPLORATION @ 10.0 FT.							
BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.		COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S	SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T	TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U	UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G	GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X	OTHER	TRACE <5%	
		31+	HARD	NR	NO RECOVERY		BORING NO. BSS-42

ENVIRONMENTAL CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-43

PROJECT: _____ - SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: _____ E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: _____ MONITOR TESTING CORPORATION
EQUIPMENT USED: _____ MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-23-88
DATE FINISH: 09-23-88
DRILLER: E. BARRO
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:			CASING SAMPLER			CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S	
09-23		NE			SIZE ID	3-1/4 in.	1-3/8 in.	
					HAMMER WT		140 lb.	
					HAMMER FALL		30 in.	

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS	
2.5			S 1	0.0	<u>POORLY GRADED SAND (SP)</u> 6 in. Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.	
			83% Rec.	2.0	<u>POORLY GRADED SAND (SP)</u> Yellowish gray, moist, mostly fine-grained, angular to subangular quartz sand, trace silt.	
5.0			S 2	2.0		
			79% Rec.	4.0	40 in. <u>POORLY GRADED SAND (SP)</u> Grayish orange, moist, mostly fine-grained, angular to subangular quartz sand, trace silt.	
7.5			S 3	4.0		
			96% Rec.	6.0	67 in. <u>SANDY CLAY (CL)</u> Moderate reddish brown to dark yellowish orange, moist, mostly clay, some fine to medium-grained, angular to subangular quartz sand. NOTE: Mottled appearance.	
10.0			S 4	6.0		
			96% Rec.	8.0		
			S 5	8.0	<u>SANDY CLAY (CL)</u> Same as above	
			94% Rec.	10.0		
					BOTTOM OF EXPLORATION @ 10.0 FT.	
BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		
						BORING NO. BSS-43

TEST BORING REPORT

BORING NO. BSS-44

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-19-88
DATE FINISH: 09-19-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-19		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	<p>7 in. <u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.</p> <p><u>POORLY GRADED SAND WITH SILT (SP-SM)</u> Yellowish gray, moist, mostly fine-grained, angular to subangular quartz sand, trace silt.</p>
5.0			S 2	2.0	
7.5			S 3	4.0	<p>37 in. <u>SANDY CLAY (CL)</u> Moderate reddish brown to dark yellowish orange to yellowish gray, moist, mostly clay, some fine to medium-grained, subangular quartz sand. NOTE: Mottled appearance.</p>
10.0			S 4	6.0	
			S 5	8.0	<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>
					<p><u>SANDY CLAY (CL)</u> Same as above</p>

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-45

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-19-88
DATE FINISH: 09-19-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

GROUND WATER			DEPTH TO:		CASING	SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-19		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE
2.5			S 1	0.0
5.0			88% Rec.	2.0
			S 2	2.0
7.5			94% Rec.	4.0
			S 3	4.0
10.0			83% Rec.	6.0
			S 4	6.0
			81% Rec.	8.0
			S 5	8.0
			88% Rec.	10.0

FIELD CLASSIFICATION AND REMARKS

POORLY GRADED SAND (SP)

5 in. Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.

POORLY GRADED SAND (SP)

Yellowish gray, moist, mostly fine-grained, angular to subangular quartz sand, trace silt.

SANDY CLAY (CL)

59 in. Moderate reddish brown, moist, mostly clay, some fine to medium-grained, angular to subangular quartz sand.

SANDY CLAY (CL)

Same as above

BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-45

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-46

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-15-88
DATE FINISH: 09-16-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-15		NE			SIZE ID	3-1/4 in.	1-3/8 in.
09-16		NE			HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	POORLY GRADED SAND (SP) Olive black, moist, mostly fine-grained, subangular to angular quartz sand, trace silt, trace organic material. 10 in.
5.0			83% Rec.	2.0	10 in. POORLY GRADED SAND WITH SILT (SP-SM) Light brown, moist, mostly fine-grained, subangular to angular quartz sand, few clayey silt. 22 in.
7.5			S 2	2.0	SANDY CLAY (CL) Light brown to moderate reddish brown, moist, mostly clay, some fine-grained, subangular quartz sand.
10.0			75% Rec.	4.0	75 in. SANDY CLAY (CL) Light brown to dark yellowish orange, dry, mostly clay, some fine to medium-grained, angular to subangular quartz sand, trace coarse-grained, angular to subangular quartz sand. NOTE: Mottled appearance.
			S 3	4.0	102 in. SANDY CLAY (CL) Light brown to dark yellowish orange to very pale orange, dry, mostly clay, some fine to coarse-grained, angular quartz sand. NOTE: Plinthite development.
			83% Rec.	6.0	
			S 4	6.0	
			54% Rec.	8.0	
			S 5	8.0	
			100% Rec.	10.0	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAV SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-46

ENVIRONMENTAL CONSULTANTS

TEST BORING REPORT

PAGE 2 OF 2

DEPTH IN FEET		CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS	
12.5				S 6	10.0	SANDY CLAY (CL) Same as above	
				71% Rec.	12.0		
				S 7	12.0	148 in. SANDY CLAY (CL) Light brown to grayish orange, moist, mostly clay, some fine to medium-grained, angular to subangular quartz sand. NOTE: Faint mottling in places.	
				88% Rec.	14.0		
				S 8	14.0	177 in. LEAN CLAY (CL) Light brown to pale yellowish orange to light bluish gray, moist, mostly clay, trace fine to medium-grained, angular to subangular quartz sand, trace muscovite. NOTE: Distorted pockets and laminations of clay.	
15.0							
				92% Rec.	16.0		
				S 9	16.0		
				90% Rec.	18.0		
				S 10	18.0	LEAN CLAY (CL) Same as above	
17.5							
				96% Rec.	20.0		
20.0						BOTTOM OF EXPLORATION @ 20.0 FT.	

BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-46

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-47

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-21-88
DATE FINISH: 09-21-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-21		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	POORLY GRADED SAND (SP) Olive black, moist, mostly fine-grained, subangular to quartz sand, trace silt, trace organic material. 12 in.
5.0			88% Rec.	2.0	SANDY CLAY (CL) Light brown to moderate reddish brown, moist, mostly clay, some fine to medium-grained, angular to subangular quartz sand. 38 in.
			S 2	2.0	
7.5			94% Rec.	4.0	POORLY GRADED SAND WITH SILT (SP-SM) Light brown, moist, mostly fine to medium-grained, angular to subangular quartz sand, few clayey silt. NOTE: Scattered small lenses of kaolin. 82 in.
			S 3	4.0	
10.0			79% Rec.	6.0	POORLY GRADED SAND WITH CLAY (SP-SC) Grayish orange, moist, mostly fine-grained, angular to subangular quartz sand, few silty clay.
			S 4	6.0	
			84% Rec.	8.0	
			S 5	8.0	
			86% Rec.	10.0	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-47

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-47

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS	
12.5			S 6	10.0	<p><u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Same as above.</p> <p>134 in. <u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Same as above, except fine to medium-grained, angular to subangular quartz sand and grayish-blue clay "pockets" interspersed.</p>	
			77%			
			Rec.	12.0		
			S 7	12.0		
			84% Rec.	14.0		
			S 8	14.0		
15.0					<p>180 in. <u>SILTY SAND (SM)</u> Moderate yellow to dark yellowish orange, moist, mostly fine-grained angular to subangular quartz sand, few silt and clay, trace muscovite, trace medium to coarse, subangular to angular quartz sand.</p>	
			94% Rec.	16.0		
			S 9	16.0		
			100% Rec.	18.0		
			S 10	18.0		
17.5					<p><u>SILTY SAND (SM)</u> Same as above, except pale orange to dark yellowish orange to grayish red purple. NOTE: Faint laminations present. Kaolin present in laminations.</p>	
20.0					<p>BOTTOM OF EXPLORATION @ 20.0 FT.</p>	
BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		BORING NO. BSS-47

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-48

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-21-88
DATE FINISH: 09-21-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-21		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	4 in. POORLY GRADED SAND (SP) Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.
			83% Rec.	2.0	POORLY GRADED SAND (SP) Light brown to dark yellowish orange, moist, mostly fine-grained, angular to subangular quartz sand, trace clayey silt, trace opaques.
			S 2	2.0	POORLY GRADED SAND (SP) Same as above
			75% Rec.	4.0	
5.0			S 3	4.0	48 in. POORLY GRADED SAND (SP) Same as above, except some thin horizons of very pale orange sand.
			88% Rec.	6.0	
			S 4	6.0	POORLY GRADED SAND (SP) Same as above, except light brown.
			85% Rec.	8.0	
7.5			S 5	8.0	POORLY GRADED SAND (SP) Same as above
			79% Rec.	10.0	
10.0					

BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-48

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-49

PROJECT: - SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-21-83
DATE FINISH: 09-21-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER		CORE BARREL	
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	s		
09-21		NE			SIZE 10	3-1/4 in.	1-3/8 in.		
					HAMMER WT		140 lb.		
					HAMMER FALL		30 in.		

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	<u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.
					<u>POORLY GRADED SAND (SP)</u> Grayish orange, moist, mostly fine-grained, angular to subangular quartz sand, trace opaques.
			94% Rec.	2.0	
			S 2	2.0	
5.0					41 in. <u>SANDY CLAY (CL)</u> Light brown to moderate reddish brown, moist, mostly clay, some fine to medium-grained, angular to subangular quartz sand. NOTE: Mottled appearance, plinthite development.
			96% Rec.	4.0	
			S 3	4.0	
			77% Rec.	6.0	
7.5			S 4	6.0	<u>SANDY CLAY (CL)</u> Same as above
			81% Rec.	8.0	
			S 5	8.0	<u>SANDY CLAY (CL)</u> Same as above
10.0					
			88% Rec.	10.0	

BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51 +	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE < 5%	
		31 +	HARD	NR NO RECOVERY		

BORING NO. BSS-49

TEST BORING REPORT

BORING NO. BSS-50

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY									
CLIENT: E. I. DUPONT de NEMOURS - SRP									
CONTRACTOR: MONITOR TESTING CORPORATION									
EQUIPMENT USED: MOBILE B-28									
GROUND WATER		DEPTH TO:			CASING			SAMPLER	CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S		
08-19		NE			SIZE ID	3-1/4 in.	1-3/8 in.		
					HAMMER WT		140 lb.		
					HAMMER FALL		30 in.		
DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS				
2.5			S 1	0.0	POORLY GRADED SAND (SP) 6 in. Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material. POORLY GRADED SAND WITH SILT (SP-SM) Moderate reddish brown, moist, mostly fine-grained, angular to subangular quartz sand, few clayey silt.				
			98% Rec.	2.0					
			S 2	2.0					
			92% Rec.	4.0					
5.0			S 3	4.0	SANDY CLAY (CL) Same as above				
			83% Rec.	6.0					
			S 4	6.0					
			79% Rec.	8.0					
7.5			S 5	8.0	SANDY CLAY (CL) Same as above				
			71% Rec.	10.0					
10.0					BOTTOM OF EXPLORATION @ 10.0 FT.				
BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV			
0-4	VERY LOOSE	0-2	VERY SOFT	S SPUT SPOON	MOSTLY 50-100%	WD - WHILE DRILLING NE - NOT ENCOUNTERED UR - NOT READ			
5-10	LOOSE	3-4	SOFT	T TUBE	SOME 30-45%				
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15-25%				
31-50	DENSE	9-15	STIFF	G GRAB SAMPLE	FEW 5-10%				
51+	VERY DENSE	16-30	VERY STIFF	X OTHER	TRACE <5%				
		31+	HARD	NR NO RECOVERY					

BORING NO. BSS-50

TEST BORING REPORT

BORING NO. BSS-51

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 2
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-19-88
DATE FINISH: 09-19-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER		CORE	
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S	BARREL	
09-19		NE			SIZE ID	3-1/4 in.	1-3/8 in.		
					HAMMER WT		150 lb.		
					HAMMER FALL		30 in.		

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	5 in. POORLY GRADED SAND (SP) Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.
			85% Rec.	2.0	POORLY GRADED SAND (SP) Dark yellowish orange to moderate yellowish brown, moist, mostly fine-grained, angular to subangular quartz sand, trace silt.
			S 2	2.0	
			40% Rec.	4.0	
5.0			S 3	4.0	
			92% Rec.	6.0	64 in. POORLY GRADED SAND (SP) Same as above, except very pale orange to pale yellowish orange.
			S 4	6.0	
			94% Rec.	8.0	87 in. POORLY GRADED SAND WITH CLAY (SP-SC) Pale yellowish orange to grayish orange, moist, mostly fine-grained, angular to subangular quartz sand, few silty clay.
7.5			S 5	8.0	
			83% Rec.	10.0	104 in. CLAYEY SAND (SC) Light brown to dark yellowish orange, moist, mostly fine-grained, angular to subangular quartz sand, little silty clay. NOTE: Mottled appearance.
10.0					120 in.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	X GRAB SAMPLE	FEW 5 - 10%	
51 +	VERY DENSE	16 - 30	VERY STIFF	Y OTHER	TRACE <5%	
		31 +	HARD	NR NO RECOVERY		

BORING NO. BSS-51

ENVIRONMENTAL CONSULTANTS

BORING NO. BSS-51

PAGE 2 OF 2

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS				
12.5			S 6	10.0	<u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Light brown to pale red purple, moist, mostly fine-grained, angular to subangular quartz sand, few silt and clay. NOTE: Pockets of purple clay with main sandy unit.				
			83% Rec.	12.0					
			S 7	12.0	<u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Same as above				
			85% Rec.	14.0					
	15.0			S 8	14.0	169 in. <u>WELL GRADED SAND WITH CLAY (SW-SC)</u> Light brown to pale red purple, moist, mostly fine to medium-grained, subangular to angular quartz sand, few silty clay, trace coarse-grained, angular to subangular quartz sand.			
				83% Rec.	16.0				
				S 9	16.0	177 in. <u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Dark yellowish orange, moist, mostly fine-grained, angular to subangular quartz sand, few silty clay. NOTE: Three inch gravel layer (177" - 180"). Quartz gravel is subrounded to rounded.			
				81% Rec.	18.0				
		20.0			S 10	18.0	<u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Same as above, except relict laminations, trace coarse-grained sand.		
					83% Rec.	20.0			
BOTTOM OF EXPLORATION @ 20.0 FT.									

BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.	COMPONENT %	GROUND WATER ABBREVIATION
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-51

TEST BORING REPORT

BORING NO. BSS-52

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-20-88
DATE FINISH: 09-20-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:			CASING SAMPLER			CORE BARREL
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S	
09-20		NE			SIZE ID	3-1/4 in.	1-3/8 in.	
					HAMMER WT		140 lb.	
					HAMMER FALL		30 in.	

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS		
			S 1	0.0	5 in.	<u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.	
			75% Rec.	2.0		<u>POORLY GRADED SAND (SP)</u> Grayish orange to dark yellowish orange, moist, mostly fine-grained, angular to subangular quartz sand, trace silty clay.	
2.5			S 2	2.0		<u>POORLY GRADED SAND (SP)</u> Same as above	
			41% Rec.	4.0			
5.0			S 3	4.0	81 in.	<u>POORLY GRADED SAND (SP)</u> Same as above, except very pale orange.	
			85% Rec.	6.0			
7.5			S 4	6.0			
			88% Rec.	8.0			
10.0			S 5	8.0	102 in.	<u>POORLY GRADED SAND WITH SILT (SP-SM)</u> Same as above, except light brown to dark yellowish orange.	
			71% Rec.	10.0			
BOTTOM OF EXPLORATION @ 10.0 FT.							
BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.		COMPONENT %	GROUND WATER ABBREV
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S	SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T	TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 20	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U	UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	Q	GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X	OTHER	TRACE <5%	
		31+	HARD	NR	NO RECOVERY		
BORING NO. BSS-52							

TEST BORING REPORT

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION: _____
DATE START: 09-20-88
DATE FINISH: 09-20-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0-4	VERY LOOSE	0-2	VERY SOFT	S SPLIT SPOON	MOSTLY 50-100%	WD - WHILE DRILLING
5-10	LOOSE	3-4	SOFT	T TUBE	SOME 30-45%	NE - NOT ENCOUNTERED
11-30	MEDIUM DENSE	5-8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15-25%	UR - NOT READ
31-50	DENSE	9-15	STIFF	G GRAB SAMPLE	FEW 5-10%	
51+	VERY DENSE	16-30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		BORING NO. BSS-53

BORING NO. BSS-53

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-54

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-22-88
DATE FINISH: 09-22-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-22		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	6 in. <u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.
			92% Rec.	2.0	<u>POORLY GRADED SAND (SP)</u> Moderate yellowish brown, moist, mostly fine-grained, angular to subangular quartz sand, trace silty clay.
			S 2	2.0	24 in. <u>SANDY CLAY (CL)</u> Light brown, moist, mostly clay, some fine-grained, angular to subangular quartz sand.
			83% Rec.	4.0	
			S 3	4.0	<u>SANDY CLAY (CL)</u> Same as above
5.0			90% Rec.	6.0	68 in. <u>CLAYEY SAND (SC)</u> Dark yellowish orange, moist, mostly fine to medium-grained, angular to subangular quartz sand, little silty clay.
			S 4	6.0	
			100% Rec.	8.0	93 in. <u>SANDY CLAY (CL)</u> Light brown, moist, mostly silty clay, some fine to coarse-grained, angular to subangular quartz sand.
			S 5	8.0	
			96% Rec.	10.0	
7.5					
10.0					

BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51 +	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE < 5%	
		31 +	HARD	NR NO RECOVERY		

BORING NO. BSS-54

TEST BORING REPORT

BORING NO. BSS-55

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-23-88
DATE FINISH: 09-23-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-23		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	<u>CLAYEY SAND (SC)</u> Light brown, moist, mostly fine to medium-grained, angular to subangular quartz sand, little silt and clay, trace coarse-grained, angular to subangular quartz sand, trace rounded quartz gravel.
			83% Rec.	2.0	
			S 2	2.0	
			100% Rec.	4.0	
5.0			S 3	4.0	<u>CLAYEY SAND (SC)</u> Same as above
			100% Rec.	6.0	
			S 4	6.0	
			75% Rec.	8.0	
7.5			S 5	8.0	<u>WELL GRADED SAND WITH CLAY (SW-SC)</u> Light brown to grayish orange, moist, mostly fine to coarse-grained, angular to subangular quartz sand, few silty clay.
			88% Rec.	10.0	
10.0					

BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-55

TEST BORING REPORT

BORING NO. BSS-56

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-20-88
DATE FINISH: 09-20-88
DRILLER: J. RENDER
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER	CORE
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-20		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS			
2.5			S 1	0.0	5 in.	<u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.		
			71% Rec.	2.0		<u>POORLY GRADED SAND (SP)</u> Dark yellowish orange, moist, mostly fine-grained, angular to subangular quartz sand, trace silt.		
			S 2	2.0	<u>POORLY GRADED SAND (SP)</u> Same as above			
			90% Rec.	4.0				
	5.0			S 3	4.0	59 in.	<u>POORLY GRADED SAND (SP)</u> Very pale orange, moist, mostly fine-grained, angular to subangular quartz sand.	
				92% Rec.	6.0			
				S 4	6.0	<u>POORLY GRADED SAND (SP)</u> Same as above		
			100% Rec.	8.0				
7.5				S 5	8.0	109 in.	<u>POORLY GRADED SAND WITH CLAY (SP-SC)</u> Light brown, moist, mostly fine-grained, angular to subangular quartz sand, few clay.	
				98% Rec.	10.0			
						BOTTOM OF EXPLORATION @ 10.0 FT.		
	BLOWS/FT. DENSITY		BLOWS/FT. CONSISTENCY		SAMPLE ID.		COMPONENT %	GROUND WATER ABBREV.
	0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S	SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
	5 - 10	LOOSE	3 - 4	SOFT	T	TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
	11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U	UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
	31 - 50	DENSE	9 - 15	STIFF	G	GRAB SAMPLE	FEW 5 - 10%	
	51+	VERY DENSE	16 - 30	VERY STIFF	X	OTHER	TRACE <5%	
			31+	HARD	NR	NO RECOVERY		
BORING NO. BSS-56								

BORING NO. BSS-56

SIRRINE

ENVIRONMENTAL
CONSULTANTS

TEST BORING REPORT

BORING NO. BSS-57

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-26-88
DATE FINISH: 09-26-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING		SAMPLER		CORE	
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S	BARREL	
09-26		NE			SIZE ID	3-1/4 in.	1-3/8 in.		
					HAMMER WT		140 lb.		
					HAMMER FALL		30 in.		

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	<p><u>POORLY GRADED SAND (SP)</u> Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material.</p> <p><u>POORLY GRADED SAND (SP)</u> Moderate brown, moist, mostly fine-grained, angular to subangular quartz sand, trace silt.</p>
5.0			81% Rec.	2.0	
			S 2	2.0	
7.5			71% Rec.	4.0	<p><u>POORLY GRADED SAND (SP)</u> Same as above</p>
			S 3	4.0	
10.0			88% Rec.	6.0	<p><u>POORLY GRADED SAND (SP)</u> Same as above</p>
			S 4	6.0	
			85% Rec.	8.0	<p><u>POORLY GRADED SAND (SP)</u> Same as above</p>
			S 5	8.0	
			79% Rec.	10.0	<p><u>POORLY GRADED SAND (SP)</u> Same as above</p>

BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51 +	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31 +	HARD	NR NO RECOVERY		

BORING NO. BSS-57

TEST BORING REPORT

BORING NO. BSS-58

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. D'PONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-26-88
DATE FINISH: 09-26-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER		DEPTH TO:		CASING SAMPLER CORE			
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-26		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	POORLY GRADED GRAVEL WITH CLAY (GP-GC) Light brown to moderate yellowish brown, moist, mostly rounded quartz gravel, some fine to medium-grained, subangular to subrounded quartz sand, little clay and silt.
			100% Rec.	2.0	
			S 2	2.0	
			88% Rec.	4.0	
5.0			S 3	4.0	POORLY GRADED GRAVEL WITH CLAY (GP-GC) Same as above
			85% Rec.	6.0	
			S 4	6.0	
			67% Rec.	8.0	
7.5			S 5	8.0	POORLY GRADED GRAVEL WITH CLAY (GP-GC) Same as above
			77% Rec.	10.0	
10.0					BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 20	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
21 - 30	DENSE	9 - 15	STIFF	Q GRAB SAMPLE	FEW 5 - 10%	
31 +	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31 +	HARD	NR NO RECOVERY		

BORING NO. BSS-58

TEST BORING REPORT

BORING NO. BSS-59

PROJECT: SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY
CLIENT: E. I. DUPONT de NEMOURS - SRP
CONTRACTOR: MONITOR TESTING CORPORATION
EQUIPMENT USED: MOBILE B-28

JOB NO: G-8163
PAGE NO: 1 OF 1
LOCATION: SEE PLAN
ELEVATION:
DATE START: 09-27-88
DATE FINISH: 09-27-88
DRILLER: E. BARRON
PREPARED BY: R. J. HUNT

GROUND WATER			DEPTH TO:		CASING SAMPLER CORE		
DATE	HRS AFTER COMP	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE	HSA	S
09-27		NE			SIZE ID	3-1/4 in.	1-3/8 in.
					HAMMER WT		140 lb.
					HAMMER FALL		30 in.

DEPTH IN FEET	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
2.5			S 1	0.0	POORLY GRADED SAND WITH SILT (SP-SM) Olive black, moist, mostly fine-grained, angular to subangular quartz sand, trace silt, trace organic material. SANDY CLAY (CL) Pale yellowish orange to light brown, moist, mostly clay, some fine to medium-grained, angular to subangular quartz sand, trace muscovite. SANDY CLAY (CL) Same as above
			92% Rec.	2.0	
			S 2	2.0	
			100% Rec.	4.0	
5.0			S 3	4.0	POORLY GRADED SAND WITH CLAY (SP-SC) Light brown, moist, mostly fine to medium-grained, angular to subangular quartz sand, few silty clay. NOTE: Clay coats sand grains.
			85% Rec.	6.0	
			S 4	6.0	
			71% Rec.	8.0	
7.5			S 5	8.0	POORLY GRADED SAND WITH CLAY (SP-SC) Same as above, except thin laminations of very pale orange to grayish purple clay.
			77% Rec.	10.0	
10.0					BOTTOM OF EXPLORATION @ 10.0 FT.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE ID.	COMPONENT %	GROUND WATER ABBREV.
0 - 4	VERY LOOSE	0 - 2	VERY SOFT	S SPLIT SPOON	MOSTLY 50 - 100%	WD - WHILE DRILLING
5 - 10	LOOSE	3 - 4	SOFT	T TUBE	SOME 30 - 45%	NE - NOT ENCOUNTERED
11 - 30	MEDIUM DENSE	5 - 8	MEDIUM STIFF	U UNDISTURBED PISTON	LITTLE 15 - 25%	UR - NOT READ
31 - 50	DENSE	9 - 15	STIFF	G GRAB SAMPLE	FEW 5 - 10%	
51+	VERY DENSE	16 - 30	VERY STIFF	X OTHER	TRACE <5%	
		31+	HARD	NR NO RECOVERY		

BORING NO. BSS-59

**GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND
SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE**

Appendix B.3

Modified Wentworth Classification of Background Soil Samples

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-11-88	SHEET 1 OF 2
WELL NO. BSS-01					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 90,532 E 78,598	DRILLER B. CABIT
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			100	SAND, VERY FINE TO MEDIUM-GRAINED, PALE BROWN, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, DRY.	
	2				SAND, VERY FINE TO MEDIUM GRAINED, DARK YELLOWISH ORANGE, MODERATELY SORTED, SUBROUNDED, TRACE SILT, TRACE OPAQUES, DRY.	
2	3			79	SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE, BROWNISH BLACK STAINING, MODERATELY SORTED, SUBANGULAR TO, SUBROUNDED TRACE SILT, TRACE OPAQUES, MOIST.	
	4					
3	5			95	SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE, MODERATELY SORTED, SUBANGULAR, WITH SILT (5-10%), MOIST.	
	6				SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE TO LIGHT BROWN, MODERATELY SORTED, SUBANGULAR, WITH CLAY (5-10%), TRACE PLINTHITE NODULES, MOTTLED, MOIST.	
4	7			81	SAND, VERY FINE TO VERY COARSE- GRAINED, PALE YELLOWISH ORANGE, POORLY SORTED, SUBANGULAR, WITH CLAY (15-20%), MOTTLED, MOIST.	
	8					
5	9			85		
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-11-86	SHEET 2 OF 2
WELL NO. BSS-01					REFERENCE DATUM N 90,532 E 78,598	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					DRILLER B. CABIT	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)
COMPANY SIRRINE ENV. CONS.						

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			83	SAND, VERY FINE TO VERY COARSE-GRAINED, PALE YELLOWISH ORANGE, POORLY SORTED, SUBANGULAR, WITH CLAY (15-20%), MOTTLED, MOIST.	
7	12			67	SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE, WELL SORTED, SUBANGULAR TO SUBROUNDED, WITH CLAY (5-10%), SATURATED.	
8	13			100	CLAY, VERY PALE ORANGE, SOFT, MOIST.	
9	14			81	SAND, VERY FINE TO MEDIUM-GRAINED, PALE YELLOWISH ORANGE, WELL SORTED, SUBANGULAR, WITH CLAY (5-10%), MOTTLED, SATURATED.	
10	15			42	SAND, VERY FINE TO MEDIUM-GRAINED, YELLOWISH GRAY, SUBANGULAR TO SUBROUNDED, TRACE CLAY, TRACE OPAQUES, SATURATED.	
	16				SAME AS ABOVE	
	17					
	18					
	19					
	20					
BOTTOM OF EXPLORATION AT 20.0 FT.						

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-11-88	SHEET 1 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-02					SRP COORDINATES N 95,318 E 82,743	
LOGGED BY R. J. HUNT					DRILLER B. CABIT	
COMPANY SIRRINE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			85	SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH BROWN, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, DRY.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, DRY.	
2	3			83	SAME AS ABOVE	
	4					
3	5			92	SAND, VERY FINE TO VERY COARSE-GRAINED, GRAYISH ORANGE TO PALE YELLOWISH ORANGE, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, DRY.	
	6					
4	7			96		
	8				SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE TO LIGHT BROWN, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE OPAQUES, DRY.	
5	9			75	SAND, VERY FINE TO VERY COARSE-GRAINED, DARK YELLOWISH ORANGE TO LIGHT BROWN, POORLY SORTED, SUBANGULAR, TRACE SILT, TRACE OPAQUES, DRY.	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-11-88	SHEET 2 OF 2
WELL NO. BSS-02					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 95,318 E 82,743	DRILLER B. CABIT
					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			83	SAND, SAME AS RUN 5.	
12						
7	13			92	SAND, GRANULES TO VERY FINE, VERY PALE ORANGE TO PALE YELLOWISH ORANGE, POORLY SORTED, SUBANGULAR TO SUBROUNDED, WITH SILT (5-10%), TRACE OPAQUES, MOIST.	
14						
8	15			83	SAME AS ABOVE	
16						
9	17			81	SAND, VERY FINE TO MEDIUM-GRAINED, BLuish WHITE, MODERATELY SORTED, SUBANGULAR, TRACE CLAY, TRACE OPAQUES MOIST.	
	18					
10	19	75	SAND, GRANULES TO VERY FINE, DARK YELLOWISH BROWN, POORLY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, TRACE OPAQUES, MOIST.			
	20					
					BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-12-88	SHEET 1 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-03					SRP COORDINATES N 98,098 E 71,525	
LOGGED BY R. J. HUNT					DRILLER B. CABIT	
COMPANY SIRRIANE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			100	SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH BROWN, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
					SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE TO PALE YELLOWISH BROWN, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, MOIST.	
2	3			96		
3	5			100	SAND, VERY FINE TO MEDIUM GRAINED, GRAYISH ORANGE TO DARK YELLOWISH ORANGE, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, WITH CLAY (20-25%), TRACE PLINTHITE NODULES, MOTTLED, MOIST.	GREAT DIFFICULTY IN ADVANCING AUGERS, SMOKE COMING FROM HOLE.
4	7			88	SAME AS ABOVE	
5	9			100	SAME AS ABOVE, except no plinthite nodules.	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-12-88	SHEET 2 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-03					SRP COORDINATES N 98, 098 E 71,525	
LOGGED BY R. J. HUNT					DRILLER B. CABIT	
COMPANY SIRRINE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			85	CLAY, HARD, PALE YELLOWISH ORANGE TO MODERATE REDDISH BROWN, MOTTLED, WITH SAND (20-25%), MOIST.	
7	12			100	CLAY, SANDY (25-30%), HARD, PALE REDDISH BROWN; VERY FINE TO MEDIUM GRAINED, POORLY SORTED, SUBANGULAR, MOIST.	
8	13			88	SAND, CLAYEY (25-30%), VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO MODERATE REDDISH BROWN, MODERATELY SORTED, SUBANGULAR; FIRM, MOIST.	
9	14			96	SAME AS ABOVE	
10	15			100	SAME AS ABOVE	
	16					
	17					
	18					
	19					
	20					
BOTTOM OF EXPLORATION AT 20.0 FT.						

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-15-88	SHEET 1 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-04					SRP COORDINATES N 86,104 E 81,171	DRILLER B. CABIT
LOGGED BY R. J. HUNT					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS	
1	1			83	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, SUBANGULAR, WITH SILT (5-10%), DRY.		
	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO MODERATE RED, MODERATELY SORTED, SUBANGULAR, WITH SILT (5-10%), MOIST.						
2	2			73			
	3				CLAY, SANDY(35-40%), PALE REDDISH BROWN TO MODERATE REDDISH BROWN, HARD, MOTTLED; VERY FINE TO VERY COARSE- GRAINED, POORLY SORTED, SUBANGULAR, TO SUBROUNDED, MOIST.	DRILLING VERY DIFFICULT. SMOKE COMING FROM HOLE.	
3	4			73			
	5				SAME AS ABOVE		
4	6			96			
	7				SAME AS ABOVE		
5	8			67			
	9				SAME AS ABOVE		
	10						

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-15-88	SHEET 2 OF 2
WELL NO. BSS-04					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 86,104 E 81,171	DRILLER B. CABIT
					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			96	CLAY, SANDY (35-40%). MODERATE REDDISH BROWN TO MODERATE BROWN. HARD. MOTTLED: VERY FINE TO VERY COARSE. POORLY SORTED. SUBANGULAR TO SUBROUNDED. MOIST.	
	12					
7	13			96	SAME AS ABOVE	
	14					
8	15			98	SAME AS ABOVE	
	16					
9	17			58	SAME AS ABOVE	
	18					
10	19			75	SAME AS ABOVE	
	20					
					BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-17-88	SHEET 1 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-06					SRP COORDINATES N 97,184 E 41,132	DRILLER B. CABIT
LOGGED BY R. J. HUNT					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			83	SAND, VERY FINE TO MEDIUM-GRAINED, YELLOWISH GRAY TO LIGHT OLIVE GRAY, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, TRACE ORGANIC MATERIAL, DRY.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH YELLOW TO YELLOWISH GRAY, MODERATELY SORTED, SUBANGULAR, TRACE SILT, DRY.	
2	3			92	SAND, VERY FINE TO VERY COARSE-GRAINED, DARK YELLOWISH ORANGE TO LIGHT BROWN, POORLY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (15-20%), TRACE PLINTHITE NODULES, MOTTLED, DRY.	
	4					
3	5			69	SAND, VERY FINE TO MEDIUM-GRAINED, PALE YELLOWISH ORANGE TO DARK REDDISH BROWN, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, WITH CLAY (5-10%), TRACE PLINTHITE NODULES, MOTTLED, DRY.	
	6					
4	7			96	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH PINK TO PALE YELLOWISH ORANGE TO DARK REDDISH BROWN, MODERATELY SORTED, SUBANGULAR, WITH CLAY (20-25%), MOTTLED, DRY.	
	8					
5	9			75	SAME AS ABOVE	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-17-88	SHEET 2 OF 2
WELL NO. BSS-06					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 97,184 E 41,132	DRILLER B. CABIT
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	10			85	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO DARK YELLOWISH ORANGE, MODERATELY SORTED, SUBANGULAR, WITH CLAY (5-10%), MOIST.	
	11					
	12					
7	13			100	SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE REDDISH BROWN, MODERATELY SORTED, SUBANGULAR, WITH CLAY (5-10%), MOIST.	
	14					
	15					
8	16			77	SAND, VERY FINE TO COARSE-GRAINED, GRAYISH ORANGE TO PALE YELLOWISH ORANGE, POORLY SORTED, SUBANGULAR, WITH CLAY (5-10%), THINLY LAMINATED, MOIST.	
	17					
	18					
9	19			96	SAME AS ABOVE	
	20					
10	21			83	SAME AS ABOVE	
	22					
	23					
	24				BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-18-88	SHEET 1 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-07					SRP COORDINATES N 96,099 E 43,067	DRILLER B. CABIT
LOGGED BY R. J. HUNT					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			83	SAND, VERY FINE TO MEDIUM-GRAINED, YELLOWISH GRAY TO LIGHT OLIVE GRAY, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, DRY.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, VERY PALE ORANGE, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, DRY.	
2	3			75	SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE YELLOW TO DUSKY YELLOW, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, WITH SILT (5-10%), TRACE PLINTHITE NODULES, DRY.	
	4					
3	5			83	CLAY, SANDY (35-40%), GRAYISH PINK TO ORANGE TO MODERATE REDDISH BROWN, HARD; VERY FINE TO MEDIUM-GRAINED, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED; TRACE PLINTHITE NODULES, DRY.	
	6					
4	7			88	SAME AS ABOVE	
	8					
5	9			100	CLAY, SANDY (35-40%), GRAYISH PINK TO GRAYISH ORANGE TO MODERATE REDDISH BROWN, MOTTLED, HARD; VERY FINE TO MEDIUM-GRAINED, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, DRY.	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-18-88	SHEET 2 OF 2
WELL NO. BSS-07					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 96,099 E 43,067	DRILLER B. CABIT
					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			98	CLAY, SANDY (35-40%), MODERATE REDDISH BROWN TO GRAYISH PINK TO GRAYISH ORANGE, HARD; VERY FINE TO MEDIUM-GRAINED, MODERATELY SORTED, SUBANGULAR, MOIST.	
	12				SAME AS ABOVE	
7	13			60		
	14					
8	15			96	CLAY, MODERATE REDDISH BROWN TO GRAYISH ORANGE, MOTTLED, HARD, TRACE SAND, MOIST.	
	16					
9	17			94	CLAY, SANDY (30-45%), MODERATE TO REDDISH BROWN, MOTTLED, HARD, VERY FINE TO COARSE-GRAINED, POORLY SORTED, SUBANGULAR TO SUBROUNDED, MOIST.	
	18					
10	19			83	CLAY, SANDY (30-45%), MODERATE REDDISH BROWN, HARD; VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, SUBANGULAR TO SUBROUNDED, MOIST.	
	20					
					BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-24-88	SHEET 1 OF 2
WELL NO. BSS-08					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 72,281 E 84,950	DRILLER B. CABIT
					COMPANY SIRRIANE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			100	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, VERY PALE ORANGE TO GRAYISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), MOIST.	
2	3			94	SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE TO LIGHT BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (15-20%), TRACE PLINTHITE NODULES, MOTTLED, MOIST.	
	4					
3	5			79	SAME AS ABOVE	
	6					
4	7			90	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (15-20%), MOIST.	
	8					
5	9			81	SAME AS ABOVE	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-24-88	SHEET 2 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-08					SRP COORDINATES N 72,281 E 84,950	
LOGGED BY R. J. HUNT					DRILLER B. CABIT	
COMPANY SIRRIE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			73	SAME AS ABOVE	
					SAND, GRANULES TO VERY FINE, PALE YELLOWISH ORANGE TO LIGHT BROWN, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOTTLED, MOIST.	
7	13			100	SAND, VERY FINE TO VERY COARSE- GRAINED, PALE YELLOWISH ORANGE TO LIGHT BROWN, POORLY SORTED SUBANGULAR, WITH CLAY (5-10%), MOTTLED, MOIST.	
8	15			94	SAME AS ABOVE	
	17				BOTTOM OF EXPLORATION AT 16.0 FT.	
	18					
	19					
	20					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-23-88	SHEET 1 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-09					SRP COORDINATES N 70,468 E 87,894	DRILLER B. CABIT
LOGGED BY R. J. HUNT					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			96	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE CLAY, MOIST.					
2	2			90		
	3				SAND, GRANULES TO VERY FINE, GRAYISH ORANGE TO DARK YELLOWISH ORANGE, VERY POORLY SORTED, SUBANGULAR TO SUBROUNDED, TRACE CLAY, MOIST.	
3	4			96		
	5				SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE TO MODERATE REDDISH BROWN, MODERATELY SORTED, SUBANGULAR, WITH CLAY (15-20%), MOTTLED, MOIST.	
4	6			81		
	7				SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE REDDISH BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
5	8			88		
	9				SAME AS ABOVE	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-23-88	SHEET 2 OF 2
WELL NO BSS-09					REFERENCE DATUM N 70,468 E 87,894	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					DRILLER B. CABIT	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)
COMPANY SIRRINE ENV. CONS.						

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			92	SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE REDDISH BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
7	12			98	CLAY, SANDY(30-45%), LIGHT BROWN TO MODERATE REDDISH BROWN, FIRM; VERY GRANULES TO VERY FINE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
8	13			81	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO MODERATE REDDISH BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
9	14			83	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWNISH GRAY, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
10	15			94	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWNISH GRAY, MODERATELY SORTED, SUBANGULAR, WITH CLAY (5-10%), LAMINATED, MOIST.	
	16					
	17					
	18					
	19					
	20					
					BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-30-88	SHEET 1 of 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-10					SRP COORDINATES N 63,148 E 85,332	
LOGGED BY R. J. HUNT					DRILLER J. JACKSON	
COMPANY SIRRIE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			96	SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH BROWN, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, DRY.	
	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO MODERATE YELLOWISH BROWN, MODERATELY SORTED, SUBANGULAR, WITH SILT (5-10%), DRY.					
2	2			58	SAME AS ABOVE	
	3					
3	4			83	CLAY, SANDY (40-45%), LIGHT BROWN, MOTTLED, HARD; VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, SUBANGULAR, MOIST.	
	5					
4	6			71	CLAY, SANDY (40-45%), LIGHT BROWN TO DARK YELLOWISH ORANGE TO VERY PALE ORANGE, MOTTLED, HARD; VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, SUBANGULAR, MOIST.	
	7					
5	8			50	SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE REDDISH ORANGE TO LIGHT BROWN, MODERATELY SORTED, SUBANGULAR, WITH CLAY (15-20%), THINLY LAMINATED, DRY.	
	9					
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-30-88	SHEET 2 OF 2
WELL NO. BSS-10			REFERENCE DATUM		DRILLING CONTRACTOR MONITOR TESTING CO.	
LOGGED BY R. J. HUNT			SRP COORDINATES N 63,148 E 85,332		DRILLER J. JACKSON	
			COMPANY SIRRIE ENV. CONS.		DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			71	SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE REDDISH ORANGE TO LIGHT BROWN, POORLY SORTED, SUBANGULAR, WITH CLAY (15-20%), THINLY LAMINATED, DRY.	
	12					
7	13			75	SAME AS ABOVE	
	14					
8	15			92	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO GRAYISH RED PURPLE, MODERATELY SORTED, SUBANGULAR, WITH CLAY (15-20%), TRACE MUSCOVITE, MOIST.	
	16					
9	17			88	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO GRAYISH RED PURPLE, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, WITH CLAY (5-10%), TRACE MUSCOVITE, MOIST.	
	18					
10	19			69	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO GRAYISH RED PURPLE, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, WITH CLAY (5-10%), TRACE MUSCOVITE, MOIST.	
	20				BOTTOM OF EXPLORATION AT 19.5 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER-PLANT BACKGROUND SOILS STUDY					DATE 09-02-88	SHEET 1 OF 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-11					SRP COORDINATES N 103,768 E 45,841	
LOGGED BY R. J. HUNT					DRILLER E. BARRON	
COMPANY SIRRIE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS	
1	1			56	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.		
	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN, MODERATELY SORTED, SUBANGULAR, WITH SILT (5-10%), MOIST.						
2	2			69			
	3						
3	4			52	CLAY, SANDY (40-45%), LIGHT BROWN TO MODERATE REDDISH BROWN, FIRM, MOTTLED; VERY FINE TO MEDIUM-GRAINED, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, MOIST.		
	5				SAME AS ABOVE		
4	6			100			
	7				SAME AS ABOVE		
5	8			92	CLAY, SANDY (40-45%), LIGHT BROWN TO MODERATE REDDISH BROWN, FIRM, MOTTLED; VERY FINE TO MEDIUM-GRAINED, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE GRAVEL, MOIST.		
	9						
	10						
					BOTTOM OF EXPLORATION AT 10.0 FT.		

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-22-88	SHEET 1 OF 2
WELL NO. BSS-12					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 95,572 E 48,098	DRILLER B. CABIT
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			79	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, GRANULES TO VERY FINE, LIGHT BROWN TO MODERATE BROWN, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), DRY.	
2	3			75	SAND, GRANULES TO VERY FINE, BROWN TO MODERATE BROWN, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), DRY.	
	4					
3	5			67	SAME AS ABOVE	
	6					
4	7			79	CLAY, SANDY (35-40%), LIGHT BROWN, GRANULES TO VERY FINE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	8					
5	9			83	SAME AS ABOVE	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-22-88	SHEET 2 OF 2
WELL NO. BSS-12					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 95,572 E 48,098	DRILLER B. CABIT
					COMPANY SIRRIANE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			96	CLAY, PALE YELLOWISH ORANGE TO DARK YELLOWISH ORANGE. FIRM, THINLY LAMINATED, WITH SILT (10-15%), WITH SAND (10-15%), MOIST.	
7	12			92	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE TO LIGHT BROWN, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, WITH CLAY (5-10%), MOIST.	
8	13			88	SAND, FINE-GRAINED, GRAYISH ORANGE TO LIGHT BROWN, WELL SORTED, SUBANGULAR TO SUBROUNDED, WITH CLAY (5-10%), THINLY LAMINATED, MOIST.	
9	14			96	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWNISH GRAY, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
10	15			83	SAME AS ABOVE	
	16					
	17					
	18					
	19					
	20					
					BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-19-88	SHEET 1 OF 2
WELL NO. BSS-13					REFERENCE DATUM SRP COORDINATES N 84,171 E 61,158	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					DRILLER D. KEMPER	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)
COMPANY SIRRINE ENV. CONS.						

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			100	SAND, VERY FINE TO VERY COARSE-GRAINED, PALE YELLOWISH ORANGE TO LIGHT BROWN, POORLY SORTED, SUBANGULAR, TRACE OPAQUES, DRY.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE TO LIGHT BROWN, MODERATELY SORTED, SUBANGULAR, WITH SILT (5-10%), TRACE OPAQUES, DRY.	
2	3			100		
	4					
3	5			90	SAND, VERY FINE TO MEDIUM-GRAINED, PALE YELLOWISH ORANGE TO DARK YELLOWISH ORANGE, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, WITH SILT (15-20%), TRACE OPAQUES, MOIST.	
	6					
4	7			79		
	8				SAND, VERY FINE TO MEDIUM-GRAINED, DUSKY YELLOW TO GRAYISH ORANGE TO VERY PALE ORANGE, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, WITH CLAY (10-15%), THINLY LAMINATED, SATURATED.	WATER ENCOUNTERED AT 7.5 FT.
5	9			100		
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 08-19-88	SHEET 2 OF 2
WELL NO. BSS-13					REFERENCE DATUM N 84,171 E 61,158	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					DRILLER D. KEMPER	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)
COMPANY SIRRIE ENV. CONS.						

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			73	SAND, VERY FINE TO MEDIUM-GRAINED, DUSKY YELLOW TO GRAYISH ORANGE TO VERY PALE ORANGE, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, WITH CLAY (10-15%), THINLY LAMINATED, SATURATED.	
	12					
7	13			85	CLAY, SANDY (40-45%), DUSKY YELLOW TO GRAYISH ORANGE TO VERY PALE ORANGE, FIRM, THINLY LAMINATED; VERY FINE TO MEDIUM-GRAINED, SUBANGULAR TO SUBROUNDED, TRACE OPAQUES, SATURATED.	
	14					
8	15			83	SAND, GRANULES TO VERY FINE, YELLOWISH GRAY, VERY POORLY SORTED, SUBROUNDED, TRACE OPAQUES, SATURATED.	
	16					
9	17			85	SAME AS ABOVE	
	18					
10	19			83	SAME AS ABOVE	
	20					
					BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-06-88	SHEET 1 OF 1
WELL NO. BSS-20					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 55,815 E 88,311	DRILLER E. BARRON
					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			94	CLAY, SANDY (30-35%), LIGHT BROWN TO MODERATE REDDISH BROWN TO DARK YELLOWISH ORANGE, FIRM, MOTTLED; VERY FINE TO MEDIUM-GRAINED, MODERATELY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	2					
2	3			77	SAME AS ABOVE	
	4					
3	5			85	SAME AS ABOVE	
	6					
4	7			63	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH RED TO MODERATE REDDISH BROWN, MODERATELY SORTED, SUBANGULAR, WITH CLAY (20-25%) TRACE MUSCOVITE, MOIST.	
	8					
5	9			67	SAME AS ABOVE	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-06-88	SHEET 1 OF 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-21					SRP COORDINATES N 53,978 E 89,879	
LOGGED BY R. J. HUNT					DRILLER E. BARRON	
COMPANY SIRRIE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			90	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, SUBANGULAR, TRACE SILT, MOIST.					
2	2			60	SAME AS ABOVE	
	3					
3	4			67	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO MODERATE REDDISH BROWN, MODERATELY SORTED, SUBANGULAR, WITH CLAY (15-20%), TRACE PLINTHITE NODULES, MOTTLED, MOIST.	
	5					
4	6			85	SAME AS ABOVE	
	7					
5	8			79	SAME AS ABOVE, except no plinthite nodules.	
	9					
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-07-88	SHEET 1 OF 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-22					SRP COORDINATES N 51,960 E 89,644	
LOGGED BY R. J. HUNT					DRILLER E. BARRON	
COMPANY SIRRINE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS	
1	1			83	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.		
	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, SUBANGULAR, TRACE SILT, MOIST.						
2	2			67			
	3				SAND, VERY FINE TO VERY COARSE-GRAINED, GRAYISH ORANGE TO DARK YELLOWISH ORANGE, POORLY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, MOIST.		
3	4			83			
	5				SAME AS ABOVE		
4	6			67			
	7				SAME AS ABOVE		
5	8			100			
	9				SAND, VERY FINE TO VERY COARSE-GRAINED, LIGHT BROWN TO GRAYISH ORANGE, POORLY SORTED, SUBANGULAR, WITH CLAY (5-10%), MOIST.		
	10						
					BOTTOM OF EXPLORATION AT 10.0 FT.		

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-07-88	SHEET 1 of 1
WELL NO. BSS-23					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 52,013 E 78,642	DRILLER E. BARRON
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			50	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	SAND, VERY FINE TO MEDIUM-GRAINED, PALE YELLOWISH ORANGE TO GRAYISH ORANGE, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE OPAQUES, MOIST.					
2	2			79	SAME AS ABOVE	
	3					
	4					
3	5			83	SAME AS ABOVE	
	6				SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO MODERATE YELLOWISH BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), MOIST.	
4	7			81		
	8					
5	9			83	SAME AS ABOVE	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-07-88	SHEET 1 OF 2
WELL NO. BSS-24					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 52,622 E 68,514	DRILLER E. BARRON
					COMPANY SIRRIANE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			100	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, SUBANGULAR, TRACE COARSE PEBBLES, TRACE SILT, MOIST.	
2	3			83	CLAY, LIGHT BROWN TO MODERATE REDDISH BROWN TO PALE YELLOWISH ORANGE, FIRM, WITH SAND (5-10%), WITH GRAVEL (5-10%), DRY.	
	4					
3	5			88	SAND, GRANULES TO VERY FINE, DARK YELLOWISH ORANGE TO MODERATE REDDISH BROWN TO GRAYISH PINK, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), TRACE GRAVEL, DRY.	
	6					
4	7			81	SAME AS ABOVE	
	8					
5	9			83	SAME AS ABOVE	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER-PLANT BACKGROUND SOILS STUDY					DATE 09-07-88	SHEET 2 OF 2
WELL NO. BSS-24					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 52,622 E 68,514	DRILLER E. BARRON
					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			88	SAND, VERY FINE TO GRANULES, DARK YELLOWISH ORANGE TO MODERATE REDDISH BROWN TO GRAYISH PINK, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), TRACE GRAVEL, DRY.	
	12					
	13				BOTTOM OF EXPLORATION AT 12.0 FT.	
	14					
	15					
	16					
	17					
	18					
	19					
	20					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-07-88	SHEET 1 of 1
WELL NO. BSS-30					REFERENCE DATUM N34,396 E 83,916	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N34,396 E 83,916	DRILLER E. BARRON
					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			90	SILT, SANDY (35-40%), LIGHT BROWN, SOFT; VERY FINE TO VERY COARSE GRAINED, POORLY SORTED, SUBANGULAR, WITH CLAY (5-10%), TRACE PEBBLES, DRY.	
2	2					
	3			100	SILT, SANDY (35-40%), LIGHT BROWN TO DARK YELLOWISH ORANGE, SOFT, MOTTLED; VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, SUBANGULAR, WITH CLAY (5-10%), TRACE.	
	4					
3	5			71	SAND, GRANULES TO VERY FINE, DARK YELLOWISH ORANGE, VERY POORLY SORTED, SUBANGULAR, WITH SILT (5-10%), MOTTLED, DRY.	
	6					
4	7			81	CLAY, SANDY (40-45%), DARK YELLOWISH ORANGE TO VERY PALE ORANGE, FIRM, MOTTLED; VERY FINE TO VERY COARSE- GRAINED, POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	8					
5	9			75	SAME AS ABOVE	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-08-88	SHEET 1 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-31					SRP COORDINATES N 33,658 E 84,184	
LOGGED BY R. J. HUNT					DRILLER E. BARRON	
COMPANY SIRRINE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			96	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), TRACE ORGANIC MATERIAL, MOIST.	
	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), TRACE ORGANIC MATERIAL, MOTTLED, MOIST.					
2	2			79		
	3					
3	4			83	CLAY, SANDY (35-40%), MODERATE RED TO DARK YELLOWISH ORANGE TO VERY PALE ORANGE, FIRM; GRANULES TO VERY FINE, POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	5				SAME AS ABOVE	
4	6			100		
	7				SAME AS ABOVE	
5	8			92		
	9				SILT, SANDY (40-45%), GRAYISH ORANGE TO LIGHT BROWN, SOFT, MOTTLED; FINE TO MEDIUM-GRAINED, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOTTLED, MOIST.	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-08-88	SHEET 2 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-31					SRP COORDINATES N 33,658 E 84,184	
LOGGED BY R. J. HUNT					DRILLER E. BARRON	
COMPANY SIRRIANE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			96	SILT, SANDY (40-45%), GRAYISH ORANGE TO LIGHT BROWN, SOFT, MOTTLED; VERY FINE TO MEDIUM-GRAINED, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOTTLED, MOIST.	
	12					
7	13			92	SAND, GRANULES TO VERY FINE, MODERATED REDDISH BROWN TO GRAYISH ORANGE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (20-25%), MOTTLED, MOIST.	
	14					
8	15			79	SAND, GRANULES TO VERY FINE, DARK YELLOWISH ORANGE TO MODERATE RED, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (20-25%), MOTTLED, MOIST.	
	16					
9	17			83	SAME AS ABOVE, GRANULES TO VERY FINE, PALE RED PURPLE TO LIGHT BROWNISH GRAY, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (20-25%), MOTTLED MOIST.	
	18					
10	19			88	SAME AS ABOVE	
	20					
					BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-08-88	SHEET 1 OF 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-32					SRP COORDINATES N 34,105 E 87,995	
LOGGED BY R. J. HUNT					DRILLER E. BARRON	
COMPANY SIRRIANE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			92	SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE YELLOWISH BROWN, MODERATELY SORTED, ANGULAR TO SUBROUNDED, TRACE ORGANIC MATERIAL, MOIST.	
	SAND, FINE TO MEDIUM-GRAINED, GRAYISH ORANGE TO PALE YELLOWISH BROWN, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, MOIST.					
2	2			98	SAME AS ABOVE	
	3					
3	4			88		
	5				CLAY, SANDY (35-40%), PALE YELLOWISH BROWN TO LIGHT BROWN, FIRM, MOTTLED; FINE TO MEDIUM-GRAINED, MODERATELY SORTED, ANGULAR TO SUBROUNDED, TRACE PLINTHITE NODULES, MOIST.	
4	6			94		
	7				SAME AS ABOVE	
5	8			79		
	9				SAND, VERY FINE TO MEDIUM-GRAINED, PALE YELLOWISH ORANGE TO LIGHT BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOTTLED, MOIST.	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-14-88	SHEET 1 OF 1
WELL NO. BSS-33					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 37,729 E 89,258	DRILLER J. RENDER
					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			96	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE GRAY, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, TRACE OPAQUES, MOIST.					
2	2			98	SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, TRACE OPAQUES, MOIST.	
	3					
3	4			100	SAME AS ABOVE	
	5					
	6					
4	7			84	SAND, VERY FINE TO COARSE-GRAINED, LIGHT BROWN TO MODERATE REDDISH BROWN TO VERY PALE ORANGE, POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (15-20%), TRACE PLINTHITE NODULES, MOTTLED, MOIST.	
	8					
5	9			77	SAME AS ABOVE	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-13-88	SHEET 1 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-34					SRP COORDINATES N 29,663 E 48,323	
LOGGED BY R. J. HUNT					DRILLER J. RENDER	
COMPANY SIRRIE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			90	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE BROWN, MODERATELY SORTED, SUBANGULAR, WITH SILT (5-10%), MOIST.	
2	3			44	SAND, GRANULES TO VERY FINE, MODERATE REDDISH BROWN, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (20-25%), DRY.	
	4					
3	5			79	SAME AS ABOVE	
	6					
4	7			81	SAND, FINE TO VERY COARSE-GRAINED, DARK YELLOWISH ORANGE TO MODERATE YELLOWISH BROWN, POORLY SORTED, ANGULAR TO SUBANGULAR, WITH COARSE PEBBLES (15-20%), DRY.	
	8					
5	9			NR	NO RECOVERY	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-09-88	SHEET 1 OF 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-35					SRP COORDINATES N 33,348 E 54,468	
LOGGED BY R. J. HUNT					DRILLER E. BARRON	
COMPANY SIRRIE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1				SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE GRAY, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO FINE MEDIUM-GRAINED, LIGHT BROWN, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE OPAQUES, MOIST.	
2	3				SAME AS ABOVE	
	4					
3	5				SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO MODERATE REDDISH BROWN, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, WITH CLAY (5-10%), MOTTLED, MOIST.	
	6					
4	7					
	8					
5	9				SAND, VERY FINE TO VERY COARSE-GRAINED, LIGHT BROWN TO MODERATE REDDISH BROWN, POORLY SORTED, SUBANGULAR TO SUBROUNDED, WITH CLAY (15-20%) MOIST.	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-12-88	SHEET 1 OF 2
WELL NO. BSS-36					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 33,331 E 53,944	DRILLER E. BARRON
					COMPANY SIRRIANE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			71	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, SUBANGULAR TO SUBROUNDED, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
2	2					
	3			100	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBROUNDED, TRACE SILT, MOIST.	
	4					
3	5			79	SAND, GRANULES TO VERY FINE, LIGHT BROWN TO YELLOWISH GRAY TO DARK YELLOWISH ORANGE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (15-20%), MOTTLED, MOIST.	
	6					
4	7			77	SAME AS ABOVE	
	8					
5	9			83	SAND, GRANULES TO VERY FINE, LIGHT BROWN TO YELLOWISH GRAY TO DARK YELLOWISH ORANGE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOTTLED, MOIST.	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-12-88	SHEET 2 OF 2
WELL NO. BSS-36					REFERENCE DATUM N 33,311 E 53,944	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					DRILLER E. BARRON	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)
COMPANY SIRRINE ENV. CONS.						

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			88	SAND, GRANULES TO VERY FINE, LIGHT BROWN TO YELLOWISH GRAY TO DARK YELLOWISH ORANGE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOTTLED, MOIST.	
7	12					
	13			94	SAME AS ABOVE	
8	14					
	15			88	SAND, GRANULES TO VERY FINE, YELLOWISH GRAY TO LIGHT BROWN TO DARK YELLOWISH ORANGE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (20-25%), MOTTLED, MOIST.	
9	16					
	17			54	SAME AS ABOVE	
10	18					
	19			85	SAME AS ABOVE	
	20					
					BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-15-88	SHEET 1 OF 2
WELL NO. BSS-40					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 85,680 E 40,440	DRILLER J. RENDER
					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			88	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2					
2	3			50	SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE REDDISH BROWN, MODERATELY SORTED, SUBANGULAR, WITH CLAY (5-10%), MOIST. CLAY, SANDY (40-45%), MODERATE REDDISH BROWN, HARD; VERY FINE TO MEDIUM- GRAINED, MODERATELY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	4					
3	5			84	CLAY, SANDY (40-45%), MODERATE REDDISH BROWN, HARD; VERY FINE TO MEDIUM- GRAINED, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE GRANULES, MOIST.	
	6					
4	7			92	CLAY, SANDY (40-45%), MODERATE REDDISH BROWN, HARD; GRANULES TO VERY FINE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	8					
5	9			94	SAME AS ABOVE	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-15-88	SHEET 2 OF 2
WELL NO. BSS-40					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 85,680 E 40,440	DRILLER J. F. ENDER
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			84	CLAY, SANDY(40-45%), MODERATE REDDISH BROWN TO DARK YELLOWISH ORANGE, HARD, MOTTLED; GRANULES TO VERY FINE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	12					
7	13			75	CLAY, SANDY (40-45%), LIGHT BROWN TO GRAYISH PURPLE, HARD; GRANULES TO VERY FINE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, TRACE MUSCOVITE, MOIST.	
	14					
8	15			63	SAME AS ABOVE	
	16					
9	17			92	SAME AS ABOVE	
	18					
10	19			90	SAME AS ABOVE	
	20					
					BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-14-88	SHEET 1 OF 2
WELL NO. BSS-41					REFERENCE DATUM N 84,253 E 35,616	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 84,253 E 35,616	DRILLER J. RENDER
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			83	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE GRAY, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, MOIST.	
2	3			81	SAME AS ABOVE	
	4					
3	5			79	SAME AS ABOVE	
	6					
4	7			81	SAND, VERY FINE TO MEDIUM-GRAINED, VERY PALE ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	8					
5	9			88	SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE TO LIGHT BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOTTLED, MOIST.	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-14-88	SHEET 2 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-41					SRP COORDINATES N 84,253 E 35,616	
LOGGED BY R. J. HUNT					DRILLER J. RENDER	
COMPANY SIRRINE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			88	SAME AS ABOVE	
					CLAY, SANDY (35-40%), LIGHT BROWN, HARD; GRANULES TO VERY FINE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
7	13			96	SAME AS ABOVE	
8	15			96	SAME AS ABOVE	
9	17			94	SAND, GRANULES TO VERY FINE, LIGHT BROWN TO MODERATE REDDISH BROWN, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
10	19			92	SAND, GRANULES TO VERY FINE, LIGHT BROWN TO MODERATE REDDISH BROWN, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), THINLY LAMINATED, MOIST.	
	20					
BOTTOM OF EXPLORATION AT 20.0 FT.						

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-20-88	SHEET 1 of 1
WELL NO. BSS-42					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 87,219 E 37,347	DRILLER J. RENDER
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			92	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, YELLOWISH GRAY, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, MOIST.	
2	3			85		
	4				CLAY, SANDY (40-45%), MODERATE REDDISH BROWN TO LIGHT BROWN, FIRM, MOTTLED; VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, SUBANGULAR, TRACE COARSE PEBBLES, TRACE PLINTHITE NODULES, MOIST.	
3	5			67		
	6					
4	7			71	CLAY, SANDY (40-45%), MODERATE REDDISH BROWN TO LIGHT BROWN TO VERY PALE ORANGE, FIRM, MOTTLED; VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	8					
5	9			63	SAME AS ABOVE	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-23-88	SHEET 1 OF 1
WELL NO. BSS-43					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 92,268 E 40,436	DRILLER C. BARRON
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			83	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	SAND, VERY FINE TO MEDIUM-GRAINED, YELLOWISH GRAY, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, MOIST.					
2	2			79	SAME AS ABOVE	
	3					
	4					
3	5			96	SAME AS ABOVE SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, MOIST.	
	6				CLAY, SANDY (35-40%), MODERATE REDDISH BROWN TO DARK YELLOWISH ORANGE, FIRM, MOTTLED; VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
4	7			96		
	8					
5	9			94	SAME AS ABOVE	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-19-88	SHEET 1 OF 1
WELL NO. BSS-44					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 103,665 E 74,473	DRILLER J. RENDER
					COMPANY SIRRIANE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			92	SAND, VERY FINE TO MEDIUM-GRAINED. OLIVE BLACK. MODERATELY SORTED. ANGULAR TO SUBANGULAR. TRACE SILT. TRACE ORGANIC MATERIAL. MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, YELLOWISH GRAY, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, MOIST.	
2	3			98	CLAY, SANDY (40-45%), MODERATE REDDISH BROWN TO DARK YELLOWISH ORANGE TO YELLOWISH GRAY, FIRM, MOTTLED; VERY FINE TO VERY COARSE-GRAINED, MODERATELY SORTED, SUBANGULAR, MOIST.	
3	5			96	SAME AS ABOVE	
4	7			90	SAME AS ABOVE	
5	9			83	SAME AS ABOVE, except no plinthite nodules.	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-19-88	SHEET 1 OF 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-45					SRP COORDINATES N 105,482 E 73,220	
LOGGED BY R. J. HUNT					DRILLER J. RENDER	
COMPANY SIRRINE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			88	SAND, FINE-GRAINED, OLIVE BLACK, WELL SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
					SAND, FINE-GRAINED, YELLOWISH GRAY, WELL SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, MOIST.	
2	2			94	SAME AS ABOVE	
3	3			83	CLAY, SANDY (35-40%), MODERATE REDDISH BROWN, FIRM; VERY FINE TO VERY COARSE- GRAINED, POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
4	4			81	SAME AS ABOVE	
5	5			88	SAME AS ABOVE	
6	6			88	SAME AS ABOVE	
7	7			88	SAME AS ABOVE	
8	8			88	SAME AS ABOVE	
9	9			88	SAME AS ABOVE	
10	10			88	SAME AS ABOVE	
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-16-88	SHEET 1 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-46					SRP COORDINATES N 93,938 E 65,113	
LOGGED BY R. J. HUNT					DRILLER J. RENDER	
COMPANY SIRRINE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			83	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), MOIST.	
2	3			75	CLAY, SANDY (40-45%), LIGHT BROWN TO MODERATE REDDISH BROWN, FIRM; VERY FINE TO MEDIUM-GRAINED, MODERATELY SORTED, SUBANGULAR, MOIST.	
	4					
3	5			83	SAME AS ABOVE	
	6					
4	7			54	CLAY, SANDY (40-45%), LIGHT BROWN TO DARK YELLOWISH ORANGE, FIRM, MOTTLED; GRANULES TO VERY FINE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, DRY.	
	8					
5	9			100	CLAY, SANDY (35-40%), LIGHT BROWN TO DARK YELLOWISH ORANGE TO VERY PALE ORANGE, FIRM; GRANULES TO VERY FINE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, TRACE PLINTHITE NODULES, MOIST.	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-16-88	SHEET 2 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-46					SRP COORDINATES N 93,938 E 65,113	
LOGGED BY R. J. HUNT					DRILLER J. RENDER	
COMPANY SIRRIANE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			71	CLAY, SANDY(35-40%). LIGHT BROWN TO DARK YELLOWISH ORANGE TO VERY PALE ORANGE. FIRM; GRANULES TO VERY FINE, VERY POORLY SORTED. ANGULAR TO SUBANGULAR. TRACE PLINTHITE NODULES. MOIST.	
7	12			88		
	13				CLAY, SANDY(35-40%). LIGHT BROWN TO GRAYISH ORANGE. FIRM, MOTTLED; VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
8	14			92		
	15				CLAY, LIGHT BROWN TO PALE YELLOWISH ORANGE TO LIGHT BLuish GRAY, FIRM, THINLY LAMINATED (DISTORTED), TRACE SAND, TRACE MUSCOVITE, MOIST.	
9	16			90		
	17				SAME AS ABOVE	
10	18			96		
	19				SAME AS ABOVE	
	20					
					BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-21-88	SHEET 1 OF 2
WELL NO. BSS-47					REFERENCE DATUM N 24,350 E 52,465	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 24,350 E 52,465	DRILLER E. BARRON
					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			88	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	CLAY, SANDY (40-45%), LIGHT BROWN TO MODERATE REDDISH BROWN, FIRM; VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.					
2	2			94	SAND, VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), MOIST	
	3					
3	4			79	SAME AS ABOVE	
	5					
4	6			84	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
	7					
5	8			86	SAME AS ABOVE	
	9					
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-21-88	SHEET 2 OF 2
WELL NO. BSS-47					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 24,350 E 52,465	DRILLER E. BARRON
					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			77	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, CLAY (5-10%), MOIST.	
7	12			84	SAND, VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, ANGULAR TO SUBANGULAR, CLAY (5-10%), MOIST.	
8	13			94		
9	14			100		
10	15			94	SAND, GRANULES TO VERY FINE, MODERATE YELLOW TO DARK YELLOWISH ORANGE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), TRACE MUSCOVITE, THINLY LAMINATED, MOIST.	
10	16			100		
10	17			100	SAND, GRANULES TO VERY FINE, PALE ORANGE TO DARK YELLOWISH ORANGE TO GRAYISH RED PURPLE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), TRACE MUSCOVITE, FAINT LAMINATIONS, MOIST.	
10	18			100		
10	19			100	SAME AS ABOVE	
10	20			100		
					BO TOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-21-88	SHEET 1 OF 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-48					SRP COORDINATES N 23,016 E 51,477	
LOGGED BY R. J. HUNT					DRILLER E. BARRON	
COMPANY SIRRINE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			83	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE OPAQUES, MOIST.	
2	3			75	SAME AS ABOVE	
	4					
3	5			88	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE OPAQUES, THINLY LAMINATED, MOIST.	
	6					
4	7			85	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE OPAQUES, THINLY LAMINATED, MOIST.	
	8					
5	9			79	SAME AS ABOVE	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-21-88	SHEET 1 OF 1
WELL NO. BSS-49					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 22,770 E 53,381	DRILLER E. BARRON
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			94	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
2	2					
	3			96	SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE OPAQUES, MOIST.	
	4					
3	5			77	CLAY, SANDY (35-40%), LIGHT BROWN TO MODERATE REDDISH BROWN, HARD, MOTTLED; VERY FINE TO VERY COARSE- GRAINED, POORLY SORTED, ANGULAR TO SUBANGULAR, TRACE PLINTHITE NODULES, M. MOIST.	
	6					
4	7			81	SAME AS ABOVE	
	8					
5	9			88	SAME AS ABOVE, except no plinthite nodules.	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-19-88	SHEET 1 OF 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-50					SRP COORDINATES N 91,416 E 45,717	
LOGGED BY R. J. HUNT					DRILLER J. RENDER	
COMPANY SIRRINE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS	
1	1			98	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.		
	SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE REDDISH BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH SILT (5-10%), MOIST.						
2	3			92	CLAY, SANDY (40-45%), MODERATE REDDISH BROWN, HARD; VERY FINE TO MEDIUM-GRAINED, MODERATELY SORTED, ANGULAR TO SUBANGULAR, MOIST.		
	4						
3	5			83	SAME AS ABOVE		
	6						
4	7			79	SAME AS ABOVE		
	8						
5	9			71	SAME AS ABOVE		
	10						
					BOTTOM OF EXPLORATION AT 10.0 FT.		

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-19-88	SHEET 1 OF 2
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-51					SRP COORDINATES N 107,468 E 79,970	DRILLER J. RENDER
LOGGED BY R. J. HUNT					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			85	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE TO MODERATE YELLOWISH BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, MOIST	
2	3			40	SAME AS ABOVE	
	4					
3	5			92	SAND, VERY FINE TO MEDIUM-GRAINED, VERY PALE ORANGE TO PALE YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, MOIST.	
	6					
4	7			94	SAND, VERY FINE TO MEDIUM-GRAINED, PALE YELLOWISH ORANGE TO GRAYISH ORANGE, MODERATELY SORTED, ANGULAR, TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
	8					
5	9			83	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (15-20%), MOTTLED, MOIST.	
	10					

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-19-88	SHEET 2 OF 2
WELL NO. BSS-51					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 107,468 E 79,970	DRILLER J. RENDER
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
6	11			83	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO PALE RED PURPLE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
	12					
7	13			85	SAME AS ABOVE	
	14					
8	15			83	SAND, GRANULES TO VERY FINE, LIGHT BROWN TO PALE RED PURPLE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
	16				SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), TRACE COARSE PEBBLES, MOIST.	
9	17			81		
	18					
10	19			83	SAND, GRANULES TO VERY FINE, DARK YELLOWISH ORANGE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), TRACE COARSE PEBBLES, THINLY LAMINATED, MOIST.	
	20					
					BOTTOM OF EXPLORATION AT 20.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-20-88	SHEET 1 OF 1																																																																										
WELL NO. BSS-52					REFERENCE DATUM N 88,820 E 107,440	DRILLING CONTRACTOR MONITOR TESTING CO.																																																																										
LOGGED BY R. J. HUNT					DRILLER J. RENDER	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)																																																																										
<table border="1"> <thead> <tr> <th>RUN NUMBER</th> <th>DEPTH, FEET</th> <th>LITHOLOGY</th> <th>OVA (PPM) READINGS</th> <th>PERCENT RECOVERY</th> <th>SAMPLE DESCRIPTION</th> <th>DRILLING COMMENTS</th> </tr> </thead> <tbody> <tr> <td rowspan="2">1</td> <td>1</td> <td></td> <td></td> <td rowspan="2">75</td> <td>SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.</td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.</td> <td></td> </tr> <tr> <td rowspan="2">2</td> <td>3</td> <td></td> <td></td> <td rowspan="2">81</td> <td>SAME AS ABOVE</td> <td></td> </tr> <tr> <td>4</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td rowspan="2">3</td> <td>5</td> <td></td> <td></td> <td rowspan="2">85</td> <td>SAND, VERY FINE TO MEDIUM-GRAINED, VERY PALE ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.</td> <td></td> </tr> <tr> <td>6</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td rowspan="2">4</td> <td>7</td> <td></td> <td></td> <td rowspan="2">88</td> <td>SAME AS ABOVE</td> <td></td> </tr> <tr> <td>8</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td rowspan="2">5</td> <td>9</td> <td></td> <td></td> <td rowspan="2">71</td> <td>SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.</td> <td></td> </tr> <tr> <td>10</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="5"></td> <td>BOTTOM OF EXPLORATION AT 10.0 FT.</td> <td></td> </tr> </tbody> </table>							RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS	1	1			75	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.		2			SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.		2	3			81	SAME AS ABOVE		4					3	5			85	SAND, VERY FINE TO MEDIUM-GRAINED, VERY PALE ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.		6					4	7			88	SAME AS ABOVE		8					5	9			71	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.		10										BOTTOM OF EXPLORATION AT 10.0 FT.	
RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS																																																																										
1	1			75	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.																																																																											
	2				SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.																																																																											
2	3			81	SAME AS ABOVE																																																																											
	4																																																																															
3	5			85	SAND, VERY FINE TO MEDIUM-GRAINED, VERY PALE ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.																																																																											
	6																																																																															
4	7			88	SAME AS ABOVE																																																																											
	8																																																																															
5	9			71	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.																																																																											
	10																																																																															
					BOTTOM OF EXPLORATION AT 10.0 FT.																																																																											

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-20-88	SHEET 1 OF 1
WELL NO. BSS-52					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 88,820 E 107,440	DRILLER J. RENDER
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			75	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, GRAYISH ORANGE TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.	
2	3			81	SAME AS ABOVE	
	4					
3	5			85	SAND, VERY FINE TO MEDIUM-GRAINED, VERY PALE ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.	
	6					
4	7			88	SAME AS ABOVE	
	8					
5	9			71	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN TO DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE CLAY, MOIST.	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-22-88	SHEET 1 OF 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-54					SRP COORDINATES N 108,583 E 55,457	DRILLER E. BARRON
LOGGED BY R. J. HUNT					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			92	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE YELLOWISH BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, MOIST.	
2	3			83	CLAY, SANDY (40-45%), LIGHT BROWN, FIRM; VERY FINE TO MEDIUM GRAINED, MODERATELY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	4					
3	5			90	SAME AS ABOVE	
	6					
4	7			100	SAND, VERY FINE TO VERY COARSE-GRAINED, DARK YELLOWISH ORANGE, POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (20-25%), MOIST.	
	8					
5	9			96	CLAY, SANDY (40-45%), LIGHT BROWN, FIRM; GRANULES TO VERY FINE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-23-88	SHEET 1 OF 1
WELL NO. BSS-55					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SRP COORDINATES N 77,592 E 49,801	DRILLER E. BARRON
					COMPANY SIRRIE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			83	SAND, GRANULES TO VERY FINE, LIGHT BROWN, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (15-20%), TRACE COARSE PEBBLES, MOIST.	
2	2					
2	3			100	SAME AS ABOVE	
3	4					
3	5			100	SAME AS ABOVE	
4	6					
4	7			75	SAND, GRANULES TO VERY FINE, LIGHT BROWN TO GRAYISH ORANGE, VERY POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
5	8					
5	9			88	SAME AS ABOVE	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-20-88	SHEET 1 OF 1
WELL NO. BSS-56					REFERENCE DATUM	DRILLING CONTRACTOR MONITOR TESTING CO.
LOGGED BY R. J. HUNT					SAP COORDINATES N 71,752 E 37,622	DRILLER J. RENDER
					COMPANY SIRRINE ENV. CONS.	DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			71	SAND, VERY FINE-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, DARK YELLOWISH ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
2	3			90	SAME AS ABOVE	
	4					
3	5			92	SAND, VERY FINE TO MEDIUM-GRAINED, VERY PALE ORANGE, MODERATELY SORTED, ANGULAR TO SUBANGULAR, MOIST.	
	6					
4	7			100	SAME AS ABOVE	
	8					
5	9			98	SAND, VERY FINE TO MEDIUM-GRAINED, LIGHT BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), MOIST.	
	10				BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-26-88	SHEET 1 OF 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-57					SRP COORDINATES N 35,691 E 19,734	
LOGGED BY R. J. HUNT					DRILLER E. BARRON	
COMPANY SIRRINE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			81	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	2				SAND, VERY FINE TO MEDIUM-GRAINED, MODERATE BROWN, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, MOIST.	
2	3			71	SAME AS ABOVE	
	4					
3	5			88	SAME AS ABOVE	
	6					
4	7			85	SAME AS ABOVE	
	8					
5	9			79	SAME AS ABOVE	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-26-88	SHEET 1 of 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-58					SRP COORDINATES N 43,993 E 33,304	
LOGGED BY R. J. HUNT					DRILLER E. BARRON	
					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	
RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			100	PEBBLES, SANDY (30-35%), LIGHT BROWN TO MODERATE YELLOWISH BROWN, FINE TO MEDIUM PEBBLES, ROUNDED; VERY FINE TO COARSE-GRAINED SAND, POORLY SORTED; SUBANGULAR TO SUBROUNDED, WITH CLAY (15-20%), MOIST.	
2	2					
2	3			88	SAME AS ABOVE	
3	4					
3	5			85	SAME AS ABOVE	
4	6					
4	7			67	SAME AS ABOVE	
5	8					
5	9			77	SAME AS ABOVE	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

FIELD GEOLOGIC LOG

PROJECT SAVANNAH RIVER PLANT BACKGROUND SOILS STUDY					DATE 09-27-88	SHEET 1 OF 1
REFERENCE DATUM					DRILLING CONTRACTOR MONITOR TESTING CO.	
WELL NO. BSS-59					SRP COORDINATES N 40,335 E 46,585	
LOGGED BY R. J. HUNT					DRILLER E. BARRON	
COMPANY SIRRINE ENV. CONS.					DRILLING METHOD AUGER (HSA-3 1/4 IN. ID)	

RUN NUMBER	DEPTH, FEET	LITHOLOGY	OVA (PPM) READINGS	PERCENT RECOVERY	SAMPLE DESCRIPTION	DRILLING COMMENTS
1	1			92	SAND, VERY FINE TO MEDIUM-GRAINED, OLIVE BLACK, MODERATELY SORTED, ANGULAR TO SUBANGULAR, TRACE SILT, TRACE ORGANIC MATERIAL, MOIST.	
	CLAY, SANDY (30-35%), PALE YELLOWISH ORANGE TO LIGHT BROWN, FIRM; VERY FINE TO VERY COARSE-GRAINED, POORLY SORTED, ANGULAR TO SUBANGULAR, TRACE MUSCOVITE, MOIST.					
2	2			100	SAME AS ABOVE	
	3					
	4					
3	5			85	SAND, VERY FINE TO VERY COARSE-GRAINED, LIGHT BROWN, POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), 1 ST.	
	6					
4	7			71	SAND, VERY FINE TO VERY COARSE-GRAINED, LIGHT BROWN TO VERY PALE ORANGE TO GRAYISH PURPLE, POORLY SORTED, ANGULAR TO SUBANGULAR, WITH CLAY (5-10%), THINLY LAMINATED, MOIST.	
	8					
5	9			77	SAME AS ABOVE	
	10					
					BOTTOM OF EXPLORATION AT 10.0 FT.	

**GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND
SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE**

Appendix C.1

Metal Data Summary

Blanton Soil Series

Aluminum

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		715
BSS-061	0 - 6		1476
BSS-091	0 - 5		4150
BSS-231	0 - 7		2509
BSS-331	0 - 8		2075
BSS-351	0 - 7		21200
BSS-431	0 - 6		2485.7
BSS-451	0 - 5		2358.4
Second Layer			
BSS-012	10 - 65		842
BSS-062	6 - 50		17450
BSS-092A	5 - 52		4520
BSS-232	7 - 61		19510
BSS-332	8 - 72		7271.4
BSS-352	7 - 60		14020
BSS-432	6 - 67		2426.8
BSS-452	5 - 59		3366.2
Third Layer			
BSS-013	65 - 87		2550
BSS-063	50 - 74		13390
BSS-093A	52 - 72		18400
BSS-233	61 - 70		7534
BSS-333	72 - 84		16370
BSS-353	60 - 72		20010
BSS-433	67 - 77		12527
BSS-453	59 - 72		27512
Fourth Layer			
BSS-014	111 - 124		1969
BSS-064	96 - 120		9016
BSS-094A	96 - 120		7140
BSS-234	96 - 120		6614
BSS-334	96 - 120		14593
BSS-354	96 - 120		5213
BSS-434	96 - 120		10083
BSS-454	96 - 120		10540

Blanton Soil Series

Arsenic

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	0.5
BSS-061	0 - 6	LT	0.5
BSS-091	0 - 5		0.73
BSS-231	0 - 7	LT	1
BSS-331	0 - 8	LT	2
BSS-351	0 - 7		1.07
BSS-431	0 - 6	LT	2
BSS-451	0 - 5	LT	2
Second Layer			
BSS-012	10 - 65	LT	0.5
BSS-062	6 - 50		1.28
BSS-092A	5 - 52		0.79
BSS-232	7 - 61	LT	1
BSS-332	8 - 72	LT	2
BSS-352	7 - 60		1.33
BSS-432	6 - 67	LT	2
BSS-452	5 - 59	LT	2
Third Layer			
BSS-013	65 - 87	LT	0.5
BSS-063	50 - 74		2.71
BSS-093A	52 - 72		5.29
BSS-233	61 - 70		1.11
BSS-333	72 - 84	LT	2
BSS-353	60 - 72		7.05
BSS-433	67 - 77	LT	2
BSS-453	39 - 72		2.8
Fourth Layer			
BSS-014	111 - 124	LT	0.5
BSS-064	96 - 120		1.89
BSS-094A	96 - 120		6.18
BSS-234	96 - 120		1.61
BSS-334	96 - 120	LT	2
BSS-354	96 - 120		5.33
BSS-434	96 - 120		3.6
BSS-454	96 - 120		2.2

Blanton Soil Series

Barium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		2.8
BSS-061	0 - 6		5.35
BSS-091	0 - 5		25.4
BSS-231	0 - 7		7.683
BSS-331	0 - 8		11.6
BSS-351	0 - 7		21.99
BSS-431	0 - 6		10.4
BSS-451	0 - 5		7.6
Second Layer			
BSS-012	10 - 65		3
BSS-062	6 - 50		30.7
BSS-092A	5 - 52		14
BSS-232	7 - 61	LT	8.9
BSS-332	8 - 72		31.6
BSS-352	7 - 60		9.119
BSS-432	6 - 67		12.6
BSS-452	5 - 59		11.6
Third Layer			
BSS-013	65 - 87		6.4
BSS-063	50 - 74		10.6
BSS-093A	52 - 72		7.6
BSS-233	61 - 70		6.683
BSS-333	72 - 84		18
BSS-353	60 - 72		13.55
BSS-433	67 - 77		25.9
BSS-453	59 - 72		25.2
Fourth Layer			
BSS-014	111 - 124		4.6
BSS-064	96 - 120		6.06
BSS-094A	96 - 120		2.4
BSS-234	96 - 120		4.435
BSS-334	96 - 120		13.6
BSS-354	96 - 120		11.92
BSS-434	96 - 120		10.5
BSS-454	96 - 120		9.2

Blanton Soil Series

Cadmium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	0.5
BSS-061	0 - 6	LT	0.5
BSS-091	0 - 5	LT	1
BSS-231	0 - 7	LT	1
BSS-331	0 - 8	LT	0.6
BSS-351	0 - 7		0.9282
BSS-431	0 - 6	LT	0.6
BSS-451	0 - 5	LT	0.6
Second Layer			
BSS-012	10 - 65	LT	0.5
BSS-062	6 - 50	LT	0.5
BSS-092A	5 - 52	LT	1
BSS-232	7 - 61	LT	1
BSS-332	8 - 72	LT	0.6
BSS-352	7 - 60		0.8619
BSS-432	6 - 67	LT	0.6
BSS-452	5 - 59	LT	0.6
Third Layer			
BSS-013	65 - 87	LT	0.5
BSS-063	50 - 74	LT	0.5
BSS-093A	52 - 72	LT	0.6
BSS-233	61 - 70		0.9945
BSS-333	72 - 84	LT	0.6
BSS-353	60 - 72		0.5304
BSS-433	67 - 77	LT	0.6
BSS-453	59 - 72	LT	0.6
Fourth Layer			
BSS-014	111 - 124	LT	0.5
BSS-064	96 - 120	LT	0.5
BSS-094A	96 - 120	LT	1
BSS-234	96 - 120		0.2652
BSS-334	96 - 120	LT	0.6
BSS-354	96 - 120		0.3978
BSS-434	96 - 120	LT	0.6
BSS-454	96 - 120	LT	0.6

Blanton Soil Series

Chromium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		1.7
BSS-061	0 - 6		2.18
BSS-091	0 - 5		12.2
BSS-231	0 - 7		4.388
BSS-331	0 - 8		2.8
BSS-351	0 - 7		27.97
BSS-431	0 - 6		3.3
BSS-451	0 - 5		8.2
Second Layer			
BSS-012	10 - 65		1.8
BSS-062	6 - 50		11.9
BSS-092A	5 - 52		8.4
BSS-232	7 - 61		4.3
BSS-332	8 - 72		6.4
BSS-352	7 - 60		24.54
BSS-432	6 - 67		3.1
BSS-452	5 - 59		4.6
Third Layer			
BSS-013	65 - 87		3.1
BSS-063	50 - 74		14.8
BSS-093A	52 - 72		23.4
BSS-233	61 - 70		8.09
BSS-333	72 - 84		16.2
BSS-353	60 - 72		31.54
BSS-433	67 - 77		21.4
BSS-453	59 - 72		32.6
Fourth Layer			
BSS-014	111 - 124		3.4
BSS-064	96 - 120		13.1
BSS-094A	96 - 120		17.6
BSS-234	96 - 120		7.953
BSS-334	96 - 120		15
BSS-354	96 - 120		6.307
BSS-434	96 - 120		35.2
BSS-454	96 - 120		15

Blanton Soil Series

Copper

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		0.57
BSS-061	0 - 6		0.36
BSS-091	0 - 5		2.26
BSS-231	0 - 7		1.985
BSS-331	0 - 8		2
BSS-351	0 - 7		7.009
BSS-431	0 - 6		1.3
BSS-451	0 - 5		2.4
Second Layer			
BSS-012	10 - 65		0.57
BSS-062	6 - 50		2.71
BSS-092A	5 - 52		2.02
BSS-232	7 - 61	LT	0.6
BSS-332	8 - 72		2.6
BSS-352	7 - 60		6.147
BSS-432	6 - 67		1
BSS-452	5 - 59		1.8
Third Layer			
BSS-013	65 - 87		0.5
BSS-063	50 - 74		2.78
BSS-093A	52 - 72		6.4
BSS-233	61 - 70		2.872
BSS-333	72 - 84		6
BSS-353	60 - 72		7.615
BSS-433	67 - 77		5
BSS-453	59 - 72		8.2
Fourth Layer			
BSS-014	111 - 124		1
BSS-064	96 - 120		1.42
BSS-094A	96 - 120		2.6
BSS-234	96 - 120		2.834
BSS-334	96 - 120		4.8
BSS-354	96 - 120		2.475
BSS-434	96 - 120		5.4
BSS-454	96 - 120		4.6

Blanton Soil Series

Iron

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		1200
BSS-061	0 - 6		1272
BSS-091	0 - 5		1930
BSS-231	0 - 7		1409
BSS-331	0 - 8		1334.2
BSS-351	0 - 7		21650
BSS-431	0 - 6		1446.9
BSS-451	0 - 5		1423
Second Layer			
BSS-012	10 - 65		1954
BSS-062	6 - 50		17080
BSS-092A	5 - 52		2020
BSS-232	7 - 61		3390
BSS-332	7 - 72		4778.2
BSS-352	7 - 60		19390
BSS-432	6 - 67		1807.7
BSS-452	5 - 59		2342.2
Third Layer			
BSS-013	65 - 87		4380
BSS-063	50 - 74		32800
BSS-093A	52 - 72		19860
BSS-233	61 - 70		3982
BSS-333	72 - 84		9749.4
BSS-353	60 - 72		37740
BSS-433	67 - 77		14951
BSS-453	59 - 72		32926
Fourth Layer			
BSS-014	111 - 124		2700
BSS-064	96 - 120		22200
BSS-094A	96 - 120		7600
BSS-234	96 - 120		3509
BSS-334	96 - 120		6968.8
BSS-354	96 - 120		3279
BSS-434	96 - 120		31855
BSS-454	96 - 120		13694

Blanton Soil Series

Lead

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		0.68
BSS-061	0 - 6		6.08
BSS-091	0 - 5		6.45
BSS-231	0 - 7		2.21
BSS-331	0 - 8		4.5
BSS-351	0 - 7		6.04
BSS-431	0 - 6		3.9
BSS-451	0 - 5		4.9
Second Layer			
BSS-012	10 - 65		0.6
BSS-062	6 - 50		2.91
BSS-092A	5 - 52		3.45
BSS-232	7 - 61		2.13
BSS-332	8 - 72		3.1
BSS-352	7 - 60		4.57
BSS-432	6 - 67	LT	1
BSS-452	5 - 59		1.7
Third Layer			
BSS-013	65 - 87		0.72
BSS-063	50 - 74		3.71
BSS-093A	52 - 72		6.54
BSS-233	61 - 70		2.09
BSS-333	72 - 84		5.1
BSS-353	60 - 72		3.8
BSS-433	67 - 77		4.4
BSS-453	59 - 72		7.2
Fourth Layer			
BSS-014	111 - 124		0.79
BSS-064	96 - 120		5.6
BSS-094A	96 - 120		7.84
BSS-234	96 - 120		2.16
BSS-334	96 - 120		5
BSS-354	96 - 120		5.56
BSS-434	96 - 120		6
BSS-454	96 - 120		4.3

Blanton Soil Series

Lithium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	10
BSS-061	0 - 6	LT	10
BSS-091	0 - 5	LT	10
BSS-231	0 - 7	LT	10
BSS-331	0 - 8	LT	10
BSS-351	0 - 7	LT	10
BSS-431	0 - 6	LT	10
BSS-451	0 - 5	LT	10
Second Layer			
BSS-012	10 - 65	LT	10
BSS-062	6 - 50	LT	10
BSS-092A	5 - 52	LT	10
BSS-232	7 - 61	LT	10
BSS-332	8 - 72	LT	10
BSS-352	7 - 60	LT	10
BSS-432	6 - 67	LT	10
BSS-452	5 - 59	LT	10
Third Layer			
BSS-013	65 - 87	LT	10
BSS-063	50 - 74	LT	10
BSS-093A	52 - 72	LT	10
BSS-233	61 - 70	LT	10
BSS-333	72 - 84	LT	10
BSS-353	60 - 72	LT	10
BSS-433	67 - 77	LT	10
BSS-453	59 - 72	LT	10
Fourth Layer			
BSS-014	111 - 124	LT	10
BSS-064	96 - 120	LT	10
BSS-094A	96 - 120	LT	10
BSS-234	96 - 120	LT	10
BSS-334	96 - 120	LT	10
BSS-354	96 - 120	LT	10
BSS-434	96 - 120	LT	10
BSS-454	96 - 120	LT	10

Blanton Soil Series

Magnesium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		20.09
BSS-061	0 - 6		42.4
BSS-091	0 - 5		117.4
BSS-231	0 - 7		69.17
BSS-331	0 - 8		86.18
BSS-351	0 - 7		107
BSS-431	0 - 6		34.65
BSS-451	0 - 5		54.78
Second Layer			
BSS-012	10 - 65		25.94
BSS-062	6 - 50		188.5
BSS-092A	5 - 52		123.8
BSS-232	7 - 61		167.1
BSS-332	8 - 72		100
BSS-352	7 - 60		232.9
BSS-432	6 - 67		91.71
BSS-452	5 - 59		79.54
Third Layer			
BSS-013	65 - 87		45.55
BSS-063	50 - 74		112.7
BSS-093A	52 - 72		101
BSS-233	61 - 70		73.32
BSS-333	72 - 84		135.4
BSS-353	60 - 72		296.7
BSS-433	67 - 77		121.1
BSS-453	59 - 72		185.9
Fourth Layer			
BSS-014	111 - 124		163.5
BSS-064	96 - 120		62.11
BSS-094A	96 - 120		43.23
BSS-234	96 - 120		48.07
BSS-334	96 - 120		75.53
BSS-354	96 - 120		108.4
BSS-434	96 - 120		137.2
BSS-454	96 - 120		76.64

Blanton Soil Series

Manganese

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		12.72
BSS-061	0 - 6		22.79
BSS-091	0 - 5		138.5
BSS-231	0 - 7		18.46
BSS-331	0 - 8		30.56
BSS-351	0 - 7		70.93
BSS-431	0 - 6		32.25
BSS-451	0 - 5		15.47
Second Layer			
BSS-012	10 - 65		3.409
BSS-062	6 - 50		13.83
BSS-092A	5 - 52		27.05
BSS-232	7 - 61		11.41
BSS-332	8 - 72		9.268
BSS-352	7 - 60		30.56
BSS-432	6 - 67		12.64
BSS-452	5 - 59		4.29
Third Layer			
BSS-013	65 - 87		3.983
BSS-063	50 - 74		2.834
BSS-093A	52 - 72		15.28
BSS-233	61 - 70		1.762
BSS-333	72 - 84	LT	1.6
BSS-353	60 - 72		2.451
BSS-433	67 - 77		3.294
BSS-453	59 - 72	LT	1.6
Fourth Layer			
BSS-014	111 - 124		2.758
BSS-064	96 - 120		3.485
BSS-094A	96 - 120		12.12
BSS-234	96 - 120		2.298
BSS-334	96 - 120	LT	1.6
BSS-354	96 - 120		2.528
BSS-434	96 - 120		3.37
BSS-454	96 - 120		2.375

Blanton Soil Series

Mercury

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	0.1
BSS-061	0 - 6	LT	0.1
BSS-091	0 - 5		0.19
BSS-231	0 - 7	LT	0.1
BSS-331	0 - 8	LT	0.1
BSS-351	0 - 7	LT	0.1
BSS-431	0 - 6	LT	0.1
BSS-451	0 - 5	LT	0.1
Second Layer			
BSS-012	10 - 65	LT	0.1
BSS-062	6 - 50		0.1
BSS-092A	5 - 52		0.14
BSS-232	7 - 61	LT	0.1
BSS-332	8 - 72	LT	0.1
BSS-352	7 - 60	LT	0.1
BSS-432	6 - 67		0.15
BSS-452	5 - 59	LT	0.1
Third Layer			
BSS-013	65 - 87	LT	0.1
BSS-063	50 - 74	LT	0.1
BSS-093A	52 - 72		0.25
BSS-233	61 - 70	LT	0.1
BSS-333	72 - 84	LT	0.1
BSS-353	60 - 72	LT	0.1
BSS-433	67 - 77	LT	0.1
BSS-453	59 - 72	LT	0.1
Fourth Layer			
BSS-014	111 - 124	LT	0.1
BSS-064	96 - 120		0.13
BSS-094A	96 - 120		0.15
BSS-234	96 - 120	LT	0.1
BSS-334	96 - 120	LT	0.1
BSS-354	96 - 120		0.19
BSS-434	96 - 120	LT	0.1
BSS-454	96 - 120	LT	0.1

Blanton Soil Series

Nickel

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	2.1
BSS-061	0 - 6	LT	2.1
BSS-091	0 - 5	LT	4.2
BSS-231	0 - 7		0.1127
BSS-331	0 - 8		2.6
BSS-351	0 - 7		3.344
BSS-431	0 - 6		2
BSS-451	0 - 5		5.8
Second Layer			
BSS-012	10 - 65		3
BSS-062	6 - 50		5.52
BSS-092A	5 - 52	LT	4.2
BSS-232	7 - 61	LT	4.2
BSS-332	8 - 72		4
BSS-352	7 - 60		5.5
BSS-432	6 - 67	LT	2
BSS-452	5 - 59		3.4
Third Layer			
BSS-013	65 - 87	LT	2.1
BSS-063	50 - 74		3.47
BSS-093A	52 - 72	LT	4.2
BSS-233	61 - 70		0.1574
BSS-333	72 - 84		7
BSS-353	60 - 72		7.532
BSS-433	67 - 77		3.9
BSS-453	59 - 72		3.8
Fourth Layer			
BSS-014	111 - 124		2.2
BSS-064	96 - 120		9.57
BSS-094A	96 - 120	LT	4.2
BSS-234	96 - 120		3.504
BSS-334	96 - 120		5.2
BSS-354	96 - 120		1.713
BSS-434	96 - 120	LT	2
BSS-454	96 - 120		3.4

Blanton Soil Series

Potassium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	40
BSS-061	0 - 6	LT	40
BSS-091	0 - 5	LT	360
BSS-231	0 - 7	LT	326
BSS-331	0 - 8	LT	180
BSS-351	0 - 7		139.4
BSS-431	0 - 6	LT	180
BSS-451	0 - 5	LT	180
Second Layer			
BSS-012	10 - 65	LT	40
BSS-062	6 - 50	LT	40
BSS-092A	5 - 52	LT	360
BSS-232	7 - 61	LT	800
BSS-332	8 - 72	LT	180
BSS-352	7 - 60	LT	326
BSS-432	6 - 67	LT	180
BSS-452	5 - 59		188
Third Layer			
BSS-013	65 - 87	LT	40
BSS-063	50 - 74	LT	40
BSS-093A	52 - 72	LT	360
BSS-233	61 - 70		82.96
BSS-333	72 - 84	LT	180
BSS-353	60 - 72		89.6
BSS-433	67 - 77	LT	180
BSS-453	59 - 72		224
Fourth Layer			
BSS-014	111 - 124	LT	40
BSS-064	96 - 120	LT	40
BSS-094A	96 - 120	LT	360
BSS-234	96 - 120		59.73
BSS-334	96 - 120	LT	180
BSS-354	96 - 120		159.3
BSS-434	96 - 120	LT	180
BSS-454	96 - 120	LT	180

Blanton Soil Series

Selenium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	0.2
BSS-061	0 - 6	LT	0.2
BSS-091	0 - 5	LT	0.4
BSS-231	0 - 7		0.44
BSS-331	0 - 8	LT	0.4
BSS-351	0 - 7	LT	0.4
BSS-431	0 - 6	LT	0.4
BSS-451	0 - 5	LT	0.4
Second Layer			
BSS-012	10 - 65	LT	0.2
BSS-062	6 - 50		0.35
BSS-092A	5 - 52	LT	0.4
BSS-232	7 - 61	LT	1
BSS-332	8 - 72	LT	4
BSS-352	7 - 60	LT	0.4
BSS-432	6 - 67	LT	4
BSS-452	5 - 59	LT	0.4
Third Layer			
BSS-013	65 - 87	LT	0.2
BSS-063	50 - 74		0.64
BSS-093A	52 - 72		0.45
BSS-233	61 - 70	LT	0.4
BSS-333	72 - 84	LT	0.4
BSS-353	60 - 72		0.8
BSS-433	67 - 77	LT	0.4
BSS-453	59 - 72		1.15
Fourth Layer			
BSS-014	111 - 124	LT	0.2
BSS-064	96 - 120		0.58
BSS-094A	96 - 120	LT	0.4
BSS-234	96 - 120	LT	0.4
BSS-334	96 - 120	LT	0.4
BSS-354	96 - 120	LT	0.4
BSS-434	96 - 120		0.42
BSS-454	96 - 120	LT	0.4

Blanton Soil Series

Silver

Unit: microgram/gram

First Layer	Interval(inches)	Modifier	Result
BSS-011	0 - 7	LT	0.3
BSS-061	0 - 6	LT	0.3
BSS-091	0 - 5	LT	0.6
BSS-231	0 - 7		0.2395
BSS-331	0 - 8	LT	1
BSS-351	0 - 7	LT	0.6
BSS-431	0 - 6	LT	1
BSS-451	0 - 5	LT	1
Second Layer			
BSS-012	10 - 65	LT	0.3
BSS-062	6 - 50	LT	0.3
BSS-092A	5 - 52	LT	0.6
BSS-232	7 - 61	LT	0.6
BSS-332	8 - 72	LT	1
BSS-352	7 - 60	LT	0.6
BSS-432	6 - 67	LT	1
BSS-452	5 - 59	LT	1
Third Layer			
BSS-013	65 - 87		0.3
BSS-063	50 - 74	LT	0.3
BSS-093A	52 - 72	LT	0.6
BSS-233	61 - 70	LT	0.6
BSS-333	72 - 84	LT	1
BSS-353	60 - 72	LT	0.6
BSS-433	67 - 77	LT	1
BSS-453	59 - 72	LT	1
Fourth Layer			
BSS-014	111 - 124	LT	0.3
BSS-064	96 - 120	LT	0.3
BSS-094A	96 - 120	LT	0.6
BSS-234	96 - 120	LT	0.6
BSS-334	96 - 120	LT	1
BSS-354	96 - 120	LT	0.6
BSS-434	96 - 120	LT	1
BSS-454	96 - 120	LT	1

Blanton Soil Series

Sodium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		23.7
BSS-061	0 - 6		30.4
BSS-091	0 - 5		39.8
BSS-231	0 - 7		38.05
BSS-331	0 - 8		78
BSS-351	0 - 7		45.54
BSS-431	0 - 6		26.7
BSS-451	0 - 5		31.8
Second Layer			
BSS-012	10 - 65		22.2
BSS-062	6 - 50		26.5
BSS-092A	5 - 52		56.4
BSS-232	7 - 61		44.36
BSS-332	8 - 72		109.4
BSS-352	7 - 60		43.2
BSS-432	6 - 67		26.1
BSS-452	5 - 59		60
Third Layer			
BSS-013	65 - 87		20.1
BSS-063	50 - 74		47.4
BSS-093A	52 - 72		45.6
BSS-233	61 - 70		37.12
BSS-333	72 - 84		42.4
BSS-353	60 - 72		38.05
BSS-433	67 - 77		43.5
BSS-453	59 - 72		58
Fourth Layer			
BSS-014	111 - 124		24.1
BSS-064	96 - 120		24
BSS-094A	96 - 120		40.6
BSS-234	96 - 120		35.71
BSS-334	96 - 120		42.4
BSS-354	96 - 120		45.38
BSS-434	96 - 120		52
BSS-454	96 - 120		57.6

Blanton Soil Series

Zinc

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		4.85
BSS-061	0 - 6		3.77
BSS-091	0 - 5		8.8
BSS-231	0 - 7		13.59
BSS-331	0 - 8		3.2
BSS-351	0 - 7		11.25
BSS-431	0 - 6		5.8
BSS-451	0 - 5		4.8
Second Layer			
BSS-012	10 - 65		6.2
BSS-062	6 - 50		14.5
BSS-092A	5 - 52		12.6
BSS-232	7 - 61		5
BSS-332	8 - 72		11.2
BSS-352	7 - 60		10.96
BSS-432	6 - 67		4.7
BSS-452	5 - 59		3
Third Layer			
BSS-013	65 - 87		10.8
BSS-063	50 - 74		9.27
BSS-093A	52 - 72		10.5
BSS-233	61 - 70		6.829
BSS-333	72 - 84		8.2
BSS-353	60 - 72		13.12
BSS-433	67 - 77		13.6
BSS-453	59 - 72		5.8
Fourth Layer			
BSS-014	111 - 124		12.7
BSS-064	96 - 120		13.5
BSS-094A	96 - 120		7.65
BSS-234	96 - 120		8.594
BSS-334	96 - 120		10.8
BSS-354	96 - 120		9.864
BSS-434	96 - 120		24.6
BSS-454	96 - 120		3.4

Fuquay Soil Series

Aluminum

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		2357
BSS-071	0 - 8		2207
BSS-081	0 - 6		3540
BSS-211	0 - 5		2041
BSS-321	0 - 6		1974
BSS-421	0 - 9		3305.2
BSS-441	0 - 7		2311.8
BSS-491	0 - 9		2461.2
Second Layer			
BSS-032	10 - 39		4046
BSS-072A	8 - 36		16550
BSS-082	6 - 36		8086
BSS-212A	5 - 47		5189
BSS-322	6 - 49		5040
BSS-422	9 - 45		14686
BSS-442	7 - 38		2906
BSS-492	9 - 41		4147.8
Third Layer			
BSS-033	39 - 72		24370
BSS-073A	36 - 72		17270
BSS-083	36 - 72		31640
BSS-213A	47 - 77		19510
BSS-323	49 - 72		26290
BSS-423	45 - 72		17541
BSS-443	38 - 70		20316
BSS-493	41 - 72		20492
Fourth Layer			
BSS-034	96 - 120		11620
BSS-074A	96 - 120		26510
BSS-084	96 - 120		26140
BSS-214A	96 - 120		12130
BSS-324	96 - 120		2072
BSS-424	96 - 120		5113.4
BSS-444	96 - 120		10366
BSS-494	96 - 120		11849

Fuquay Soil Series

Arsenic

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	0.5
BSS-071	0 - 8	LT	0.5
BSS-081	0 - 6	LT	2
BSS-211	0 - 5	LT	1
BSS-321	0 - 6	LT	1
BSS-421	0 - 9	LT	2
BSS-441	0 - 7	LT	2
BSS-491	0 - 9	LT	2
Second Layer			
BSS-032	10 - 39	LT	0.5
BSS-072A	8 - 36		1.46
BSS-082	6 - 36	LT	2
BSS-212A	5 - 47	LT	1
BSS-322	6 - 49	LT	1
BSS-422	9 - 45	LT	2
BSS-442	7 - 38	LT	2
BSS-492	9 - 41	LT	2
Third Layer			
BSS-033	39 - 72		2.34
BSS-073A	36 - 72		4.62
BSS-083	36 - 72		11.6
BSS-213A	47 - 77		6.23
BSS-323	49 - 72		7.26
BSS-423	45 - 72		2
BSS-443	38 - 70		2.4
BSS-493	41 - 72		2.4
Fourth Layer			
BSS-034	96 - 120		2.19
BSS-074A	96 - 120		15.2
BSS-084	96 - 120		6.49
BSS-214A	96 - 120		3.73
BSS-324	96 - 120		1.84
BSS-424	96 - 120		3.2
BSS-444	96 - 120	LT	2
BSS-494	96 - 120	LT	2

Fuquay Soil Series

Barium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		4.57
BSS-071	0 - 8		11.9
BSS-081	0 - 6		28.7
BSS-211	0 - 5		9.557
BSS-321	0 - 6		10.18
BSS-421	0 - 9		17.4
BSS-441	0 - 7		7.6
BSS-491	0 - 9		15.5
Second Layer			
BSS-032	10 - 39		9.72
BSS-072A	8 - 36		42.6
BSS-082	6 - 36		16.5
BSS-212A	5 - 47		17.49
BSS-322	6 - 49		24.02
BSS-422	9 - 45		50.4
BSS-442	7 - 38		8.4
BSS-492	9 - 41		20.6
Third Layer			
BSS-033	39 - 72		19.2
BSS-073A	36 - 72		15.3
BSS-083	36 - 72		11.4
BSS-213A	47 - 77		14.36
BSS-323	49 - 72		34.73
BSS-423	45 - 72		23
BSS-443	38 - 70		20
BSS-493	41 - 72		19.1
Fourth Layer			
BSS-034	96 - 120		6.24
BSS-074A	96 - 120		12.2
BSS-084	96 - 120		9.44
BSS-214A	96 - 120		4.622
BSS-324	96 - 120		14.87
BSS-424	96 - 120		3
BSS-444	96 - 120		6.4
BSS-494	96 - 120		7.4

Fuquay Soil Series

Cadmium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	0.5
BSS-071	0 - 8	LT	0.5
BSS-081	0 - 6	LT	1
BSS-211	0 - 5		0.8619
BSS-321	0 - 6		0.7293
BSS-421	0 - 9	LT	0.6
BSS-441	0 - 7	LT	0.6
BSS-491	0 - 9	LT	0.6
Second Layer			
BSS-032	10 - 39	LT	0.5
BSS-072A	8 - 36	LT	0.5
BSS-082	6 - 36	LT	1
BSS-212A	5 - 47		0.5967
BSS-322	6 - 49	LT	1
BSS-422	9 - 45	LT	0.6
BSS-442	7 - 38	LT	0.6
BSS-492	9 - 41	LT	0.6
Third Layer			
BSS-033	39 - 72	LT	0.5
BSS-073A	36 - 72	LT	0.5
BSS-083	36 - 72	LT	1
BSS-213A	47 - 77	LT	1
BSS-323	49 - 72		0.5304
BSS-423	45 - 72	LT	0.6
BSS-443	38 - 70	LT	0.6
BSS-493	41 - 72	LT	0.6
Fourth Layer			
BSS-034	96 - 120	LT	0.5
BSS-074A	96 - 120	LT	0.5
BSS-084	96 - 120	LT	1
BSS-214A	96 - 120		0.5304
BSS-324	96 - 120		0.8619
BSS-424	96 - 120	LT	0.6
BSS-444	96 - 120	LT	0.6
BSS-494	96 - 120	LT	0.6

Fuquay Soil Series

Chromium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		2.28
BSS-071	0 - 8		2.34
BSS-081	0 - 6		30.6
BSS-211	0 - 5		4.936
BSS-321	0 - 6		3.154
BSS-421	0 - 9		3.8
BSS-441	0 - 7		2.4
BSS-491	0 - 9		3.8
Second Layer			
BSS-032	10 - 39		3.5
BSS-072A	8 - 36		10.2
BSS-082	6 - 36		39.4
BSS-212A	5 - 47		6.719
BSS-322	6 - 49		6.3
BSS-422	9 - 45		13.8
BSS-442	7 - 38		10.6
BSS-492	9 - 41		3.7
Third Layer			
BSS-033	39 - 72		30.9
BSS-073A	36 - 72		30.4
BSS-083	36 - 72		53.4
BSS-213A	47 - 77		31.98
BSS-323	49 - 72		31.67
BSS-423	45 - 72		25
BSS-443	38 - 70		39.2
BSS-493	41 - 72		21.9
Fourth Layer			
BSS-034	96 - 120		30.4
BSS-074A	96 - 120		33.7
BSS-084	96 - 120		105.1
BSS-214A	96 - 120		18.1
BSS-324	96 - 120		2.331
BSS-424	96 - 120		24.2
BSS-444	96 - 120		28.4
BSS-494	96 - 120		13.4

Fuquay Soil Series

Copper

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
RSS-031	0 - 6		0.71
BSS-071	0 - 8		1.42
BSS-081	0 - 6		2.3
BSS-211	0 - 5		2.133
BSS-321	0 - 6		1.262
BSS-421	0 - 9		1.8
BSS-441	0 - 7		1
BSS-491	0 - 9		2.3
Second Layer			
BSS-032	10 - 39		0.85
BSS-072A	8 - 36		3.99
BSS-082	6 - 36		1.16
BSS-212A	5 - 47		3.493
BSS-322	6 - 49		1.4
BSS-422	9 - 45		5
BSS-442	7 - 38		1.4
BSS-492	9 - 41		1.5
Third Layer			
BSS-033	39 - 72		4.2
BSS-073A	36 - 72		0.78
BSS-083	36 - 72		4.32
BSS-213A	47 - 77		3.64
BSS-323	49 - 72		7.766
BSS-423	45 - 72		8
BSS-443	38 - 70		13
BSS-493	41 - 72		7.1
Fourth Layer			
BSS-034	96 - 120		0.64
BSS-074A	96 - 120		4.77
BSS-084	96 - 120		11.1
BSS-214A	96 - 120		8.784
BSS-324	96 - 120		1.974
BSS-424	96 - 120		4.4
BSS-444	96 - 120		6
BSS-494	96 - 120		4.3

Fuquay Soil Series

Iron

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		2280
BSS-071	0 - 8		2040
BSS-081	0 - 6		1702
BSS-211	0 - 5		1126
BSS-321	0 - 6		885.9
BSS-421	0 - 9		1740.4
BSS-441	0 - 7		1767.4
BSS-491	0 - 9		1232.5
Second Layer			
BSS-032	10 - 39		4400
BSS-072A	8 - 36		11340
BSS-082	6 - 36		4400
BSS-212A	5 - 47		3237
BSS-322	6 - 49		2004
BSS-422	9 - 45		11136
BSS-442	7 - 38		2385.6
BSS-492	9 - 41		2289.1
Third Layer			
BSS-033	39 - 72		44600
BSS-073A	36 - 72		79600
BSS-083	36 - 72		21800
BSS-213A	47 - 77		16690
BSS-323	49 - 72		22610
BSS-423	45 - 72		19563
BSS-443	38 - 70		37068
BSS-493	41 - 72		16598
Fourth Layer			
BSS-034	96 - 120		61000
BSS-074A	96 - 120		49000
BSS-084	96 - 120		19880
BSS-214A	96 - 120		22560
BSS-324	96 - 120		1269
BSS-424	96 - 120		16938
BSS-444	96 - 120		26254
BSS-494	96 - 120		7718.3

Fuquay Soil Series

Lead

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		2.05
BSS-071	0 - 8		4.22
BSS-081	0 - 6		3.72
BSS-211	0 - 5		4.01
BSS-321	0 - 6		4.23
BSS-421	0 - 9		5.8
BSS-441	0 - 7		4.9
BSS-491	0 - 9		3.5
Second Layer			
BSS-032	10 - 39		2.32
BSS-072A	8 - 36		3.05
BSS-082	6 - 36		2.02
BSS-212A	5 - 47		3.07
BSS-322	6 - 49		3.82
BSS-422	9 - 45		8.6
BSS-442	7 - 38		2.4
BSS-492	9 - 41		3.2
Third Layer			
BSS-033	39 - 72		5.75
BSS-073A	36 - 72		7.12
BSS-083	36 - 72		5
BSS-213A	47 - 77	LT	6.75
BSS-323	49 - 72		3.82
BSS-423	45 - 72		6.8
BSS-443	38 - 70		8.6
BSS-493	41 - 72		4.7
Fourth Layer			
BSS-034	96 - 120		6.08
BSS-074A	96 - 120		10.9
BSS-084	96 - 120		4.15
BSS-214A	96 - 120		6.67
BSS-324	96 - 120		16.4
BSS-424	96 - 120		5.1
BSS-444	96 - 120		5.7
BSS-494	96 - 120		2.3

Fuquay Soil Series

Lithium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	10
BSS-071	0 - 8	LT	10
BSS-081	0 - 6	LT	10
BSS-211	0 - 5	LT	10
BSS-321	0 - 6	LT	10
BSS-421	0 - 9	LT	10
BSS-441	0 - 7	LT	10
BSS-491	0 - 9	LT	10
Second Layer			
BSS-032	10 - 39	LT	10
BSS-072A	8 - 36	LT	10
BSS-082	6 - 36	LT	10
BSS-212A	5 - 47	LT	10
BSS-322	6 - 49	LT	10
BSS-422	9 - 45	LT	10
BSS-442	7 - 38	LT	10
BSS-492	9 - 41	LT	10
Third Layer			
BSS-033	39 - 72	LT	10
BSS-073A	36 - 72	LT	10
BSS-083	36 - 72	LT	10
BSS-213A	47 - 77	LT	10
BSS-323	49 - 72		12.59
BSS-423	45 - 72	LT	10
BSS-443	38 - 70	LT	10
BSS-493	41 - 72	LT	10
Fourth Layer			
BSS-034	96 - 120	LT	10
BSS-074A	96 - 120	LT	10
BSS-084	96 - 120	LT	10
BSS-214A	96 - 120	LT	10
BSS-324	96 - 120	LT	10
BSS-424	96 - 120	LT	10
BSS-444	96 - 120	LT	10
BSS-494	96 - 120	LT	10

Fuquay Soil Series

Magnesium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		58.86
BSS-071	0 - 8		57.86
BSS-081	0 - 6		96.32
BSS-211	0 - 5		72.55
BSS-321	0 - 6		66.95
BSS-421	0 - 9		58.65
BSS-441	0 - 7		40.53
BSS-491	0 - 9		57.27
Second Layer			
BSS-032	10 - 39		86.15
BSS-072A	8 - 36		436.1
BSS-082	6 - 36		131
BSS-212A	5 - 47		145.4
BSS-322	6 - 49		197.7
BSS-422	9 - 45		296.7
BSS-442	7 - 38		91.37
BSS-492	9 - 41		93.58
Third Layer			
BSS-033	39 - 72		207.2
BSS-073A	36 - 72		348.7
BSS-083	36 - 72		219.3
BSS-213A	47 - 77		244.8
BSS-323	49 - 72		514
BSS-423	45 - 72		178.6
BSS-443	38 - 70		158
BSS-493	41 - 72		166.5
Fourth Layer			
BSS-034	96 - 120		94.2
BSS-074A	96 - 120		194.1
BSS-084	96 - 120		157
BSS-214A	96 - 120		71.93
BSS-324	96 - 120		171.5
BSS-424	96 - 120		49.25
BSS-444	96 - 120		46
BSS-494	96 - 120		81.48

Fuquay Soil Series

Manganese

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		7.698
BSS-071	0 - 8		92.72
BSS-081	0 - 6		79.39
BSS-211	0 - 5		35.62
BSS-321	0 - 6		50.94
BSS-421	0 - 9		73.61
BSS-441	0 - 7		13.63
BSS-491	0 - 9		75.91
Second Layer			
BSS-032	10 - 39		5.63
BSS-072A	8 - 36		34.43
BSS-082	6 - 36		13.88
BSS-212A	5 - 47		7.507
BSS-322	6 - 49		25.23
BSS-422	9 - 45		21.22
BSS-442	7 - 38		9.268
BSS-492	9 - 41		13.18
Third Layer			
BSS-033	39 - 72	LT	1.6
BSS-073A	36 - 72		13.75
BSS-083	36 - 72		15.1
BSS-213A	47 - 77		7.652
BSS-323	49 - 72	LT	1.6
BSS-423	45 - 72		3.217
BSS-443	38 - 70	LT	1.6
BSS-493	41 - 72	LT	1.6
Fourth Layer			
BSS-034	96 - 120	LT	1.6
BSS-074A	96 - 120		29.18
BSS-084	96 - 120		29.68
BSS-214A	96 - 120	LT	1.6
BSS-324	96 - 120		2.987
BSS-424	96 - 120		3.294
BSS-444	96 - 120	LT	1.6
BSS-494	96 - 120	LT	1.6

Fuquay Soil Series

Mercury

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	0.1
BSS-071	0 - 8	LT	0.1
BSS-081	0 - 6		0.89
BSS-211	0 - 5	LT	0.1
BSS-321	0 - 6	LT	0.1
BSS-421	0 - 9	LT	0.1
BSS-441	0 - 7	LT	0.1
BSS-491	0 - 9	LT	0.1
Second Layer			
BSS-032	10 - 39	LT	0.1
BSS-072A	8 - 36		0.1
BSS-082	6 - 36		0.1
BSS-212A	5 - 47	LT	0.1
BSS-322	6 - 49	LT	0.1
BSS-422	9 - 45	LT	0.1
BSS-442	7 - 38	LT	0.1
BSS-492	9 - 41	LT	0.1
Third Layer			
BSS-033	39 - 72	LT	0.1
BSS-073A	36 - 72	LT	0.1
BSS-083	36 - 72		0.32
BSS-213A	47 - 77		0.12
BSS-323	49 - 72	LT	0.12
BSS-423	45 - 72	LT	0.1
BSS-443	38 - 70	LT	0.1
BSS-493	41 - 72		0.11
Fourth Layer			
BSS-034	96 - 120	LT	0.1
BSS-074A	96 - 120	LT	0.1
BSS-084	96 - 120		0.22
BSS-214A	96 - 120	LT	0.1
BSS-324	96 - 120	LT	0.1
BSS-424	96 - 120	LT	0.1
BSS-444	96 - 120	LT	0.1
BSS-494	96 - 120	LT	0.1

Fuquay Soil Series

Nickel

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	2.1
BSS-071	0 - 8	LT	2.1
BSS-081	0 - 6		8.1
BSS-211	0 - 5		3.797
BSS-321	0 - 6	LT	4.2
BSS-421	0 - 9		2
BSS-441	0 - 7		3
BSS-491	0 - 9	LT	2
Second Layer			
BSS-032	10 - 39		2.99
BSS-072A	8 - 36		6.24
BSS-082	6 - 36		5.86
BSS-212A	5 - 47		2.677
BSS-322	6 - 49	LT	4.2
BSS-422	9 - 45		5.2
BSS-442	7 - 38		4.2
BSS-492	9 - 41	LT	2
Third Layer			
BSS-033	39 - 72		5.32
BSS-073A	36 - 72		8.35
BSS-083	36 - 72		7.42
BSS-213A	47 - 77	LT	4.2
BSS-323	49 - 72		6.483
BSS-423	45 - 72		6.8
BSS-443	38 - 70		4.6
BSS-493	41 - 72		3.7
Fourth Layer			
BSS-034	96 - 120		4.4
BSS-074A	96 - 120		7.54
BSS-084	96 - 120		17.9
BSS-214A	96 - 120		3.739
BSS-324	96 - 120		1.713
BSS-424	96 - 120		2
BSS-444	96 - 120	LT	2
BSS-494	96 - 120	LT	2

Fuquay Soil Series

Potassium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	40
BSS-071	0 - 8	LT	40
BSS-081	0 - 6	LT	80
BSS-211	0 - 5		146
BSS-321	0 - 6	LT	326
BSS-421	0 - 9	LT	180
BSS-441	0 - 7	LT	180
BSS-491	0 - 9	LT	180
Second Layer			
BSS-032	10 - 39	LT	40
BSS-072A	8 - 36		138
BSS-082	6 - 36	LT	80
BSS-212A	5 - 47		86.28
BSS-322	6 - 49	LT	300
BSS-422	9 - 45		202
BSS-442	7 - 38	LT	180
BSS-492	9 - 41	LT	180
Third Layer			
BSS-033	39 - 72		147.7
BSS-073A	36 - 72		47.6
BSS-083	36 - 72		47.5
BSS-213A	47 - 77	LT	800
BSS-323	49 - 72		238.9
BSS-423	45 - 72	LT	180
BSS-443	38 - 70	LT	180
BSS-493	41 - 72		278
Fourth Layer			
BSS-034	96 - 120		182.8
BSS-074A	96 - 120	LT	40
BSS-084	96 - 120		155
BSS-214A	96 - 120		96.23
BSS-324	96 - 120	LT	326
BSS-424	96 - 120	LT	180
BSS-444	96 - 120	LT	180
BSS-494	96 - 120	LT	180

Fuquay Soil Series

Selenium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	0.2
BSS-071	0 - 8	LT	0.2
BSS-081	0 - 6	LT	0.4
BSS-211	0 - 5	LT	0.4
BSS-321	0 - 6	LT	0.4
BSS-421	0 - 9	LT	0.4
BSS-441	0 - 7	LT	0.4
BSS-491	0 - 9	LT	0.4
Second Layer			
BSS-032	10 - 39	LT	0.2
BSS-072A	8 - 36		0.38
BSS-082	6 - 36	LT	0.4
BSS-212A	5 - 47	LT	0.4
BSS-322	6 - 49	LT	1
BSS-422	9 - 45	LT	0.4
BSS-442	7 - 38	LT	0.4
BSS-492	9 - 41	LT	0.4
Third Layer			
BSS-033	39 - 72		0.51
BSS-073A	36 - 72		0.79
BSS-083	36 - 72	LT	0.4
BSS-213A	47 - 77	LT	1
BSS-323	49 - 72		1.66
BSS-423	45 - 72	LT	0.4
BSS-443	38 - 70		0.93
BSS-493	41 - 72	LT	4
Fourth Layer			
BSS-034	96 - 120		0.25
BSS-074A	96 - 120		0.55
BSS-084	96 - 120	LT	0.4
BSS-214A	96 - 120		0.5
BSS-324	96 - 120		0.59
BSS-424	96 - 120	LT	0.4
BSS-444	96 - 120	LT	0.4
BSS-494	96 - 120	LT	0.4

Fuquay Soil Series

Silver

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	0.3
BSS-071	0 - 8	LT	0.3
BSS-081	0 - 6	LT	0.6
BSS-211	0 - 5	LT	0.6
BSS-321	0 - 6		0.548
BSS-421	0 - 9	LT	1
BSS-441	0 - 7	LT	1
BSS-491	0 - 9	LT	1
Second Layer			
BSS-032	10 - 39	LT	0.3
BSS-072A	8 - 36	LT	0.3
BSS-082	6 - 36	LT	0.6
BSS-212A	5 - 47	LT	0.6
BSS-322	6 - 49		1.7
BSS-422	9 - 45	LT	1
BSS-442	7 - 38	LT	1
BSS-492	9 - 41	LT	1
Third Layer			
BSS-033	39 - 72	LT	0.3
BSS-073A	36 - 72	LT	0.3
BSS-083	36 - 72	LT	0.6
BSS-213A	47 - 77	LT	0.6
BSS-323	49 - 72	LT	0.6
BSS-423	45 - 72	LT	1
BSS-443	38 - 70	LT	1
BSS-493	41 - 72	LT	1
Fourth Layer			
BSS-034	96 - 120	LT	0.3
BSS-074A	96 - 120	LT	0.3
BSS-084	96 - 120	LT	0.6
BSS-214A	96 - 120	LT	0.6
BSS-324	96 - 120		0.2158
BSS-424	96 - 120	LT	1
BSS-444	96 - 120	LT	1
BSS-494	96 - 120	LT	1

Fuquay Soil Series

Sodium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		19.6
BSS-071	0 - 8		20.4
BSS-081	0 - 6		47.9
BSS-211	0 - 5		54.42
BSS-321	0 - 6		60.04
BSS-421	0 - 9		51
BSS-441	0 - 7		26.8
BSS-491	0 - 9		27.4
Second Layer			
BSS-032	10 - 39		19.3
BSS-072A	8 - 36		37.6
BSS-082	6 - 36		28.6
BSS-212A	5 - 47		47.88
BSS-322	6 - 49		72.15
BSS-422	9 - 45		58.2
BSS-442	7 - 38		64.6
BSS-492	9 - 41		21.6
Third Layer			
BSS-033	39 - 72		36.8
BSS-073A	36 - 72		28.6
BSS-083	36 - 72		48.6
BSS-213A	47 - 77		63.34
BSS-323	49 - 72		58.95
BSS-423	45 - 72		64.6
BSS-443	38 - 70		52.6
BSS-493	41 - 72		45.6
Fourth Layer			
BSS-034	96 - 120		26.8
BSS-074A	96 - 120		41.5
BSS-084	96 - 120		50
BSS-214A	96 - 120		41.64
BSS-324	96 - 120		42.88
BSS-424	96 - 120		39.8
BSS-444	96 - 120		39
BSS-494	96 - 120		25.1

Fuquay Soil Series

Zinc

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		5.48
BSS-071	0 - 8		7.7
BSS-081	0 - 6		10.8
BSS-211	0 - 5		12.95
BSS-321	0 - 6		4.694
BSS-421	0 - 9		6
BSS-441	0 - 7		8.2
BSS-491	0 - 9		5.1
Second Layer			
BSS-032	10 - 39		4.69
BSS-072A	8 - 36		16.8
BSS-082	6 - 36		7.18
BSS-212A	5 - 47		10.76
BSS-322	6 - 49		6.04
BSS-422	9 - 45		9.8
BSS-442	7 - 38		2.2
BSS-492	9 - 41		4.1
Third Layer			
BSS-033	39 - 72		10.6
BSS-073A	36 - 72		19.6
BSS-083	36 - 72		14.7
BSS-213A	47 - 77		15.82
BSS-323	49 - 72		15.11
BSS-423	45 - 72		12
BSS-443	38 - 70		5.4
BSS-493	41 - 72		4.2
Fourth Layer			
BSS-034	96 - 120		9.75
BSS-074A	96 - 120		13.7
BSS-084	96 - 120		14.4
BSS-214A	96 - 120		12.67
BSS-324	96 - 120		8.178
BSS-424	96 - 120		3.4
BSS-444	96 - 120		4
BSS-494	96 - 120		8.3

Lakeland Soil Series

Aluminum

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8		1347
BSS-221	0	-	7		2502
BSS-411	0	-	5		2143
BSS-481	0	-	4		1399.6
BSS-511	0	-	5		4367.6
BSS-521	0	-	5		1708.2
BSS-561	0	-	5		1964.8
BSS-571	0	-	9		4169.6
Second Layer					
BSS-022	9	-	84		3612
BSS-222A	7	-	80		2010
BSS-412	5	-	80		2090
BSS-482	4	-	80		1886
BSS-512	5	-	80		3726.4
BSS-522	5	-	80		1966
BSS-562	5	-	80		1221.4
BSS-572	9	-	80		8959.5
Third Layer					
BSS-023	110	-	124		4092
BSS-223A	96	-	120		1669
BSS-413	96	-	120		4146
BSS-483	96	-	120		3407.2
BSS-513	96	-	120		21504
BSS-523	96	-	120		4697
BSS-563	96	-	120		1087.2
BSS-573	96	-	120		5219.7

Lakeland Soil Series

Arsenic

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-021	0	- 8	LT	0.5
BSS-221	0	- 7		1.02
BSS-411	0	- 5	LT	1
BSS-481	0	- 4	LT	2
BSS-511	0	- 5	LT	2
BSS-521	0	- 5	LT	2
BSS-561	0	- 5	LT	2
BSS-571	0	- 9	LT	2
Second Layer				
BSS-022	9	- 84	LT	0.5
BSS-222A	7	- 80		0.85
BSS-412	5	- 80	LT	1
BSS-482	4	- 80	LT	2
BSS-512	5	- 80	LT	2
BSS-522	5	- 80	LT	2
BSS-562	5	- 80		2
BSS-572	9	- 80	LT	2
Third Layer				
BSS-023	110	- 124	LT	0.5
BSS-223A	96	- 120	LT	0.6
BSS-413	96	- 120		4.81
BSS-483	96	- 120	LT	2
BSS-513	96	- 120		5.4
BSS-523	96	- 120		2.2
BSS-563	96	- 120	LT	2
BSS-573	96	- 120	LT	2

Lakeland Soil Series

Barium

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-021	0	-	8	7.61
BSS-221	0	-	7	3.993
BSS-411	0	-	5	13.55
BSS-481	0	-	4	3
BSS-511	0	-	5	24
BSS-521	0	-	5	5.2
BSS-561	0	-	5	8.2
BSS-571	0	-	9	58.2
Second Layer				
BSS-022	9	-	84	12.3
BSS-222A	7	-	80	5.011
BSS-412	5	-	80	9.764
BSS-482	4	-	80	5.4
BSS-512	5	-	80	12.6
BSS-522	5	-	80	5.8
BSS-562	5	-	80	3.6
BSS-572	9	-	80	32.3
Third Layer				
BSS-023	110	-	124	7.79
BSS-223A	96	-	120	4.071
BSS-413	96	-	120	18.61
BSS-483	96	-	120	4
BSS-513	96	-	120	36.6
BSS-523	96	-	120	8.4
BSS-563	96	-	120	2.6
BSS-573	96	-	120	65.2

Lakeland Soil Series

Cadmium

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8		0.52
BSS-221	0	-	7	LT	1
BSS-411	0	-	5	LT	1
BSS-481	0	-	4	LT	0.6
BSS-511	0	-	5	LT	0.6
BSS-521	0	-	5	LT	0.6
BSS-561	0	-	5	LT	0.6
BSS-571	0	-	9	LT	0.6
Second Layer					
BSS-022	9	-	84		0.5
BSS-222A	7	-	80	LT	1
BSS-412	5	-	80	LT	1
BSS-482	4	-	80	LT	0.6
BSS-512	5	-	80	LT	0.6
BSS-522	5	-	80	LT	0.6
BSS-562	5	-	80	LT	0.6
BSS-572	9	-	80	LT	0.6
Third Layer					
BSS-023	110	-	124	LT	0.5
BSS-223A	96	-	120	LT	1
BSS-413	96	-	120	LT	1
BSS-483	96	-	120	LT	0.6
BSS-513	96	-	120	LT	0.6
BSS-523	96	-	120	LT	0.6
BSS-563	96	-	120	LT	0.6
BSS-573	96	-	120	LT	0.6

Lakeland Soil Series

Chromium

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8		1.31
BSS-221	0	-	7		4.33
BSS-411	0	-	5		3.01
BSS-481	0	-	4		5
BSS-511	0	-	5		4
BSS-521	0	-	5		4.2
BSS-561	0	-	5		5.8
BSS-571	0	-	9		7.1
Second Layer					
BSS-022	9	-	84		3.33
BSS-222A	7	-	80		3.862
BSS-412	5	-	80		3.364
BSS-482	4	-	80		6.2
BSS-512	5	-	80		4.8
BSS-522	5	-	80		4
BSS-562	5	-	80		5.8
BSS-572	9	-	80		6.8
Third Layer					
BSS-023	110	-	124		4.85
BSS-223A	96	-	120		8.425
BSS-413	96	-	120		18.29
BSS-483	96	-	120		6
BSS-513	96	-	120		35.2
BSS-523	96	-	120		6.6
BSS-563	96	-	120		11.4
BSS-573	96	-	120		6.4

Lakeland Soil Series

Copper

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-021	0	-	8	1
BSS-221	0	-	7	2.116
BSS-411	0	-	5	1.422
BSS-481	0	-	4	1.6
BSS-511	0	-	5	2.2
BSS-521	0	-	5	1.8
BSS-561	0	-	5	2
BSS-571	0	-	9	2.7
Second Layer				
BSS-022	9	-	84	2.14
BSS-222A	7	-	80	2.108
BSS-412	5	-	80	1.282
BSS-482	4	-	80	2
BSS-512	5	-	80	2.2
BSS-522	5	-	80	2.2
BSS-562	5	-	80	1.6
BSS-572	9	-	80	5.5
Third Layer				
BSS-023	110	-	124	2.71
BSS-223A	96	-	120	1.849
BSS-413	96	-	120	1.282
BSS-483	96	-	120	2.6
BSS-513	96	-	120	9.6
BSS-523	96	-	120	2.4
BSS-563	96	-	120	4.2
BSS-573	96	-	120	4.4

Lakeland Soil Series

Iron

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8		1456
BSS-221	0	-	7		1534
BSS-411	0	-	5		1474
BSS-481	0	-	4		1634.6
BSS-511	0	-	5		2653.6
BSS-521	0	-	5		1416.6
BSS-561	0	-	5		2183.4
BSS-571	0	-	9		2580.6
Second Layer					
BSS-022	9	-	84		5780
BSS-222A	7	-	80		1426
BSS-412	5	-	80		1758
BSS-482	4	-	80		2243.8
BSS-512	5	-	80		2632.2
BSS-522	5	-	80		1477
BSS-562	5	-	80		1929.4
BSS-572	9	-	80		6909.3
Third Layer					
BSS-023	110	-	124		6900
BSS-223A	96	-	120		1313
BSS-413	96	-	120		1758
BSS-483	96	-	120		4192.2
BSS-513	96	-	120		26308
BSS-523	96	-	120		3645.6
BSS-563	96	-	120		3899
BSS-573	96	-	120		5112.8

Lakeland Soil Series

Lead

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8		0.67
BSS-221	0	-	7		16.67
BSS-411	0	-	5		3.3
BSS-481	0	-	4		1.6
BSS-511	0	-	5		3.1
BSS-521	0	-	5		4.7
BSS-561	0	-	5		4.1
BSS-571	0	-	9		2
Second Layer					
BSS-022	9	-	84		1.76
BSS-222A	7	-	80		7.32
BSS-412	5	-	80		2.26
BSS-482	4	-	80	LT	1
BSS-512	5	-	80		1.9
BSS-522	5	-	80		1.2
BSS-562	5	-	80	LT	1
BSS-572	9	-	80		1.4
Third Layer					
BSS-023	110	-	124		1.05
BSS-223A	96	-	120		6.3
BSS-413	96	-	120		4.68
BSS-483	96	-	120		2.4
BSS-513	96	-	120		5.2
BSS-523	96	-	120		2.4
BSS-563	96	-	120	LT	1
BSS-573	96	-	120	LT	1

Lakeland Soil Series

Lithium

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8	LT	10
BSS-221	0	-	7	LT	10
BSS-411	0	-	5	LT	10
BSS-481	0	-	4	LT	10
BSS-511	0	-	5	LT	10
BSS-521	0	-	5	LT	10
BSS-561	0	-	5	LT	10
BSS-571	0	-	9	LT	10
Second Layer					
BSS-022	9	-	84	LT	10
BSS-222A	7	-	80	LT	10
BSS-412	5	-	80	LT	10
BSS-482	4	-	80	LT	10
BSS-512	5	-	80	LT	10
BSS-522	5	-	80	LT	10
BSS-562	5	-	80	LT	10
BSS-572	9	-	80	LT	10
Third Layer					
BSS-023	110	-	124	LT	10
BSS-223A	96	-	120	LT	10
BSS-413	96	-	120	LT	10
BSS-483	96	-	120	LT	10
BSS-513	96	-	120	LT	10
BSS-523	96	-	120	LT	10
BSS-563	96	-	120	LT	10
BSS-573	96	-	120	LT	10

Lakeland Soil Series

Magnesium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-021	0 - 8		32.65
BSS-221	0 - 7		58.49
BSS-411	0 - 5		99.26
BSS-481	0 - 4		60.04
BSS-511	0 - 5		106.2
BSS-521	0 - 5		35.27
BSS-561	0 - 5		79.75
BSS-571	0 - 9		140.1
Second Layer			
BSS-022	9 - 84		145.1
BSS-222A	7 - 80		63.06
BSS-412	5 - 80		108.2
BSS-482	4 - 80		47.72
BSS-512	5 - 80		95.45
BSS-522	5 - 80		45.37
BSS-562	5 - 80		102.8
BSS-572	9 - 80		140.6
Third Layer			
BSS-023	110 - 124		63.43
BSS-223A	96 - 120		50.1
BSS-413	96 - 120		107.4
BSS-483	96 - 120		25.25
BSS-513	96 - 120		254.6
BSS-523	96 - 120		79.68
BSS-563	96 - 120		59.21
BSS-573	96 - 120		137.5

Lakeland Soil Series

Manganese

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-021	0 - 8		69.21
BSS-221	0 - 7		3.738
BSS-411	0 - 5		127.9
BSS-481	0 - 4		5.132
BSS-511	0 - 5		104.6
BSS-521	0 - 5		2.987
BSS-561	0 - 5		9.881
BSS-571	0 - 9		498.2
Second Layer			
BSS-022	9 - 84		45.42
BSS-222A	7 - 80		4.724
BSS-412	5 - 80		17.39
BSS-482	4 - 80		6.358
BSS-512	5 - 80		12.79
BSS-522	5 - 80		14.25
BSS-562	5 - 80		5.898
BSS-572	9 - 80		141.2
Third Layer			
BSS-023	110 - 124		11.6
BSS-223A	96 - 120		4.299
BSS-413	96 - 120		5.445
BSS-483	96 - 120		4.673
BSS-513	96 - 120		5.515
BSS-523	96 - 120		3.907
BSS-563	96 - 120		5.898
BSS-573	96 - 120		169.3

Lakeland Soil Series

Mercury

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-021	0	- 8	LT	0.1
BSS-221	0	- 7	LT	0.1
BSS-411	0	- 5	LT	0.1
BSS-481	0	- 4	LT	0.1
BSS-511	0	- 5	LT	0.1
BSS-521	0	- 5	LT	0.1
BSS-561	0	- 5	LT	0.1
BSS-571	0	- 9	LT	0.1
Second Layer				
BSS-022	9	- 84	LT	0.1
BSS-222A	7	- 80		0.1
BSS-412	5	- 80	LT	0.1
BSS-482	4	- 80	LT	0.1
BSS-512	5	- 80	LT	0.1
BSS-522	5	- 80	LT	0.1
BSS-562	5	- 80	LT	0.1
BSS-572	9	- 80	LT	0.1
Third Layer				
BSS-023	110	- 124	LT	0.1
BSS-223A	96	- 120		0.14
BSS-413	96	- 120	LT	0.1
BSS-483	96	- 120	LT	0.1
BSS-513	96	- 120	LT	0.1
BSS-523	96	- 120	LT	0.1
BSS-563	96	- 120	LT	0.1
BSS-573	96	- 120	LT	0.1

Lakeland Soil Series

Nickel

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-021	0 - 8	LT	2.1
BSS-221	0 - 7	LT	5.2
BSS-411	0 - 5		1.081
BSS-481	0 - 4		2.8
BSS-511	0 - 5		3
BSS-521	0 - 5		2.6
BSS-561	0 - 5		2.2
BSS-571	0 - 9		3.1
Second Layer			
BSS-022	9 - 84		3.33
BSS-222A	7 - 80	LT	5.2
BSS-412	5 - 80		4.406
BSS-482	4 - 80		2.4
BSS-512	5 - 80		2.6
BSS-522	5 - 80		2
BSS-562	5 - 80	LT	2
BSS-572	9 - 80		4.2
Third Layer			
BSS-023	110 - 124	LT	2.1
BSS-223A	96 - 120		6.762
BSS-413	96 - 120		4.406
BSS-483	96 - 120	LT	2
BSS-513	96 - 120		4.6
BSS-523	96 - 120	LT	2
BSS-563	96 - 120	LT	2
BSS-573	96 - 120		3.3

Lakeland Soil Series

Potassium

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8	LT	40
BSS-221	0	-	7	LT	800
BSS-411	0	-	5		145.2
BSS-481	0	-	4		196
BSS-511	0	-	5	LT	180
BSS-521	0	-	5		254
BSS-561	0	-	5		220
BSS-571	0	-	9	LT	180
Second Layer					
BSS-022	9	-	84		28.6
BSS-222A	7	-	80	LT	800
BSS-412	5	-	80		170.5
BSS-482	4	-	80		274
BSS-512	5	-	80	LT	180
BSS-522	5	-	80	LT	180
BSS-562	5	-	80	LT	180
BSS-572	9	-	80	LT	180
Third Layer					
BSS-023	110	-	124		73.5
BSS-223A	96	-	120	LT	800
BSS-413	96	-	120		170.5
BSS-483	96	-	120		184
BSS-513	96	-	120	LT	180
BSS-523	96	-	120		190
BSS-563	96	-	120	LT	180
BSS-573	96	-	120	LT	180

Lakeland Soil Series

Selenium

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8	LT	0.2
BSS-221	0	-	7	LT	0.4
BSS-411	0	-	5	LT	0.4
BSS-481	0	-	4	LT	0.4
BSS-511	0	-	5	LT	0.4
BSS-521	0	-	5	LT	0.4
BSS-561	0	-	5	LT	0.4
BSS-571	0	-	9	LT	0.4
Second Layer					
BSS-022	9	-	84	LT	0.2
BSS-222A	7	-	80	LT	0.4
BSS-412	5	-	80	LT	1
BSS-482	4	-	80	LT	4
BSS-512	5	-	80	LT	4
BSS-522	5	-	80	LT	0.4
BSS-562	5	-	80	LT	0.4
BSS-572	9	-	80	LT	0.4
Third Layer					
BSS-023	110	-	124	LT	0.2
BSS-223A	96	-	120	LT	0.4
BSS-413	96	-	120	LT	0.4
BSS-483	96	-	120	LT	0.4
BSS-513	96	-	120		0.75
BSS-523	96	-	120	LT	0.4
BSS-563	96	-	120	LT	0.4
BSS-573	96	-	120	LT	0.4

Lakeland Soil Series

Silver

Unit: microgram/gram

First Layer	Interval(inches)	Modifier	Result
BSS-021	0 - 8	LT	0.3
BSS-221	0 - 7	LT	1.4
BSS-411	0 - 5		0.6071
BSS-481	0 - 4	LT	1
BSS-511	0 - 5	LT	1
BSS-521	0 - 5	LT	1
BSS-561	0 - 5	LT	1
BSS-571	0 - 9	LT	1
Second Layer			
BSS-022	9 - 84	LT	0.3
BSS-222A	7 - 80	LT	1.4
BSS-412	5 - 80	LT	0.6
BSS-482	4 - 80	LT	1
BSS-512	5 - 80	LT	1
BSS-522	5 - 80	LT	1
BSS-562	5 - 80	LT	1
BSS-572	9 - 80	LT	1
Third Layer			
BSS-023	110 - 124	LT	0.3
BSS-223A	96 - 120	LT	1.4
BSS-413	96 - 120	LT	0.6
BSS-483	96 - 120	LT	1
BSS-513	96 - 120	LT	1
BSS-523	96 - 120	LT	1
BSS-563	96 - 120	LT	1
BSS-573	96 - 120	LT	1

Lakeland Soil Series

Sodium

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8		26.2
BSS-221	0	-	7		42.49
BSS-411	0	-	5		60.44
BSS-481	0	-	4		24.6
BSS-511	0	-	5		36.2
BSS-521	0	-	5		28.4
BSS-561	0	-	5		34
BSS-571	0	-	9		354.6
Second Layer					
BSS-022	9	-	84		24.6
BSS-222A	7	-	80		36.34
BSS-412	5	-	80		41.55
BSS-482	4	-	80		99.4
BSS-512	5	-	80		50.6
BSS-522	5	-	80		19.6
BSS-562	5	-	80		14.8
BSS-572	9	-	80		28.2
Third Layer					
BSS-023	110	-	124		27.7
BSS-223A	96	-	120		33.14
BSS-413	96	-	120		41.55
BSS-483	96	-	120		123.2
BSS-513	96	-	120		73.6
BSS-523	96	-	120		28.8
BSS-563	96	-	120	LT	7
BSS-573	96	-	120		35.1

Lakeland Soil Series

Zinc

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-021	0	-	8	11.8
BSS-221	0	-	7	8.531
BSS-411	0	-	5	6.852
BSS-481	0	-	4	5.4
BSS-511	0	-	5	7.6
BSS-521	0	-	5	4.4
BSS-561	0	-	5	3.6
BSS-571	0	-	9	8.9
Second Layer				
BSS-022	9	-	84	17.2
BSS-222A	7	-	80	10.11
BSS-412	5	-	80	6.981
BSS-482	4	-	80	13.2
BSS-512	5	-	80	7.2
BSS-522	5	-	80	4.8
BSS-562	5	-	80	5.6
BSS-572	9	-	80	16.1
Third Layer				
BSS-023	110	-	124	10.2
BSS-223A	96	-	120	7.72
BSS-413	96	-	120	6.981
BSS-483	96	-	120	4.2
BSS-513	96	-	120	11.8
BSS-523	96	-	120	7
BSS-563	96	-	120	11
BSS-573	96	-	120	12.1

Orangeburg Soil Series

Aluminum

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		4849
BSS-101	0 - 6		4175
BSS-111	0 - 6		9080
BSS-341	0 - 6		5871.2
BSS-401	0 - 8		3607
BSS-461	0 - 10		8034.6
BSS-501	0 - 6		4313.2
BSS-541	0 - 6		4418.3
Second Layer			
BSS-042A	6 - 25		29930
BSS-102A	6 - 16		12460
BSS-112A	6 - 38		50100
BSS-342	6 - 28		17030
BSS-402	8 - 20		22470
BSS-462	10 - 22		25894
BSS-502	6 - 20		21426
BSS-542	6 - 24		13022
Third Layer			
BSS-043A	25 - 34		26300
BSS-103A	16 - 34		31000
BSS-343	28 - 48		18667
BSS-403	20 - 48		24690
BSS-463	22 - 50		24804
BSS-503	20 - 34		22268
BSS-543	24 - 40		21989
Fourth Layer			
BSS-044A	34 - 65		30660
BSS-104A	34 - 60		28400
BSS-113A	38 - 60		13450
BSS-114A	60 - 80		51730
BSS-344	48 - 60		15628
BSS-404	48 - 72		17940
BSS-464	50 - 63		30924
BSS-504	34 - 60		28530
BSS-544	40 - 68		25786
Fifth Layer			
BSS-045A	89 - 103		53530
BSS-105A	90 - 120		9520
BSS-115A	96 - 120		26850
BSS-345	108 - 132		7651.4
BSS-405	96 - 120		16340
BSS-465	96 - 120		18775.2
BSS-505	96 - 120		17117
BSS-545	96 - 120		19520

Orangeburg Soil Series

Arsenic

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6	LT	0.5
BSS-101	0 - 6		1.87
BSS-111	0 - 6		1.93
BSS-341	0 - 6	LT	2
BSS-401	0 - 8		1.32
BSS-461	0 - 10	LT	2
BSS-501	0 - 6	LT	2
BSS-541	0 - 6	LT	2
Second Layer			
BSS-042A	6 - 25		3.42
BSS-102A	6 - 16		2.19
BSS-112A	6 - 38		4.87
BSS-342	6 - 28	LT	2
BSS-402	8 - 20		7.93
BSS-462	10 - 22	LT	2
BSS-502	6 - 20	LT	2
BSS-542	6 - 24		3.2
Third Layer			
BSS-043A	25 - 34		4.1
BSS-103A	16 - 34		3
BSS-343	28 - 48	LT	2
BSS-403	20 - 48	LT	5
BSS-463	22 - 50	LT	2
BSS-503	20 - 34	LT	2
BSS-543	24 - 40		2
Fourth Layer			
BSS-044A	34 - 65		5.78
BSS-104A	34 - 60		2.96
BSS-113A	38 - 60		3.28
BSS-114A	60 - 80		6.84
BSS-344	48 - 60	LT	2
BSS-404	48 - 72		10.8
BSS-464	50 - 63	LT	2
BSS-504	34 - 60	LT	2
BSS-544	40 - 68	LT	2
Fifth Layer			
BSS-045A	89 - 103		7.01
BSS-105A	90 - 120		2.17
BSS-115A	96 - 120		8.42
BSS-345	108 - 132	LT	2
BSS-405	96 - 120	LT	4
BSS-465	96 - 120	LT	2
BSS-505	96 - 120		2.8
BSS-545	96 - 120	LT	2

Orangeburg Soil Series

Barium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		12.85
BSS-101	0 - 6		9.2
BSS-111	0 - 6		17.68
BSS-341	0 - 6		28.4
BSS-401	0 - 8		12.87
BSS-461	0 - 10		32
BSS-501	0 - 6		25.8
BSS-541	0 - 6		17.1
Second Layer			
BSS-042A	6 - 25		61.3
BSS-102A	6 - 16		18.4
BSS-112A	6 - 38		48.84
BSS-342	6 - 28		56.6
BSS-402	8 - 20		65.13
BSS-462	10 - 22		77.4
BSS-502	6 - 20		71.6
BSS-542	6 - 24		47.1
Third Layer			
BSS-043A	25 - 34		53.4
BSS-103A	16 - 34		15.4
BSS-343	28 - 48		29
BSS-403	20 - 48		36.99
BSS-463	22 - 50		44.4
BSS-503	20 - 34		52.8
BSS-543	24 - 40		36.6
Fourth Layer			
BSS-044A	34 - 65		36.9
BSS-104A	34 - 60		10.5
BSS-113A	38 - 60		7.308
BSS-114A	60 - 80		22.74
BSS-344	48 - 60		14.2
BSS-404	48 - 72		21.25
BSS-464	50 - 63		28.4
BSS-504	34 - 60		31.6
BSS-544	40 - 68		24.2
Fifth Layer			
BSS-045A	89 - 103		28.6
BSS-105A	90 - 120		34.2
BSS-115A	96 - 120		1.37
BSS-345	108 - 13?		5
BSS-405	96 - 120		13.32
BSS-465	96 - 120		12.8
BSS-505	96 - 120		18.2
BSS-545	96 - 120		8.2

Orangeburg Soil Series

Cadmium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6	LT	0.5
BSS-101	0 - 6	LT	1
BSS-111	0 - 6		1.061
BSS-341	0 - 6	LT	0.6
BSS-401	0 - 8	LT	1
BSS-461	0 - 10	LT	0.6
BSS-501	0 - 6	LT	0.6
BSS-541	0 - 6	LT	0.6
Second Layer			
BSS-042A	6 - 25	LT	0.5
BSS-102A	6 - 16	LT	1
BSS-112A	6 - 38		0.2652
BSS-342	6 - 28	LT	0.6
BSS-402	8 - 20	LT	1
BSS-462	10 - 22	LT	0.6
BSS-502	6 - 20	LT	0.6
BSS-542	6 - 24		0.6
Third Layer			
BSS-043A	25 - 34	LT	1
BSS-103A	16 - 34	LT	1
BSS-343	28 - 48	LT	0.6
BSS-403	20 - 48		0.1175
BSS-463	22 - 50	LT	0.6
BSS-503	20 - 34	LT	0.6
BSS-543	24 - 40	LT	0.6
Fourth Layer			
BSS-044A	34 - 65	LT	0.5
BSS-104A	34 - 60	LT	1
BSS-113A	38 - 60		0.7956
BSS-114A	60 - 80		0.1326
BSS-344	48 - 60	LT	0.6
BSS-404	48 - 72	LT	1
BSS-464	50 - 63	LT	0.6
BSS-504	34 - 60	LT	0.6
BSS-544	40 - 68	LT	0.6
Fifth Layer			
BSS-045A	89 - 103	LT	0.5
BSS-105A	90 - 120	LT	1
BSS-115A	96 - 120		0.5304
BSS-345	108 - 132	LT	0.6
BSS-405	96 - 120		0.1175
BSS-465	96 - 120	LT	0.6
BSS-505	96 - 120	LT	0.6
BSS-545	96 - 120	LT	0.6

Orangeburg Soil Series

Chromium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		4.13
BSS-101	0 - 6		5.82
BSS-111	0 - 6		14.67
BSS-341	0 - 6		7
BSS-401	0 - 8		4.367
BSS-461	0 - 10		7
BSS-501	0 - 6		4.8
BSS-541	0 - 6		4.9
Second Layer			
BSS-042A	6 - 25		16.1
BSS-102A	6 - 16		9.7
BSS-112A	6 - 38		32.36
BSS-342	6 - 28		14.8
BSS-402	8 - 20		15.99
BSS-462	10 - 22		15
BSS-502	6 - 20		13.2
BSS-542	6 - 24		13.9
Third Layer			
BSS-043A	25 - 34		18
BSS-103A	16 - 34		27
BSS-343	28 - 48		24
BSS-403	20 - 48		25.67
BSS-463	22 - 50		16.4
BSS-503	20 - 34		17.4
BSS-543	24 - 40		21.6
Fourth Layer			
BSS-044A	34 - 65		20.7
BSS-104A	34 - 60		28
BSS-113A	38 - 60		12.75
BSS-114A	60 - 80		45.21
BSS-344	48 - 60		23.4
BSS-404	48 - 72		27.32
BSS-464	50 - 63		24.2
BSS-504	34 - 60		22.8
BSS-544	40 - 68		22.5
Fifth Layer			
BSS-045A	89 - 103		35.3
BSS-105A	90 - 120		8.8
BSS-115A	96 - 120		51.97
BSS-345	108 - 132		31.2
BSS-405	96 - 120		46.68
BSS-465	96 - 120		38.2
BSS-505	96 - 120		22.6
BSS-545	96 - 120		31.3

Orangeburg Soil Series

Copper

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		0.7
BSS-101	0 - 6		10.9
BSS-111	0 - 6		3.406
BSS-341	0 - 6		2.2
BSS-401	0 - 8		1.463
BSS-461	0 - 10		3.6
BSS-501	0 - 6		2
BSS-541	0 - 6		2.1
Second Layer			
BSS-042A	6 - 25		3.59
BSS-102A	6 - 16		4.72
BSS-112A	6 - 38		11.43
BSS-342	6 - 28		5
BSS-402	8 - 20		5.17
BSS-462	10 - 22		7.8
BSS-502	6 - 20		6.8
BSS-542	6 - 24		4.5
Third Layer			
BSS-043A	25 - 34		3.2
BSS-103A	16 - 34		4.72
BSS-343	28 - 48		5.8
BSS-403	20 - 48		6.252
BSS-463	22 - 50		7.2
BSS-503	20 - 34		6.2
BSS-543	24 - 40		5.4
Fourth Layer			
BSS-044A	34 - 65		3.23
BSS-104A	34 - 60		8
BSS-113A	38 - 60		3.834
BSS-114A	60 - 80		14.12
BSS-344	48 - 60		6.6
BSS-404	48 - 72		5.519
BSS-464	50 - 63		8.2
BSS-504	34 - 60		8.2
BSS-544	40 - 68		6.9
Fifth Layer			
BSS-045A	89 - 103		8.19
BSS-105A	90 - 120		3.8
BSS-115A	96 - 120		9.904
BSS-345	108 - 132		3
BSS-405	96 - 120		6.238
BSS-465	96 - 120		8
BSS-505	96 - 120		7.4
BSS-545	96 - 120		6.6

Orangeburg Soil Series

Iron

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		4540
BSS-101	0 - 6		3230
BSS-111	0 - 6		8526
BSS-341	0 - 6		3576.4
BSS-401	0 - 8		4986
BSS-461	0 - 10		3208.8
BSS-501	0 - 6		2621.4
BSS-541	0 - 6		2067.1
Second Layer			
BSS-042A	6 - 25		24600
BSS-102A	6 - 16		8660
BSS-112A	6 - 38		17300
BSS-342	6 - 28		11990
BSS-402	8 - 20		11660
BSS-462	10 - 22		9764
BSS-502	6 - 20		11959
BSS-542	6 - 24		7003.1
Third Layer			
BSS-043A	25 - 34		12660
BSS-103A	16 - 34		28600
BSS-343	28 - 48		18579
BSS-403	20 - 48		14990
BSS-463	22 - 50		11395.8
BSS-503	20 - 34		16749
BSS-543	24 - 40		15525
Fourth Layer			
BSS-044A	34 - 65		34400
BSS-104A	34 - 60		35800
BSS-113A	38 - 60		7502
BSS-114A	60 - 80		27510
BSS-344	48 - 60		19131
BSS-404	48 - 72		20090
BSS-464	50 - 63		16699.4
BSS-504	34 - 60		22028
BSS-544	40 - 68		16981
Fifth Layer			
BSS-045A	89 - 103		62600
BSS-105A	90 - 120		15300
BSS-115A	96 - 120		30170
BSS-345	108 - 132		15642
BSS-405	96 - 120		25010
BSS-465	96 - 120		39468
BSS-505	96 - 120		20972
BSS-545	96 - 120		27941

Orangeburg Soil Series

Lead

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		3.96
BSS-101	0 - 6		5.15
BSS-111	0 - 6		9.04
BSS-341	0 - 6		6.4
BSS-401	0 - 8		6.72
BSS-461	0 - 10		5.6
BSS-501	0 - 6		4.3
BSS-541	0 - 6		6
Second Layer			
BSS-042A	6 - 25		11.4
BSS-102A	6 - 16		6.52
BSS-112A	6 - 38		15.4
BSS-342	6 - 28		7.9
BSS-402	8 - 20		14.5
BSS-462	10 - 22		7.3
BSS-502	6 - 20		5.4
BSS-542	6 - 24		9.2
Third Layer			
BSS-043A	25 - 34		11.6
BSS-103A	16 - 34		9.53
BSS-343	28 - 48		7.8
BSS-403	20 - 48		7.66
BSS-463	22 - 50		8
BSS-503	20 - 34		4.1
BSS-543	24 - 40		6.1
Fourth Layer			
BSS-044A	34 - 65		13.1
BSS-104A	34 - 60		6.6
BSS-113A	38 - 60		4.89
BSS-114A	60 - 80	LT	12.7
BSS-344	48 - 60		6.3
BSS-404	48 - 72		9.76
BSS-464	50 - 63		11.9
BSS-504	34 - 60		7
BSS-544	40 - 68		6.9
Fifth Layer			
BSS-045A	89 - 103		14
BSS-105A	90 - 120		4.45
BSS-115A	96 - 120		14.6
BSS-345	108 - 132		3
BSS-405	96 - 120		12.3
BSS-465	96 - 120		9.5
BSS-505	96 - 120		2.8
BSS-545	96 - 120		5.6

Orangeburg Soil Series

Sum

μ: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6	LT	10
BSS-101	0 - 6	LT	10
BSS-111	0 - 6	LT	10
BSS-341	0 - 6	LT	10
BSS-401	0 - 8	LT	10
BSS-461	0 - 10	LT	10
BSS-501	0 - 6	LT	10
BSS-541	0 - 6	LT	10
Second Layer			
BSS-042A	6 - 25		10.82
BSS-102A	6 - 16	LT	10
BSS-112A	6 - 38		19.87
BSS-342	6 - 28	LT	10
BSS-402	8 - 20	LT	10
BSS-462	10 - 22	LT	10
BSS-502	6 - 20	LT	10
BSS-542	6 - 24	LT	10
Third Layer			
BSS-043A	25 - 34	LT	10
BSS-103A	16 - 34	LT	10
BSS-343	28 - 48	LT	10
BSS-403	20 - 48	LT	10
BSS-463	22 - 50	LT	10
BSS-503	20 - 34	LT	10
BSS-543	24 - 40	LT	10
Fourth Layer			
BSS-044A	34 - 65		14.85
BSS-104A	34 - 60	LT	10
BSS-113A	38 - 60	LT	10
BSS-114A	60 - 80		17.07
BSS-344	48 - 60	LT	10
BSS-404	48 - 72	LT	10
BSS-464	50 - 63	LT	10
BSS-504	34 - 60	LT	10
BSS-544	40 - 68	LT	10
Fifth Layer			
BSS-045A	89 - 103	LT	10
BSS-105A	90 - 120	LT	10
BSS-115A	96 - 120	LT	10
BSS-345	108 - 132	LT	10
BSS-405	96 - 120	LT	10
BSS-465	96 - 120	LT	10
BSS-505	96 - 120	LT	10
BSS-545	96 - 120	LT	10

Orangeburg Soil Series

Magnesium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		124.4
BSS-101	0 - 6		74.98
BSS-111	0 - 6		171.5
BSS-341	0 - 6		81.89
BSS-401	0 - 8		110.5
BSS-461	0 - 10		97.18
BSS-501	0 - 6		48.42
BSS-541	0 - 6		61.28
Second Layer			
BSS-042A	6 - 25		591.2
BSS-102A	6 - 16		115.5
BSS-112A	6 - 38		759.4
BSS-342	6 - 28		134.7
BSS-402	8 - 20		456.2
BSS-462	10 - 22		375.3
BSS-502	6 - 20		181.2
BSS-542	6 - 24		163.4
Third Layer			
BSS-043A	25 - 34		398
BSS-103A	16 - 34		135.6
BSS-343	28 - 48		214.5
BSS-403	20 - 48		402.8
BSS-463	22 - 50		205.3
BSS-503	20 - 34		123
BSS-543	24 - 40		111.6
Fourth Layer			
BSS-044A	34 - 65		519.1
BSS-104A	34 - 60		212.8
BSS-113A	38 - 60		120.5
BSS-114A	60 - 80		445.5
BSS-344	48 - 60		162.6
BSS-404	48 - 72		236.8
BSS-464	50 - 63		459.7
BSS-504	34 - 60		136.8
BSS-544	40 - 68		122.9
Fifth Layer			
BSS-045A	89 - 103		241.7
BSS-105A	90 - 120		55.47
BSS-115A	96 - 120		208.5
BSS-345	108 - 132		52.22
BSS-405	96 - 120		281.4
BSS-465	96 - 120		133.5
BSS-505	96 - 120		87.29
BSS-545	96 - 120		94.62

Orangeburg Soil Series

Manganese

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		33.86
BSS-101	0 - 6		18.61
BSS-111	0 - 6		55
BSS-341	0 - 6		78.67
BSS-401	0 - 8		49
BSS-461	0 - 10		103.6
BSS-501	0 - 6		122.3
BSS-541	0 - 6		90
Second Layer			
BSS-042A	6 - 25		50.67
BSS-102A	6 - 16		13.71
BSS-112A	6 - 38		35.47
BSS-342	6 - 28		181.2
BSS-402	8 - 20		78.86
BSS-462	10 - 22		155.7
BSS-502	6 - 20		241.2
BSS-542	6 - 24		125.9
Third Layer			
BSS-043A	25 - 34		24.78
BSS-103A	16 - 34	LT	1.6
BSS-343	28 - 48		23.06
BSS-403	20 - 48		48.92
BSS-463	22 - 50		34.47
BSS-503	20 - 34		72.46
BSS-543	24 - 40		10.88
Fourth Layer			
BSS-044A	34 - 65		24.93
BSS-104A	34 - 60		6.051
BSS-113A	38 - 60		7.583
BSS-114A	60 - 80		31.79
BSS-344	48 - 60		17.31
BSS-404	48 - 72		32.93
BSS-464	50 - 63		31.56
BSS-504	34 - 60		41.9
BSS-544	40 - 68		7.503
Fifth Layer			
BSS-045A	89 - 103		38.72
BSS-105A	90 - 120		3.6
BSS-115A	96 - 120		34.09
BSS-345	108 - 132	LT	1.6
BSS-405	96 - 120		32.67
BSS-465	96 - 120	LT	1.6
BSS-505	96 - 120		35.47
BSS-545	96 - 120		3.6

Orangeburg Soil Series

Mercury

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-041	0	- 6	LT	0.1
BSS-101	0	- 6	LT	0.1
BSS-111	0	- 6	LT	0.1
BSS-341	0	- 6	LT	0.1
BSS-401	0	- 8	LT	0.1
BSS-461	0	- 10	LT	0.1
BSS-501	0	- 6	LT	0.1
BSS-541	0	- 6	LT	0.1
Second Layer				
BSS-042A	6	- 25	LT	0.1
BSS-102A	6	- 16	LT	0.1
BSS-112A	6	- 38	LT	0.1
BSS-342	6	- 28	LT	0.1
BSS-402	8	- 20	LT	0.1
BSS-462	10	- 22	LT	0.1
BSS-502	6	- 20	LT	0.1
BSS-542	6	- 24	LT	0.1
Third Layer				
BSS-043A	25	- 34	LT	0.1
BSS-103A	16	- 34		0.11
BSS-343	28	- 48		0.11
BSS-403	20	- 48	LT	0.1
BSS-463	22	- 50	LT	0.1
BSS-503	20	- 34	LT	0.1
BSS-543	24	- 40	LT	0.1
Fourth Layer				
BSS-044A	34	- 65	LT	0.1
BSS-104A	34	- 60		0.19
BSS-113A	38	- 60	LT	0.1
BSS-114A	60	- 80	LT	0.01
BSS-344	48	- 60	LT	0.1
BSS-404	48	- 72	LT	0.1
BSS-464	50	- 63	LT	0.1
BSS-504	34	- 60	LT	0.1
BSS-544	40	- 68		0.17
Fifth Layer				
BSS-045A	89	- 103	LT	0.1
BSS-105A	90	- 120		0.17
BSS-115A	96	- 120	LT	0.1
BSS-345	108	- 132	LT	0.1
BSS-405	96	- 120	LT	0.1
BSS-465	96	- 120	LT	0.1
BSS-505	96	- 120	LT	0.1
BSS-545	96	- 120	LT	0.1

Orangeburg Soil Series

Nickel

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		3.72
BSS-101	0 - 6	LT	4.2
BSS-111	0 - 6		7.693
BSS-341	0 - 6		4.6
BSS-401	0 - 8		2.498
BSS-461	0 - 10		4
BSS-501	0 - 6		2
BSS-541	0 - 6		2.6
Second Layer			
BSS-042A	6 - 25		10.9
BSS-102A	6 - 16	LT	4.2
BSS-112A	6 - 38		16.78
BSS-342	6 - 28		9.4
BSS-402	8 - 20		8.156
BSS-462	10 - 22		10.8
BSS-502	6 - 20		8.2
BSS-542	6 - 24		5.6
Third Layer			
BSS-043A	25 - 34		11.4
BSS-103A	16 - 34	LT	4.2
BSS-343	28 - 48		5
BSS-403	20 - 48		9.799
BSS-463	22 - 50		8.8
BSS-503	20 - 34		9
BSS-543	24 - 40		5.1
Fourth Layer			
BSS-044A	34 - 65		7.66
BSS-104A	34 - 60		6.3
BSS-113A	38 - 60		7.047
BSS-114A	60 - 80		13.32
BSS-344	48 - 60		6.2
BSS-404	48 - 72		3.809
BSS-464	50 - 63		9.4
BSS-504	34 - 60		9.6
BSS-544	40 - 68		3.8
Fifth Layer			
BSS-045A	89 - 103		15.1
BSS-105A	90 - 120	LT	4.2
BSS-115A	96 - 120		11.44
BSS-345	108 - 132		5.4
BSS-405	96 - 120		13.88
BSS-465	96 - 120		4.6
BSS-505	96 - 120		5.4
BSS-545	96 - 120		3.8

Orangeburg Soil Series

Potassium

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-041	0	- 6	LT	40
BSS-101	0	- 6	LT	325
BSS-111	0	- 6		82.96
BSS-341	0	- 6	LT	180
BSS-401	0	- 8		202
BSS-461	0	- 10	LT	180
BSS-501	0	- 6	LT	180
BSS-541	0	- 6	LT	180
Second Layer				
BSS-042A	6	- 25		150
BSS-102A	6	- 16	LT	325
BSS-112A	6	- 38		477.8
BSS-342	6	- 28		200
BSS-402	8	- 20		29.04
BSS-462	10	- 22		1118
BSS-502	6	- 20	LT	180
BSS-542	6	- 24	LT	180
Third Layer				
BSS-043A	25	- 34	LT	80
BSS-103A	16	- 34	LT	325
BSS-343	28	- 48	LT	180
BSS-403	20	- 48		309.3
BSS-463	22	- 50		308
BSS-503	20	- 34	LT	180
BSS-543	24	- 40	LT	180
Fourth Layer				
BSS-044A	34	- 65		81.9
BSS-104A	34	- 60	LT	325
BSS-113A	38	- 60		66.37
BSS-114A	60	- 80		56.41
BSS-344	48	- 60		280
BSS-404	48	- 72		88.09
BSS-464	50	- 63		170
BSS-504	34	- 60	LT	180
BSS-544	40	- 68		180
Fifth Layer				
BSS-045A	89	- 103		243
BSS-105A	90	- 120	LT	325
BSS-115A	96	- 120		172.6
BSS-345	108	- 132	LT	180
BSS-405	96	- 120		164.1
BSS-465	96	- 120	LT	180
BSS-505	96	- 120	LT	180
BSS-545	96	- 120	LT	180

Orangeburg Soil Series

silver

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6	LT	0.3
BSS-101	0 - 6	LT	0.6
BSS-111	0 - 6	LT	0.6
BSS-341	0 - 6	LT	1
BSS-401	0 - 8	LT	0.6
BSS-461	0 - 10	LT	1
BSS-501	0 - 6	LT	1
BSS-541	0 - 6	LT	1
Second Layer			
BSS-042A	6 - 25	LT	0.3
BSS-102A	6 - 16	LT	0.6
BSS-112A	6 - 38	LT	0.6
BSS-342	6 - 28	LT	1
BSS-402	8 - 20	LT	0.6
BSS-462	10 - 22	LT	1
BSS-502	6 - 20	LT	1
BSS-542	6 - 24	LT	1
Third Layer			
BSS-043A	25 - 34	LT	0.6
BSS-103A	16 - 34	LT	0.6
BSS-343	28 - 48	LT	1
BSS-403	20 - 48	LT	0.6
BSS-463	22 - 50	LT	1
BSS-503	20 - 34	LT	1
BSS-543	24 - 40	LT	1
Fourth Layer			
BSS-044A	34 - 65	LT	0.3
BSS-104A	34 - 60	LT	0.6
BSS-113A	38 - 60	LT	0.6
BSS-114A	60 - 80	LT	0.6
BSS-344	48 - 60	LT	1
BSS-404	48 - 72	LT	0.6
BSS-464	50 - 63	LT	1
BSS-504	34 - 60	LT	1
BSS-544	40 - 68	LT	1
Fifth Layer			
BSS-045A	89 - 103	LT	0.3
BSS-105A	90 - 120	LT	0.6
BSS-115A	96 - 120	LT	0.6
BSS-345	108 - 132	LT	1
BSS-405	96 - 120	LT	0.6
BSS-465	96 - 120	LT	1
BSS-505	96 - 120	LT	1
BSS-545	96 - 120	LT	1

Orangeburg Soil Series

Selenium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6	LT	0.2
BSS-101	0 - 6	LT	0.4
BSS-111	0 - 6	LT	0.4
BSS-341	0 - 6	LT	0.4
BSS-401	0 - 8	LT	0.4
BSS-461	0 - 10	LT	0.4
BSS-501	0 - 6	LT	0.4
BSS-541	0 - 6	LT	0.4
Second Layer			
BSS-042A	6 - 25		0.37
BSS-102A	6 - 16	LT	0.4
BSS-112A	6 - 38		0.92
BSS-342	6 - 28		0.55
BSS-402	8 - 20	LT	0.4
BSS-462	10 - 22	LT	0.4
BSS-502	6 - 20	LT	0.4
BSS-542	6 - 24	LT	0.4
Third Layer			
BSS-043A	25 - 34		0.31
BSS-103A	16 - 34		0.42
BSS-343	28 - 48		0.43
BSS-403	20 - 48	LT	0.4
BSS-463	22 - 50	LT	0.4
BSS-503	20 - 34	LT	0.4
BSS-543	24 - 40	LT	0.4
Fourth Layer			
BSS-044A	34 - 65		0.99
BSS-104A	34 - 60	LT	1
BSS-113A	38 - 60		0.49
BSS-114A	60 - 80	LT	1
BSS-344	48 - 60		0.49
BSS-404	48 - 72	LT	0.4
BSS-464	50 - 63		0.47
BSS-504	34 - 60	LT	0.4
BSS-544	40 - 68	LT	4
Fifth Layer			
BSS-045A	89 - 103		0.84
BSS-105A	90 - 120	LT	0.4
BSS-115A	96 - 120	LT	0.4
BSS-345	108 - 132		0.52
BSS-405	96 - 120	LT	0.4
BSS-465	96 - 120		0.72
BSS-505	96 - 120	LT	0.4
BSS-545	96 - 120		0.55

Orangeburg Soil Series

Sodium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		18.3
BSS-101	0 - 6		288
BSS-111	0 - 6		65.34
BSS-341	0 - 6		42
BSS-401	0 - 8		52.03
BSS-461	0 - 10		65.2
BSS-501	0 - 6		44.4
BSS-541	0 - 6		31.4
Second Layer			
BSS-042A	6 - 25		33.9
BSS-102A	6 - 16		210
BSS-112A	6 - 38		78.75
BSS-342	6 - 28		123.6
BSS-402	8 - 20		52.82
BSS-462	10 - 22		93
BSS-502	6 - 20		79.4
BSS-542	6 - 24		42.6
Third Layer			
BSS-043A	25 - 34		41
BSS-103A	16 - 34		760
BSS-343	28 - 48		86.8
BSS-403	20 - 48		72.97
BSS-463	22 - 50		84.4
BSS-503	20 - 34		66.8
BSS-543	24 - 40		49.1
Fourth Layer			
BSS-044A	34 - 65		25.9
BSS-104A	34 - 60		321
BSS-113A	38 - 60		70.64
BSS-114A	60 - 80		88.11
BSS-344	48 - 60		90.2
BSS-404	48 - 72		351
BSS-464	50 - 63		82.2
BSS-504	34 - 60		60.4
BSS-544	40 - 68		44.3
Fifth Layer			
BSS-045A	89 - 103		39.5
BSS-105A	90 - 120		236
BSS-115A	96 - 120		73.76
BSS-345	108 - 132		47.6
BSS-405	96 - 120		55.68
BSS-465	96 - 120		75.2
BSS-505	96 - 120		78
BSS-545	96 - 120		44.3

Orangeburg Soil Series

Zinc

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		11.84
BSS-101	0 - 6		24.6
BSS-111	0 - 6		8.729
BSS-341	0 - 6		10.8
BSS-401	0 - 8		6.306
BSS-461	0 - 10		7.8
BSS-501	0 - 6		6.6
BSS-541	0 - 6		5.2
Second Layer			
BSS-042A	6 - 25		21.3
BSS-102A	6 - 16		16.8
BSS-112A	6 - 38		28.46
BSS-342	6 - 28		22
BSS-402	8 - 20		16.75
BSS-462	10 - 22		19
BSS-502	6 - 20		13.4
BSS-542	6 - 24		12.3
Third Layer			
BSS-043A	25 - 34		18.4
BSS-103A	16 - 34		14.2
BSS-343	28 - 48		9
BSS-403	20 - 48		15.32
BSS-463	22 - 50		15.8
BSS-503	20 - 34		12.2
BSS-543	24 - 40		13.4
Fourth Layer			
BSS-044A	34 - 65		15.6
BSS-104A	34 - 60		18
BSS-113A	38 - 60		23.94
BSS-114A	60 - 80		33.42
BSS-344	48 - 60		9
BSS-404	48 - 72		11.63
BSS-464	50 - 63		14
BSS-504	34 - 60		12.8
BSS-544	40 - 68		9.8
Fifth Layer			
BSS-045A	89 - 103		28.6
BSS-105A	90 - 120		11.2
BSS-115A	96 - 120		22.37
BSS-345	108 - 132		7.4
BSS-405	96 - 120		14.16
BSS-465	96 - 120		7
BSS-505	96 - 120		11.2
BSS-545	96 - 120		9.8

Udorthent Soil Series

Aluminum

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		43320
BSS-132	12 - 24		5934
BSS-201A	0 - 24		21260
BSS-301	0 - 24		16290
BSS-311	0 - 24		7032
BSS-361	0 - 24		14167
BSS-531	0 - 24		6073
BSS-551	0 - 24		4551.6
BSS-581	0 - 24		3391.3
Second Layer			
BSS-133	24 - 36		25540
BSS-202A	24 - 48		19080
BSS-302	24 - 48		13670
BSS-312	24 - 48		7384
BSS-362	24 - 48		18279
BSS-532	24 - 48		5730
BSS-552	24 - 48		3015.7
BSS-582	24 - 48		3756.4
Third Layer			
BSS-203A	48 - 72		4809
BSS-303	48 - 72		16080
BSS-313	48 - 72		11070
BSS-363	48 - 72		11869
BSS-533	48 - 72		8795.4
BSS-553	48 - 72		2899.3
BSS-583	48 - 72		3843.5

Udorthent Soil Series

Arsenic

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		4.47
BSS-132	12 - 24		5.44
BSS-201A	0 - 24		4.45
BSS-301	0 - 24		2.64
BSS-311	0 - 24		1.95
BSS-361	0 - 24	LT	2
BSS-531	0 - 24	LT	2
BSS-551	0 - 24	LT	2
BSS-581	0 - 24		3.6
Second Layer			
BSS-133	24 - 36		3.79
BSS-202A	24 - 48		4.61
BSS-302	24 - 48		3.64
BSS-312	24 - 48		5.93
BSS-362	24 - 48	LT	2
BSS-532	24 - 48	LT	2
BSS-552	24 - 48	LT	2
BSS-582	24 - 48	LT	2
Third Layer			
BSS-203A	48 - 72		4.41
BSS-303	48 - 72		3.75
BSS-313	48 - 72		5.99
BSS-363	48 - 72	LT	2
BSS-533	48 - 72	LT	2
BSS-553	48 - 72	LT	2
BSS-583	48 - 72	LT	2

Udorthent Soil Series

Barium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		9.78
BSS-132	12 - 24		10.7
BSS-201A	0 - 24		10.99
BSS-301	0 - 24		13.12
BSS-311	0 - 24		35.73
BSS-361	0 - 24		7.2
BSS-531	0 - 24		9
BSS-551	0 - 24		2.3
BSS-581	0 - 24		2
Second Layer			
BSS-133	24 - 36		3.48
BSS-202	24 - 48		10.37
BSS-302	24 - 48		8.2
BSS-312	24 - 48		34.48
BSS-362	24 - 48		13.2
BSS-532	24 - 48		6.2
BSS-552	24 - 48		1.4
BSS-582	24 - 48		1.6
Third Layer			
BSS-203A	48 - 72		2.936
BSS-303	48 - 72		13.74
BSS-313	48 - 72		7.183
BSS-363	48 - 72		6.4
BSS-533	48 - 72		9.4
BSS-553	48 - 72		1.7
BSS-583	48 - 72		1.3

Udorthent Soil Series

Cadmium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	0.5
BSS-132	12 - 24	LT	0.5
BSS-201A	0 - 24		0.5304
BSS-301	0 - 24		0.3978
BSS-311	0 - 24		1.193
BSS-361	0 - 24	LT	0.6
BSS-531	0 - 24	LT	0.6
BSS-551	0 - 24	LT	0.6
BSS-581	0 - 24	LT	0.6
Second Layer			
BSS-133	24 - 36	LT	0.5
BSS-202A	24 - 48		0.5304
BSS-302	24 - 48	LT	1
BSS-312	24 - 48		0.2652
BSS-362	24 - 48	LT	0.6
BSS-532	24 - 48	LT	0.6
BSS-552	24 - 48	LT	0.6
BSS-582	24 - 48	LT	0.6
Third Layer			
BSS-203A	48 - 72		0.5967
BSS-303	48 - 72		0.663
BSS-313	48 - 72		0.5304
BSS-363	48 - 72	LT	0.6
BSS-533	48 - 72	LT	0.6
BSS-553	48 - 72	LT	0.6
BSS-583	48 - 72	LT	0.6

Udorthent Soil Series

Chromium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		27.3
BSS-132	12 - 24		28
BSS-201A	0 - 24		27.15
BSS-301	0 - 24		26.05
BSS-311	0 - 24		10.42
BSS-361	0 - 24		26.6
BSS-531	0 - 24		15.4
BSS-551	0 - 24		21.4
BSS-581	0 - 24		10.7
Second Layer			
BSS-133	24 - 36		24.4
BSS-202A	24 - 48		23.72
BSS-302	24 - 48		15.8
BSS-312	24 - 48		31.95
BSS-362	24 - 48		21.2
BSS-532	24 - 48		19.8
BSS-552	24 - 48		7.3
BSS-582	24 - 48		9
Third Layer			
BSS-203A	48 - 72		5.485
BSS-303	48 - 72		16.73
BSS-313	48 - 72		34.21
BSS-363	48 - 72		22.6
BSS-533	48 - 72		19.4
BSS-553	48 - 72		10.8
BSS-583	48 - 72		14.6

Udorthent Soil Series

Copper

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		1.57
BSS-132	12 - 24		1.99
BSS-201A	0 - 24		8.016
BSS-301	0 - 24		5.696
BSS-311	0 - 24		5.568
BSS-361	0 - 24		5
BSS-531	0 - 24		3.8
BSS-551	0 - 24		3.5
BSS-581	0 - 24		1.9
Second Layer			
BSS-133	24 - 36		1.85
BSS-202A	24 - 48		8.642
BSS-302	24 - 48		2.3
BSS-312	24 - 48		10.69
BSS-362	24 - 48		6.4
BSS-532	24 - 48		4
BSS-552	24 - 48		1.3
BSS-582	24 - 48		2
Third Layer			
BSS-203A	48 - 72		3.172
BSS-303	48 - 72		5.183
BSS-313	48 - 72		4.348
BSS-363	48 - 72		5.4
BSS-533	48 - 72		4
BSS-553	48 - 72		2.1
BSS-583	48 - 72		1.9

Udorthent Soil Series

Iron

Unit: microgram/gram

First Layer	Interval(inches)	Modifier	Result
BSS-131	0 - 12		35400
BSS-132	12 - 24		34200
BSS-201A	0 - 24		25730
BSS-301	0 - 24		18000
BSS-311	0 - 24		3637
BSS-361	0 - 24		21464
BSS-531	0 - 24		12566
BSS-551	0 - 24		8575.6
BSS-581	0 - 24		9303.2
Second Layer			
BSS-133	24 - 36		30600
BSS-202A	24 - 48		25040
BSS-302	24 - 48		11700
BSS-312	24 - 48		5909
BSS-362	24 - 48		17251
BSS-532	24 - 48		13498
BSS-552	24 - 48		4432.3
BSS-582	24 - 48		8182
Third Layer			
BSS-203A	48 - 72		7731
BSS-303	48 - 72		11590
BSS-313	48 - 72		22430
BSS-363	48 - 72		24140
BSS-533	48 - 72		15487
BSS-553	48 - 72		4799.2
BSS-583	48 - 72		10532

Udorthent Soil Series

Lead

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		3.17
BSS-132	12 - 24		5.26
BSS-201A	0 - 24		7.01
BSS-301	0 - 24		2.55
BSS-311	0 - 24		4.92
BSS-361	0 - 24		11.1
BSS-531	0 - 24		3.3
BSS-551	0 - 24		2.3
BSS-581	0 - 24		3.2
Second Layer			
BSS-133	24 - 36		1.59
BSS-202A	24 - 48		7.83
BSS-302	24 - 48		5.88
BSS-312	24 - 48		13.7
BSS-362	24 - 48		1.8
BSS-532	24 - 48		2
BSS-552	24 - 48		1
BSS-582	24 - 48		1.3
Third Layer			
BSS-203A	48 - 72		8.89
BSS-303	48 - 72		7.75
BSS-313	48 - 72		7.62
BSS-363	48 - 72		3.5
BSS-533	48 - 72		2.2
BSS-553	48 - 72		1.5
BSS-583	48 - 72		1.5

Udorthent Soil Series

Lithium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	10
BSS-132	12 - 24	LT	10
BSS-201A	0 - 24	LT	10
BSS-301	0 - 24	LT	10
BSS-311	0 - 24	LT	10
BSS-361	0 - 24	LT	10
BSS-531	0 - 24	LT	10
BSS-551	0 - 24	LT	10
BSS-581	0 - 24	LT	10
Second Layer			
BSS-133	24 - 36	LT	10
BSS-202A	24 - 48	LT	10
BSS-302	24 - 48	LT	10
BSS-312	24 - 48	LT	10
BSS-362	24 - 48	LT	10
BSS-532	24 - 48	LT	10
BSS-552	24 - 48	LT	10
BSS-582	24 - 48	LT	10
Third Layer			
BSS-203A	48 - 72	LT	10
BSS-303	48 - 72	LT	10
BSS-313	48 - 72	LT	10
BSS-363	48 - 72	LT	10
BSS-533	48 - 72	LT	10
BSS-553	48 - 72	LT	10
BSS-583	48 - 72	LT	10

Udorthent Soil Series

Magnesium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		61.35
BSS-132	12 - 24		104.4
BSS-201A	0 - 24		165.9
BSS-301	0 - 24		209.4
BSS-311	0 - 24		111.5
BSS-361	0 - 24		156.4
BSS-531	0 - 24		94.07
BSS-551	0 - 24		30.85
BSS-581	0 - 24		87.7
Second Layer			
BSS-133	24 - 36		51.22
BSS-202A	24 - 48		159.1
BSS-302	24 - 48		166.6
BSS-312	24 - 48		110.1
BSS-362	24 - 48		44.13
BSS-532	24 - 48		36.24
BSS-552	24 - 48		34.86
BSS-582	24 - 48		31.12
Third Layer			
BSS-203A	48 - 72		43.58
BSS-303	48 - 72		255.4
BSS-313	48 - 72		98.77
BSS-363	48 - 72		57.82
BSS-533	48 - 72		73.87
BSS-553	48 - 72		31.4
BSS-583	48 - 72		24.35

Udorthent Soil Series

Manganese

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		5.63
BSS-132	12 - 24	LT	1.6
BSS-201A	0 - 24	LT	1.6
BSS-301	0 - 24		2.987
BSS-311	0 - 24		2.987
BSS-361	0 - 24		4.979
BSS-531	0 - 24		7.583
BSS-551	0 - 24		3.294
BSS-581	0 - 24		11.87
Second Layer			
BSS-133	24 - 36	LT	1.6
BSS-202A	24 - 48		2.068
BSS-302	24 - 48		10.28
BSS-312	24 - 48		1.762
BSS-362	24 - 48	LT	1.6
BSS-532	24 - 48		2.068
BSS-552	24 - 48		3.524
BSS-582	24 - 48		12.18
Third Layer			
BSS-203A	48 - 72		2.083
BSS-303	48 - 72		4.673
BSS-313	48 - 72	LT	1.6
BSS-363	48 - 72	LT	1.6
BSS-533	48 - 72	LT	1.6
BSS-553	48 - 72		2.834
BSS-583	48 - 72		27.96

Udorthent Soil Series

Mercury

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	0.1
BSS-132	12 - 24	LT	0.1
BSS-201A	0 - 24	LT	0.1
BSS-301	0 - 24	LT	0.1
BSS-311	0 - 24	LT	0.1
BSS-361	0 - 24	LT	0.1
BSS-531	0 - 24	LT	0.1
BSS-551	0 - 24	LT	0.1
BSS-581	0 - 24	LT	0.1
Second Layer			
BSS-133	24 - 36		0.1
BSS-202A	24 - 48	LT	0.1
BSS-302	24 - 48	LT	0.1
BSS-312	24 - 48	LT	0.1
BSS-362	24 - 48	LT	0.1
BSS-532	24 - 48	LT	0.1
BSS-552	24 - 48		0.15
BSS-582	24 - 48	LT	0.1
Third Layer			
BSS-203A	48 - 72	LT	0.1
BSS-303	48 - 72	LT	0.1
BSS-313	48 - 72	LT	0.1
BSS-363	48 - 72	LT	0.1
BSS-533	48 - 72	LT	0.1
BSS-553	48 - 72	LT	0.1
BSS-583	48 - 72	LT	0.1

Udorthent Soil Series

Nickel

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		3.66
BSS-132	12 - 24		3.14
BSS-201A	0 - 24		5.121
BSS-301	0 - 24		3.374
BSS-311	0 - 24		1.983
BSS-361	0 - 24	LT	2
BSS-531	0 - 24	LT	2
BSS-551	0 - 24		2.2
BSS-581	0 - 24	LT	2
Second Layer			
BSS-133	24 - 36		2.29
BSS-202A	24 - 48		8.531
BSS-302	24 - 48	LT	4.2
BSS-312	24 - 48		3.857
BSS-362	24 - 48		5.2
BSS-532	24 - 48	LT	2
BSS-552	24 - 48	LT	2
BSS-582	24 - 48	LT	2
Third Layer			
BSS-203A	48 - 72		2.875
BSS-303	48 - 72		4.956
BSS-313	48 - 72		3.89
BSS-363	48 - 72		5.6
BSS-533	48 - 72	LT	0.2
BSS-553	48 - 72	LT	2
BSS-583	48 - 72		2.8

Udorthent Soil Series

Potassium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		65.8
BSS-132	12 - 24		70.9
BSS-201A	0 - 24		258.8
BSS-301	0 - 24		112.8
BSS-311	0 - 24		43.14
BSS-361	0 - 24	LT	180
BSS-531	0 - 24		206
BSS-551	0 - 24	LT	180
BSS-581	0 - 24	LT	180
Second Layer			
BSS-133	24 - 36	LT	40
BSS-202A	24 - 48		192.5
BSS-302	24 - 48	LT	800
BSS-312	24 - 48		92.92
BSS-362	24 - 48	LT	180
BSS-532	24 - 48		196
BSS-552	24 - 48	LT	180
BSS-582	24 - 48	LT	180
Third Layer			
BSS-203A	48 - 72		152.6
BSS-303	48 - 72		185.8
BSS-313	48 - 72		39.82
BSS-363	48 - 72	LT	180
BSS-533	48 - 72		226
BSS-553	48 - 72	LT	180
BSS-583	48 - 72	LT	180

Udorthent Soil Series

Selenium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		0.44
BSS-132	12 - 24		0.73
BSS-201A	0 - 24	LT	0.4
BSS-301	0 - 24	LT	0.4
BSS-311	0 - 24	LT	0.4
BSS-361	0 - 24		0.5
BSS-531	0 - 24		0.64
BSS-551	0 - 24		0.46
BSS-581	0 - 24	LT	0.4
Second Layer			
BSS-133	24 - 36	LT	0.2
BSS-202A	24 - 48		0.49
BSS-302	24 - 48	LT	1
BSS-312	24 - 48	LT	0.4
BSS-362	24 - 48	LT	0.4
BSS-532	24 - 48	LT	0.4
BSS-552	24 - 48	LT	4
BSS-582	24 - 48		0.77
Third Layer			
BSS-203A	48 - 72	LT	1
BSS-303	48 - 72	LT	0.4
BSS-313	48 - 72	LT	0.4
BSS-363	48 - 72		0.41
BSS-533	48 - 72		0.49
BSS-553	48 - 72	LT	0.4
BSS-583	48 - 72	LT	0.4

Udorthent Soil Series

Silver

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	0.3
BSS-132	12 - 24	LT	0.3
BSS-201A	0 - 24	LT	0.6
BSS-301	0 - 24	LT	0.6
BSS-311	0 - 24	LT	0.6
BSS-361	0 - 24	LT	1
BSS-531	0 - 24	LT	1
BSS-551	0 - 24	LT	1
BSS-581	0 - 24	LT	1
Second Layer			
BSS-133	24 - 36	LT	0.3
BSS-202A	24 - 48	LT	0.6
BSS-302	24 - 48	LT	0.6
BSS-312	24 - 48		0.0111
BSS-362	24 - 48	LT	1
BSS-532	24 - 48	LT	1
BSS-552	24 - 48	LT	1
BSS-582	24 - 48	LT	1
Third Layer			
BSS-203A	48 - 72	LT	0.6
BSS-303	48 - 72	LT	0.6
BSS-313	48 - 72		0.2369
BSS-363	48 - 72	LT	1
BSS-533	48 - 72	LT	1
BSS-553	48 - 72		1.8
BSS-583	48 - 72	LT	1

Udorthent Soil Series

Sodium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		18.5
BSS-132	12 - 24		26.6
BSS-201A	0 - 24		47.25
BSS-301	0 - 24		41.33
BSS-311	0 - 24		76.1
BSS-361	0 - 24		51.8
BSS-531	0 - 24		13.8
BSS-551	0 - 24		24.4
BSS-581	0 - 24		20.5
Second Layer			
BSS-133	24 - 36		14.8
BSS-202A	24 - 48		54.11
BSS-302	24 - 48		37.95
BSS-312	24 - 48		45.69
BSS-362	24 - 48		223.2
BSS-532	24 - 48		65.8
BSS-552	24 - 48		20.5
BSS-582	24 - 48		16.4
Third Layer			
BSS-203A	48 - 72		51.93
BSS-303	48 - 72		42.26
BSS-313	48 - 72		46.32
BSS-363	48 - 72		381.6
BSS-533	48 - 72		31.6
BSS-553	48 - 72		47.5
BSS-583	48 - 72		28.1

Udorthent Soil Series

Zinc

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		23.5
BSS-132	12 - 24		19.3
BSS-201A	0 - 24		10.51
BSS-301	0 - 24		15.12
BSS-311	0 - 24		9.597
BSS-361	0 - 24		5.2
BSS-531	0 - 24		3.8
BSS-551	0 - 24		4.2
BSS-581	0 - 24		1.8
Second Layer			
BSS-133	24 - 36		21.95
BSS-202A	24 - 48		12.05
BSS-302	24 - 48		9.7
BSS-312	24 - 48		30.14
BSS-362	24 - 48		11.4
BSS-532	24 - 48		5.4
BSS-552	24 - 48		4.9
BSS-582	24 - 48		4.7
Third Layer			
BSS-203A	48 - 72		10.46
BSS-303	48 - 72		10.99
BSS-313	48 - 72		7.021
BSS-363	48 - 72		16.4
BSS-533	48 - 72		7.2
BSS-553	48 - 72		4.1
BSS-583	48 - 72		5

Vaucluse Soil Series

Aluminum

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		21510
BSS-241	0 - 22		2826
BSS-471	0 - 12		6435
BSS-591	0 - 23		9194.5
Second Layer			
BSS-122	23 - 65		9345
BSS-242	22 - 59		13286
BSS-472	12 - 38		8353.8
BSS-592	23 - 50		8152.5
Third Layer			
BSS-123	65 - 82		7850
BSS-243	59 - 74		5089
BSS-473	38 - 72		4850.6
BSS-593	50 - 72		4096.2
Fourth Layer			
BSS-124	95 - 119		11330
BSS-244	96 - 120		2592
BSS-474	96 - 120		3559.6
BSS-594	96 - 120		5195.4

Vaucluse Soil Series

Arsenic

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		5.04
BSS-241	0 - 22	LT	1
BSS-471	0 - 12		2
BSS-591	0 - 23	LT	2
Second Layer			
BSS-122	23 - 65		3.34
BSS-242	22 - 59		4.88
BSS-472	12 - 38		2
BSS-592	23 - 50	LT	2
Third Layer			
BSS-123	65 - 82		3.11
BSS-243	59 - 74		2.35
BSS-473	38 - 72	LT	2
BSS-593	50 - 72	LT	2
Fourth Layer			
BSS-124	95 - 119		0.96
BSS-244	96 - 120		1.01
BSS-474	96 - 120	LT	2
BSS-594	96 - 120		6

Vaucluse Soil Series

Barium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		19.1
BSS-241	0 - 22		7.37
BSS-471	0 - 12		5.8
BSS-591	0 - 23		4.9
Second Layer			
BSS-122	23 - 65		4.01
BSS-242	22 - 59		12
BSS-472	12 - 38		7.4
BSS-592	23 - 50		3.5
Third Layer			
BSS-123	65 - 82		2.44
BSS-243	59 - 74		2.936
BSS-473	38 - 72		4.2
BSS-593	50 - 72		1.4
Fourth Layer			
BSS-124	95 - 119		4.51
BSS-244	96 - 120		0.9369
BSS-474	96 - 120		2.4
BSS-594	96 - 120		2.3

Vaucluse Soil Series

Cadmium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23	LT	0.5
BSS-241	0 - 22		0.3978
BSS-471	0 - 12		0.6
BSS-591	0 - 23	LT	0.6
Second Layer			
BSS-122	23 - 65	LT	0.5
BSS-242	22 - 59	LT	1
BSS-472	12 - 38	LT	0.6
BSS-592	23 - 50	LT	0.6
Third Layer			
BSS-123	65 - 82	LT	0.5
BSS-243	59 - 74		0.9945
BSS-473	38 - 72	LT	0.6
BSS-593	50 - 72	LT	0.6
Fourth Layer			
BSS-124	95 - 119	LT	0.5
BSS-244	96 - 120		0.1989
BSS-474	96 - 120	LT	0.6
BSS-594	96 - 120	LT	0.6

Vaucluse Soil Series

Chromium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		24.95
BSS-241	0 - 22		4.388
BSS-471	0 - 12		10
BSS-591	0 - 23		11.9
Second Layer			
BSS-122	23 - 65		30.9
BSS-242	22 - 59		15.9
BSS-472	12 - 38		24.6
BSS-592	23 - 50		10.9
Third Layer			
BSS-123	65 - 82		19.25
BSS-243	59 - 74		6.719
BSS-473	38 - 72		12
BSS-593	50 - 72		4.5
Fourth Layer			
BSS-124	95 - 119		36.6
BSS-244	96 - 120		1.783
BSS-474	96 - 120		7.6
BSS-594	96 - 120		8.4

Vaucluse Soil Series

Copper

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		2.35
BSS-241	0 - 22		1.013
BSS-471	0 - 12		2.6
BSS-591	0 - 23		4.8
Second Layer			
BSS-122	23 - 65		2.14
BSS-242	22 - 59	LT	1
BSS-472	12 - 38		5.2
BSS-592	23 - 50		4.5
Third Layer			
BSS-123	65 - 82		2.85
BSS-243	59 - 74		2.195
BSS-473	38 - 72		3.8
BSS-593	50 - 72		2.1
Fourth Layer			
BSS-124	95 - 119		2.92
BSS-244	96 - 120		1.335
BSS-474	96 - 120		2.6
BSS-594	96 - 120		4.3

Vaucluse Soil Series

Iron

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		33000
BSS-241	0 - 22		2024
BSS-471	0 - 12		6341.8
BSS-591	0 - 23		11637
Second Layer			
BSS-122	23 - 65		3100
BSS-242	22 - 59		13648
BSS-472	12 - 38		15371
BSS-592	23 - 50		11083
Third Layer			
BSS-123	65 - 82		33400
BSS-243	59 - 74		4032
BSS-473	38 - 72		6893.6
BSS-593	50 - 72		5172.3
Fourth Layer			
BSS-124	95 - 119		65600
BSS-244	96 - 120		1790
BSS-474	96 - 120		4531
BSS-594	96 - 120		8133.8

Vaucluse Soil Series

Lead

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		5.7
BSS-241	0 - 22		2.38
BSS-471	0 - 12		3.6
BSS-591	0 - 23		7.2
Second Layer			
BSS-122	23 - 65		3.87
BSS-242	22 - 59		4.82
BSS-472	12 - 38		6.4
BSS-592	23 - 50		3.5
Third Layer			
BSS-123	65 - 82		3.26
BSS-243	59 - 74		4.23
BSS-473	38 - 72		6
BSS-593	50 - 72		4.1
Fourth Layer			
BSS-124	95 - 119		3.18
BSS-244	96 - 120		2.2
BSS-474	96 - 120		4.1
BSS-594	96 - 120		5.5

Vaucluse Soil Series

Lithium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23	LT	10
BSS-241	0 - 22	LT	10
BSS-471	0 - 12	LT	10
BSS-591	0 - 23	LT	10
Second Layer			
BSS-122	23 - 65	LT	10
BSS-242	22 - 59	LT	10
BSS-472	12 - 38	LT	10
BSS-592	23 - 50	LT	10
Third Layer			
BSS-123	65 - 82	LT	10
BSS-243	59 - 74	LT	10
BSS-473	38 - 72	LT	10
BSS-593	50 - 72	LT	10
Fourth Layer			
BSS-124	95 - 119	LT	10
BSS-244	96 - 120	LT	10
BSS-474	96 - 120	LT	10
BSS-594	96 - 120	LT	10

Vaucluse Soil Series

Magnesium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		279.7
BSS-241	0 - 22		77.05
BSS-471	0 - 12		63.49
BSS-591	0 - 23		85.35
Second Layer			
BSS-122	23 - 65		61.31
BSS-242	22 - 59		184.5
BSS-472	12 - 38		111.7
BSS-592	23 - 50		34.03
Third Layer			
BSS-123	65 - 82		23.44
BSS-243	59 - 74		40.53
BSS-473	38 - 72		33.75
BSS-593	50 - 72		20.82
Fourth Layer			
BSS-124	95 - 119		12.87
BSS-244	96 - 120		25.91
BSS-474	96 - 120		40.53
BSS-594	96 - 120		49.66

Vaucluse Soil Series

Manganese

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		18
BSS-241	0 - 22		7.583
BSS-471	0 - 12		4.519
BSS-591	0 - 23		2.145
Second Layer			
BSS-122	23 - 65		3.118
BSS-242	22 - 59	LT	1.6
BSS-472	12 - 38		4.213
BSS-592	23 - 50		3.37
Third Layer			
BSS-123	65 - 82	LT	1.6
BSS-243	59 - 74	LT	1.6
BSS-473	38 - 72		8.043
BSS-593	50 - 72		3.447
Fourth Layer			
BSS-124	95 - 119		4.215
BSS-244	96 - 120	LT	1.6
BSS-474	96 - 120		2.528
BSS-594	96 - 120		8.579

Vaucluse Soil Series

Mercury

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23	LT	0.1
BSS-241	0 - 22	LT	0.01
BSS-471	0 - 12	LT	0.1
BSS-591	0 - 23	LT	0.1
Second Layer			
BSS-122	23 - 65	LT	0.1
BSS-242	22 - 59	LT	0.1
BSS-472	12 - 38	LT	0.1
BSS-592	23 - 50	LT	0.1
Third Layer			
BSS-123	65 - 82	LT	0.1
BSS-243	59 - 74	LT	0.1
BSS-473	38 - 72	LT	0.1
BSS-593	50 - 72	LT	0.1
Fourth Layer			
BSS-124	95 - 119	LT	0.1
BSS-244	96 - 120	LT	0.1
BSS-474	96 - 120	LT	0.1
BSS-594	96 - 120	LT	0.1

Vaucluse Soil Series

Nickel

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		7.46
BSS-241	0 - 22		1.774
BSS-471	0 - 12	LT	2
BSS-591	0 - 23	LT	2
Second Layer			
BSS-122	23 - 65		3.4
BSS-242	22 - 59	LT	4.2
BSS-472	12 - 38		3.4
BSS-592	23 - 50		2.2
Third Layer			
BSS-123	65 - 82		3.55
BSS-243	59 - 74	LT	4.2
BSS-473	38 - 72		3
BSS-593	50 - 72	LT	2
Fourth Layer			
BSS-124	95 - 119		6.84
BSS-244	96 - 120		1.916
BSS-474	96 - 120		2.6
BSS-594	96 - 120	LT	2

Vaucluse Soil Series

Potassium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		44.6
BSS-241	0 - 22		39.82
BSS-471	0 - 12		270
BSS-591	0 - 23	LT	180
Second Layer			
BSS-122	23 - 65		272.4
BSS-242	22 - 59		52
BSS-472	12 - 38		298
BSS-592	23 - 50	LT	180
Third Layer			
BSS-123	65 - 82	LT	40
BSS-243	59 - 74		126.1
BSS-473	38 - 72		324
BSS-593	50 - 72	LT	180
Fourth Layer			
BSS-124	95 - 119	LT	40
BSS-244	96 - 120	LT	326
BSS-474	96 - 120		180
BSS-594	96 - 120	LT	180

Vaucluse Soil Series

Selenium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		0.23
BSS-241	0 - 22	LT	0.4
BSS-471	0 - 12	LT	0.4
BSS-591	0 - 23		0.57
Second Layer			
BSS-122	23 - 65	LT	0.2
BSS-242	22 - 59	LT	1
BSS-472	12 - 38	LT	0.4
BSS-592	23 - 50		0.41
Third Layer			
BSS-123	65 - 82	LT	0.2
BSS-243	59 - 74		0.49
BSS-473	38 - 72	LT	4
BSS-593	50 - 72		0.51
Fourth Layer			
BSS-124	95 - 119	LT	0.2
BSS-244	96 - 120		0.45
BSS-474	96 - 120	LT	0.4
BSS-594	96 - 120	LT	0.4

Vaucluse Soil Series

Silver

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23	LT	0.3
BSS-241	0 - 22	LT	0.6
BSS-471	0 - 12	LT	1
BSS-591	0 - 23	LT	1
Second Layer			
BSS-122	23 - 65	LT	0.3
BSS-242	22 - 59	LT	0.6
BSS-472	12 - 38	LT	1
BSS-592	23 - 50	LT	1
Third Layer			
BSS-123	65 - 82	LT	0.3
BSS-243	59 - 74		0.6854
BSS-473	38 - 72	LT	1
BSS-593	50 - 72	LT	1
Fourth Layer			
BSS-124	95 - 119	LT	0.3
BSS-244	96 - 120	LT	0.6
BSS-474	96 - 120	LT	1
BSS-594	96 - 120	LT	1

Vaucluse Soil Series

Sodium

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		26.6
BSS-241	0 - 22		27.29
BSS-471	0 - 12		46.4
BSS-591	0 - 23		28.7
Second Layer			
BSS-122	23 - 65		32.2
BSS-242	22 - 59		28.8
BSS-472	12 - 38		38
BSS-592	23 - 50		78.5
Third Layer			
BSS-123	65 - 82		14.5
BSS-243	59 - 74		29.63
BSS-473	38 - 72		29.6
BSS-593	50 - 72		59.9
Fourth Layer			
BSS-124	95 - 119		18.6
BSS-244	96 - 120		30.1
BSS-474	96 - 120		42.8
BSS-594	96 - 120		70.3

Vaucluse Soil Series

Zinc

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		18
BSS-241	0 - 22		6.331
BSS-471	0 - 12		11.4
BSS-591	0 - 23		12
Second Layer			
BSS-122	23 - 65		32.7
BSS-242	22 - 59		10.2
BSS-472	12 - 38		6.2
BSS-592	23 - 50		11.2
Third Layer			
BSS-123	65 - 82		267
BSS-243	59 - 74		7.183
BSS-473	38 - 72		7.4
BSS-593	50 - 72		11.1
Fourth Layer			
BSS-124	95 - 119		13.9
BSS-244	96 - 120		6.468
BSS-474	96 - 120		5
BSS-594	96 - 120		11.2

**GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND
SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE**

Appendix C.2

Other Inorganic Data Summary

Blanton Soil Series

Cyanide

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	0.25
BSS-061	0 - 6	LT	0.25
BSS-091	0 - 5	LT	0.25
BSS-231	0 - 7	LT	0.25
BSS-331	0 - 8	LT	0.25
BSS-351	0 - 7	LT	0.25
BSS-431	0 - 6	LT	0.25
BSS-451	0 - 5	LT	0.25
Second Layer			
BSS-012	10 - 65	LT	0.25
BSS-062	6 - 50	LT	0.25
BSS-092A	5 - 52	LT	0.25
BSS-232	7 - 61	LT	0.25
BSS-332	8 - 72	LT	0.25
BSS-352	7 - 60	LT	0.25
BSS-432	6 - 67	LT	0.25
BSS-452	5 - 59	LT	0.25
Third Layer			
BSS-013	65 - 87	LT	0.25
BSS-063	50 - 74	LT	0.25
BSS-093A	52 - 72	LT	0.25
BSS-233	61 - 70	LT	0.25
BSS-333	72 - 84	LT	0.25
BSS-353	60 - 72	LT	0.25
BSS-433	67 - 77	LT	0.25
BSS-453	59 - 72	LT	0.25
Fourth Layer			
BSS-014	111 - 124	LT	0.25
BSS-064	96 - 120	LT	0.25
BSS-094A	96 - 120	LT	0.25
BSS-234	96 - 120	LT	0.25
BSS-334	96 - 120	LT	0.25
BSS-354	96 - 120	LT	0.25
BSS-434	96 - 120	LT	0.25
BSS-454	96 - 120	LT	0.25

Blanton Soil Series

Chloride

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		2.1
BSS-061	0 - 6		7.7
BSS-091	0 - 5		3.8
BSS-231	0 - 7		1.7
BSS-331	0 - 8		7.9
BSS-351	0 - 7		2.5
BSS-431	0 - 6		2.4
BSS-451	0 - 5		3

Second Layer

BSS-012	10 - 65	LT	1.25
BSS-062	6 - 50		1.9
BSS-092A	5 - 52		2.8
BSS-232	7 - 61	LT	1.25
BSS-332	8 - 72		9
BSS-352	7 - 60	LT	1.25
BSS-432	6 - 67		1.6
BSS-452	5 - 59		3.2

Third Layer

BSS-013	65 - 87		1.3
BSS-063	50 - 74		2.6
BSS-093A	52 - 72		8.6
BSS-233	61 - 70	LT	1.25
BSS-333	72 - 84		1.3
BSS-353	60 - 72		1.4
BSS-433	67 - 77		2.6
BSS-453	59 - 72		4.5

Fourth Layer

BSS-014	111 - 124		1.4
BSS-064	96 - 120		2.9
BSS-094A	96 - 120		6.1
BSS-234	96 - 120		1.5
BSS-334	96 - 120		2.4
BSS-354	96 - 120		11.2
BSS-434	96 - 120		1.8
BSS-454	96 - 120		4.6

Blanton Soil Series

Fluoride

Unit: microgram/gram

First Layer	Intervals (inches)	Modifier	Result
BSS-011	0 - 7		1.4
BSS-061	0 - 6	LT	1.25
BSS-091	0 - 5		4.3
BSS-231	0 - 7	LT	1.25
BSS-331	0 - 8		1.7
BSS-351	0 - 7	LT	1.25
BSS-431	0 - 6	LT	1.25
BSS-451	0 - 5	LT	1.25
Second Layer			
BSS-012	10 - 65	LT	1.25
BSS-062	6 - 50	LT	1.25
BSS-092A	5 - 52		3.3
BSS-232	7 - 61	LT	1.25
BSS-332	8 - 72	LT	1.25
BSS-352	7 - 60	LT	1.25
BSS-432	6 - 67	LT	1.25
BSS-452	5 - 59	LT	1.25
Third Layer			
BSS-013	65 - 87	LT	1.25
BSS-063	50 - 74	LT	1.25
BSS-093A	52 - 72		1.5
BSS-233	61 - 70	LT	1.25
BSS-333	72 - 84	LT	1.25
BSS-353	60 - 72	LT	1.25
BSS-433	67 - 77	LT	1.25
BSS-453	59 - 72		1.5
Fourth Layer			
BSS-014	111 - 124	LT	1.25
BSS-064	96 - 120	LT	1.25
BSS-094A	96 - 120		1.3
BSS-234	96 - 120	LT	1.25
BSS-334	96 - 120	LT	1.25
BSS-354	96 - 120	LT	1.25
BSS-434	96 - 120	LT	1.25
BSS-454	96 - 120	LT	1.25

Blanton Soil Series

Nitrate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		5
BSS-061	0 - 6		0.79
BSS-091	0 - 5		1.2
BSS-231	0 - 7	LT	0.5
BSS-331	0 - 8		1.8
BSS-351	0 - 7	LT	0.5
BSS-431	0 - 6		11.6
BSS-451	0 - 5	LT	0.5
Second Layer			
BSS-012	10 - 65		1.1
BSS-062	6 - 50		0.63
BSS-092A	5 - 52		2.5
BSS-232	7 - 61		1.1
BSS-332	8 - 72	LT	0.5
BSS-352	7 - 60	LT	0.5
BSS-432	6 - 67		0.97
BSS-452	5 - 59		0.67
Third Layer			
BSS-013	65 - 87		1
BSS-063	50 - 74		0.83
BSS-093A	52 - 72		1.1
BSS-233	61 - 70	LT	0.5
BSS-333	72 - 84		1.1
BSS-353	60 - 72	LT	0.5
BSS-433	67 - 77		4.4
BSS-453	59 - 72		1.8
Fourth Layer			
BSS-014	111 - 124		1.4
BSS-064	96 - 120	LT	0.5
BSS-094A	96 - 120		1.6
BSS-234	96 - 120	LT	0.5
BSS-334	96 - 120		2.6
BSS-354	96 - 120	LT	0.5
BSS-434	96 - 120		0.76
BSS-454	96 - 120		1.2

Blanton Soil Series

Nitrite

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	1.25
BSS-061	0 - 6	LT	1.25
BSS-091	0 - 5	LT	1.25
BSS-231	0 - 7	LT	1.25
BSS-331	0 - 8	LT	1.25
BSS-351	0 - 7	LT	1.25
BSS-431	0 - 6	LT	1.25
BSS-451	0 - 5	LT	1.25

Second Layer	Interval (inches)	Modifier	Result
BSS-012	10 - 65	LT	1.25
BSS-062	6 - 50	LT	1.25
BSS-092A	5 - 52	LT	1.25
BSS-232	7 - 61	LT	1.25
BSS-332	8 - 72	LT	1.25
BSS-352	7 - 60	LT	1.25
BSS-432	6 - 67	LT	1.25
BSS-452	5 - 59	LT	1.25

Third Layer	Interval (inches)	Modifier	Result
BSS-013	65 - 87	LT	1.25
BSS-063	50 - 74	LT	1.25
BSS-093A	52 - 72	LT	1.25
BSS-233	61 - 70	LT	1.25
BSS-333	72 - 84	LT	1.25
BSS-353	60 - 72	LT	1.25
BSS-433	67 - 77	LT	1.25
BSS-453	59 - 72	LT	1.25

Fourth Layer	Interval (inches)	Modifier	Result
BSS-014	111 - 124	LT	1.25
BSS-064	96 - 120	LT	1.25
BSS-094A	96 - 120	LT	1.25
BSS-234	96 - 120	LT	1.25
BSS-334	96 - 120	LT	1.25
BSS-354	96 - 120	LT	1.25
BSS-434	96 - 120	LT	1.25
BSS-454	96 - 120	LT	1.25

Blanton Soil Series

Phosphate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	5
BSS-061	0 - 6	LT	5
BSS-091	0 - 5	LT	5
BSS-231	0 - 7	LT	5
BSS-331	0 - 8	LT	5
BSS-351	0 - 7	LT	5
BSS-431	0 - 6	LT	5
BSS-451	0 - 5	LT	5
Second Layer			
BSS-012	10 - 65	LT	5
BSS-062	6 - 50	LT	5
BSS-092A	5 - 52	LT	5
BSS-232	7 - 61	LT	5
BSS-332	8 - 72	LT	5
BSS-352	7 - 60	LT	5
BSS-432	6 - 67	LT	5
BSS-452	5 - 59	LT	5
Third Layer			
BSS-013	65 - 87	LT	5
BSS-063	50 - 74	LT	5
BSS-093A	52 - 72	LT	5
BSS-233	61 - 70	LT	5
BSS-333	72 - 84	LT	5
BSS-353	60 - 72	LT	5
BSS-433	67 - 77	LT	12.2
BSS-453	59 - 72	LT	5
Fourth Layer			
BSS-014	111 - 124	LT	5
BSS-064	96 - 120	LT	5
BSS-094A	96 - 120	LT	5
BSS-234	96 - 120	LT	5
BSS-334	96 - 120	LT	5
BSS-354	96 - 120	LT	5
BSS-434	96 - 120	LT	5
BSS-454	96 - 120	LT	5

Blanton Soil Series

Sulfate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		11.7
BSS-061	0 - 6		6.5
BSS-091	0 - 5		15
BSS-231	0 - 7		10
BSS-331	0 - 8		18.2
BSS-351	0 - 7		7.8
BSS-431	0 - 6		6.6
BSS-451	0 - 5		12.1

Second Layer	Interval (inches)	Modifier	Result
BSS-012	10 - 65		7.7
BSS-062	6 - 50		8.8
BSS-092A	5 - 52		16.9
BSS-232	7 - 61		9
BSS-332	8 - 72		13.5
BSS-352	7 - 60		8.8
BSS-432	6 - 67		8.7
BSS-452	5 - 59		16.8

Third Layer	Interval (inches)	Modifier	Result
BSS-013	65 - 87		9.6
BSS-063	50 - 74		5.3
BSS-093A	52 - 72	LT	5
BSS-233	51 - 70		9.4
BSS-333	72 - 84		11.5
BSS-353	60 - 72		14.3
BSS-433	67 - 77		7.1
BSS-453	59 - 72		9.6

Fourth Layer	Interval (inches)	Modifier	Result
BSS-014	111 - 124	LT	5
BSS-064	96 - 120	LT	5
BSS-094A	96 - 120	LT	5
BSS-234	96 - 120		5.2
BSS-334	96 - 120		5.7
BSS-354	96 - 120		14.3
BSS-434	96 - 120	LT	5
BSS-454	96 - 120	LT	5

Fuquay Soil Series

Cyanide

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	0.25
BSS-071	0 - 8	LT	0.25
BSS-081	0 - 6	LT	0.25
BSS-211	0 - 5	LT	0.25
BSS-321	0 - 6	LT	0.25
BSS-421	0 - 9	LT	0.25
BSS-441	0 - 7	LT	0.25
BSS-491	0 - 9	LT	0.25
Second Layer			
BSS-032	10 - 39	LT	0.25
BSS-072A	8 - 36	LT	0.25
BSS-082	6 - 36	LT	0.25
BSS-212A	5 - 47	LT	0.25
BSS-322	6 - 49	LT	0.25
BSS-422	9 - 45	LT	0.25
BSS-442	7 - 38	LT	0.25
BSS-492	9 - 41	LT	0.25
Third Layer			
BSS-033	39 - 72	LT	0.25
BSS-073A	36 - 72	LT	0.25
BSS-083	36 - 72	LT	0.25
BSS-213A	47 - 77	LT	0.25
BSS-323	49 - 72	LT	0.25
BSS-423	45 - 72	LT	0.25
BSS-443	38 - 70	LT	0.25
BSS-493	41 - 72	LT	0.25
Fourth Layer			
BSS-034	96 - 120	LT	0.25
BSS-074A	96 - 120	LT	0.25
BSS-084	96 - 120	LT	0.25
BSS-214A	96 - 120	LT	0.25
BSS-324	96 - 120	LT	0.25
BSS-424	96 - 120	LT	0.25
BSS-444	96 - 120	LT	0.25
BSS-494	96 - 120	LT	0.25

Fuquay Soil Series

Chloride

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		2.1
BSS-071	0 - 8		5
BSS-081	0 - 6		5.4
BSS-211	0 - 5		3.7
BSS-321	0 - 6		2.1
BSS-421	0 - 9		4.6
BSS-441	0 - 7		3
BSS-491	0 - 9		2.1

Second Layer

BSS-032	10 - 39	LT	1.25
BSS-072A	8 - 36		1.9
BSS-082	6 - 36		2.4
BSS-212A	5 - 47	LT	1.25
BSS-322	6 - 49	LT	1.25
BSS-422	9 - 45		3.2
BSS-442	7 - 38		1.8
BSS-492	9 - 41	LT	1.25

Third Layer

BSS-033	39 - 72		1.4
BSS-073A	36 - 72		9.1
BSS-083	36 - 72		2.1
BSS-213A	47 - 77		2
BSS-323	49 - 72		10.7
BSS-423	45 - 72		5.1
BSS-443	38 - 70		3.9
BSS-493	41 - 72		2.8

Fourth Layer

BSS-034	96 - 120		2.3
BSS-074A	96 - 120		5.9
BSS-084	96 - 120		2
BSS-214A	96 - 120		2.3
BSS-324	96 - 120		1.8
BSS-424	96 - 120		5.6
BSS-444	96 - 120		6.1
BSS-494	96 - 120		2.9

Fuquay Soil Series

Fluoride

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	1.25
BSS-071	0 - 8	LT	1.25
BSS-081	0 - 6	LT	1.25
BSS-211	0 - 5	LT	1.25
BSS-321	0 - 6	LT	1.25
BSS-421	0 - 9		2.3
BSS-441	0 - 7		1.9
BSS-491	0 - 9	LT	1.25
Second Layer			
BSS-032	10 - 39	LT	1.25
BSS-072A	8 - 36	LT	1.25
BSS-082	6 - 36	LT	1.25
BSS-212A	5 - 47	LT	1.25
BSS-322	6 - 49	LT	1.25
BSS-422	9 - 45	LT	1.25
BSS-442	7 - 38	LT	1.25
BSS-492	9 - 41	LT	1.25
Third Layer			
BSS-033	39 - 72	LT	1.25
BSS-073A	36 - 72	LT	1.25
BSS-083	36 - 72	LT	1.25
BSS-213A	47 - 77	LT	1.25
BSS-323	49 - 72	LT	1.25
BSS-423	45 - 72	LT	1.25
BSS-443	38 - 70		1.4
BSS-493	41 - 72	LT	1.25
Fourth Layer			
BSS-034	96 - 120	LT	1.25
BSS-074A	96 - 120	LT	1.25
BSS-084	96 - 120	LT	1.25
BSS-214A	96 - 120	LT	1.25
BSS-324	96 - 120	LT	1.25
BSS-424	96 - 120	LT	1.25
BSS-444	96 - 120	LT	1.25
BSS-494	96 - 120	LT	1.25

Fuquay Soil Series

Nitrate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		1.2
BSS-071	0 - 8		1
BSS-081	0 - 6		0.89
BSS-211	0 - 5	LT	0.5
BSS-321	0 - 6	LT	0.5
BSS-421	0 - 9		2.2
BSS-441	0 - 7	LT	0.5
BSS-491	0 - 9		1
Second Layer			
BSS-032	10 - 39		1.2
BSS-072A	8 - 36		0.99
BSS-082	6 - 36		1.1
BSS-212A	5 - 47	LT	0.5
BSS-322	6 - 49		0.67
BSS-422	9 - 45		2
BSS-442	7 - 38		0.9
BSS-492	9 - 41		1.6
Third Layer			
BSS-033	39 - 72		1.2
BSS-073A	36 - 72		0.78
BSS-083	36 - 72		0.73
BSS-213A	47 - 77		1.4
BSS-323	49 - 72		2.3
BSS-423	45 - 72		1.4
BSS-443	38 - 70		2.1
BSS-493	41 - 72	LT	0.5
Fourth Layer			
BSS-034	96 - 120		0.94
BSS-074A	96 - 120	LT	0.5
BSS-084	96 - 120		0.78
BSS-214A	96 - 120	LT	0.5
BSS-324	96 - 120	LT	0.5
BSS-424	96 - 120		1.2
BSS-444	96 - 120		1.4
BSS-494	96 - 120		2.3

Fuquay Soil Series

Nitrite

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	1.25
BSS-071	0 - 8	LT	1.25
BSS-081	0 - 6	LT	1.25
BSS-211	0 - 5	LT	1.25
BSS-321	0 - 6	LT	1.25
BSS-421	0 - 9	LT	1.25
BSS-441	0 - 7	LT	1.25
BSS-491	0 - 9	LT	1.25
Second Layer			
BSS-032	10 - 39	LT	1.25
BSS-072A	8 - 36	LT	1.25
BSS-082	6 - 36	LT	1.25
BSS-212A	5 - 47	LT	1.25
BSS-322	6 - 49	LT	1.25
BSS-422	9 - 45	LT	1.25
BSS-442	7 - 38	LT	1.25
BSS-492	9 - 41	LT	1.25
Third Layer			
BSS-033	39 - 72	LT	1.25
BSS-073A	36 - 72	LT	1.25
BSS-083	36 - 72	LT	1.25
BSS-213A	47 - 77	LT	1.25
BSS-323	49 - 72	LT	1.25
BSS-423	45 - 72	LT	1.25
BSS-443	38 - 70	LT	1.25
BSS-493	41 - 72	LT	1.25
Fourth Layer			
BSS-034	96 - 120	LT	1.25
BSS-074A	96 - 120	LT	1.25
BSS-084	96 - 120	LT	1.25
BSS-214A	96 - 120	LT	1.25
BSS-324	96 - 120	LT	1.25
BSS-424	96 - 120	LT	1.25
BSS-444	96 - 120	LT	1.25
BSS-494	96 - 120	LT	1.25

Fuquay Soil Series

Phosphate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	5
BSS-071	0 - 8	LT	5
BSS-081	0 - 6	LT	5
BSS-211	0 - 5	LT	5
BSS-321	0 - 6	LT	5
BSS-421	0 - 9	LT	5
BSS-441	0 - 7	LT	5
BSS-491	0 - 9	LT	5
Second Layer			
BSS-032	10 - 39	LT	5
BSS-072A	8 - 36	LT	5
BSS-082	6 - 36	LT	5
BSS-212A	5 - 47	LT	5
BSS-322	6 - 49	LT	5
BSS-422	9 - 45	LT	5
BSS-442	7 - 38	LT	5
BSS-492	9 - 41		9.2
Third Layer			
BSS-033	39 - 72	LT	5
BSS-073A	36 - 72	LT	5
BSS-083	36 - 72	LT	5
BSS-213A	47 - 77	LT	5
BSS-323	49 - 72	LT	5
BSS-423	45 - 72	LT	5
BSS-443	38 - 70		7.5
BSS-493	41 - 72	LT	5
Fourth Layer			
BSS-034	96 - 120	LT	5
BSS-074A	96 - 120	LT	5
BSS-084	96 - 120	LT	5
BSS-214A	96 - 120	LT	5
BSS-324	96 - 120	LT	5
BSS-424	96 - 120	LT	5
BSS-444	96 - 120	LT	5
BSS-494	96 - 120		12

Fuquay Soil Series

Sulfate

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-031	0	- 6		6.4
BSS-071	0	- 8		8.7
BSS-081	0	- 6		15.4
BSS-211	0	- 5		10.1
BSS-321	0	- 6		10.5
BSS-421	0	- 9		19.5
BSS-441	0	- 7		10.2
BSS-491	0	- 9		8.1
Second Layer				
BSS-032	10	- 39		8.4
BSS-072A	8	- 36		19.2
BSS-082	6	- 36		14.3
BSS-212A	5	- 47		11.3
BSS-322	6	- 49		7.3
BSS-422	9	- 45		14.8
BSS-442	7	- 38		10.7
BSS-492	9	- 41		10.9
Third Layer				
BSS-033	39	- 72		5.6
BSS-073A	36	- 72		7.2
BSS-083	36	- 72	LT	5
BSS-213A	47	- 77		6.4
BSS-323	49	- 72		10.5
BSS-423	45	- 72	LT	5
BSS-443	38	- 70		6.5
BSS-493	41	- 72		4.4
Fourth Layer				
BSS-034	96	- 120	LT	5
BSS-074A	96	- 120	LT	5
BSS-084	96	- 120	LT	5
BSS-214A	96	- 120	LT	5
BSS-324	96	- 120		10.5
BSS-424	96	- 120	LT	5
BSS-444	96	- 120	LT	5
BSS-494	96	- 120	LT	5

Lakeland Soil Series

Cyanide

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8	LT	0.25
BSS-221	0	-	7	LT	0.25
BSS-411	0	-	5	LT	0.25
BSS-481	0	-	4	LT	0.25
BSS-511	0	-	5	LT	0.25
BSS-521	0	-	5	LT	0.25
BSS-561	0	-	5	LT	0.25
BSS-571	0	-	9	LT	0.25
Second Layer					
BSS-022	9	-	84	LT	0.25
BSS-222A	7	-	80	LT	0.25
BSS-412	5	-	80	LT	0.25
BSS-482	4	-	80	LT	0.25
BSS-512	5	-	80	LT	0.25
BSS-522	5	-	80	LT	0.25
BSS-562	5	-	80	LT	0.25
BSS-572	9	-	80	LT	0.25
Third Layer					
BSS-023	110	-	124	LT	0.25
BSS-223A	96	-	120	LT	0.25
BSS-413	96	-	120	LT	0.5
BSS-483	96	-	120	LT	0.25
BSS-513	96	-	120	LT	0.25
BSS-523	96	-	120	LT	0.25
BSS-563	96	-	120	LT	0.25
BSS-573	96	-	120	LT	0.25

Lakeland Soil Series

Chloride

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-021	0	- 8		5.2
BSS-221	0	- 7		2.3
DSS-411	0	- 5		5.1
BSS-481	0	- 4		6.6
BSS-511	0	- 5		2.1
BSS-521	0	- 5		4.8
BSS-561	0	- 5		3
BSS-571	0	- 9		118.4
Second Layer				
BSS-022	9	- 84		5.2
BSS-222A	7	- 80	LT	1.25
BSS-412	5	- 80		3.7
BSS-482	4	- 80		2.5
BSS-512	5	- 80		2.2
BSS-522	5	- 80		3.6
BSS-562	5	- 80		5.6
BSS-572	9	- 80	LT	1.25
Third Layer				
BSS-023	110	- 124		1.3
BSS-223A	96	- 120	LT	1.25
BSS-413	96	- 120	LT	1.25
BSS-483	96	- 120		8.7
BSS-513	96	- 120		1.8
BSS-523	96	- 120		50.9
BSS-563	96	- 120		3.5
BSS-573	96	- 120		1.4

Lakeland Soil Series

Fluoride

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8	LT	1.25
BSS-221	0	-	7	LT	1.25
BSS-411	0	-	5	LT	1.25
BSS-481	0	-	4	LT	1.25
BSS-511	0	-	5	LT	1.25
BSS-521	0	-	5	LT	1.25
BSS-561	0	-	5		1.4
BSS-571	0	-	9	LT	1.25
Second Layer					
BSS-022	9	-	84	LT	1.25
BSS-222A	7	-	80	LT	1.25
BSS-412	5	-	80		1.6
BSS-482	4	-	80	LT	1.25
BSS-512	5	-	80	LT	1.25
BSS-522	5	-	80	LT	1.25
BSS-562	5	-	80	LT	1.25
BSS-572	9	-	80	LT	1.25
Third Layer					
BSS-023	110	-	124	LT	1.25
BSS-223A	96	-	120	LT	1.25
BSS-413	96	-	120	LT	1.25
BSS-483	96	-	120	LT	1.25
BSS-513	96	-	120	LT	1.25
BSS-523	96	-	120	LT	1.25
BSS-563	96	-	120	LT	1.25
BSS-573	96	-	120	LT	1.25

Lakeland Soil Series

Nitrate

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-021	0	- 8		1.2
BSS-221	0	- 7		0.73
BSS-411	0	- 5		6.2
BSS-481	0	- 4		2.7
BSS-511	0	- 5		44.4
BSS-521	0	- 5		0.85
BSS-561	0	- 5		0.88
BSS-571	0	- 9		1.8
Second Layer				
BSS-022	9	- 84		1.3
BSS-222A	7	- 80		1.3
BSS-412	5	- 80	LT	0.5
BSS-482	4	- 80		1.1
BSS-512	5	- 80		0.8
BSS-522	5	- 80	LT	0.5
BSS-562	5	- 80		1.9
BSS-572	9	- 80	LT	0.5
Third Layer				
BSS-023	110	- 124		1.2
BSS-223A	96	- 120	LT	0.5
BSS-413	96	- 120	LT	0.5
BSS-483	96	- 120		3.2
BSS-513	96	- 120		2.2
BSS-523	96	- 120		2.3
BSS-563	96	- 120	LT	0.5
BSS-573	96	- 120	LT	0.5

Lakeland Soil Series

Nitrite

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8	LT	1.25
BSS-221	0	-	7	LT	1.25
BSS-411	0	-	5	LT	1.25
BSS-481	0	-	4	LT	1.25
BSS-511	0	-	5	LT	1.25
BSS-521	0	-	5	LT	1.25
BSS-561	0	-	5	LT	1.25
BSS-571	0	-	9	LT	1.25
Second Layer					
BSS-022	9	-	84	LT	1.25
BSS-222A	7	-	80	LT	1.25
BSS-412	5	-	80	LT	1.25
BSS-482	4	-	80	LT	1.25
BSS-512	5	-	80	LT	1.25
BSS-522	5	-	80	LT	1.25
BSS-562	5	-	80	LT	1.25
BSS-572	9	-	80	LT	1.25
Third Layer					
BSS-023	110	-	124	LT	1.25
BSS-223A	96	-	120	LT	1.25
BSS-413	96	-	120	LT	1.25
BSS-483	96	-	120	LT	1.25
BSS-513	96	-	120	LT	1.25
BSS-523	96	-	120	LT	1.25
BSS-563	96	-	120	LT	1.25
BSS-573	96	-	120	LT	1.25

Lakeland Soil Series

Phosphate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-021	0 - 8	LT	5
BSS-221	0 - 7	LT	5
BSS-411	0 - 5	LT	5
BSS-481	0 - 4	LT	5
BSS-511	0 - 5	LT	5
BSS-521	0 - 5	LT	5
BSS-561	0 - 5	LT	5
BSS-571	0 - 9	LT	5
Second Layer			
BSS-022	9 - 84	LT	5
BSS-222A	7 - 80		9.7
BSS-412	5 - 80	LT	5
BSS-482	4 - 80	LT	5
BSS-512	5 - 80	LT	5
BSS-522	5 - 80	LT	5
BSS-562	5 - 80	LT	5
BSS-572	9 - 80	LT	5
Third Layer			
BSS-023	110 - 124	LT	5
BSS-223A	96 - 120	LT	5
BSS-413	96 - 120	LT	5
BSS-483	96 - 120		13.7
BSS-513	96 - 120	LT	5
BSS-523	96 - 120	LT	5
BSS-563	96 - 120	LT	5
BSS-573	96 - 120	LT	5

Lakeland Soil Series

Sulfate

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8		18.1
BSS-221	0	-	7		11.2
BSS-411	0	-	5		13.5
BSS-481	0	-	4		7.6
BSS-511	0	-	5		7.1
BSS-521	0	-	5		8.1
BSS-561	0	-	5		11.2
BSS-571	0	-	9		19.9
Second Layer					
BSS-022	9	-	84		10.8
BSS-222A	7	-	80		9.7
BSS-412	5	-	80		8.7
BSS-482	4	-	80		8.2
BSS-512	5	-	80		11.3
BSS-522	5	-	80		7.4
BSS-562	5	-	80		8.2
BSS-572	9	-	80		8.3
Third Layer					
BSS-023	110	-	124		5.5
BSS-223A	96	-	120		12
BSS-413	96	-	120		12.7
BSS-483	96	-	120		17.8
BSS-513	96	-	120		11
BSS-523	96	-	120	LT	5
BSS-563	96	-	120		11.7
BSS-573	96	-	120		9.1

Orangeburg Soil Series

Cyanide

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6	LT	0.25
BSS-101	0 - 6	LT	0.25
BSS-111	0 - 6	LT	0.25
BSS-341	0 - 6	LT	0.25
BSS-401	0 - 8	LT	0.25
BSS-461	0 - 10	LT	0.25
BSS-501	0 - 6	LT	0.25
BSS-541	0 - 6	LT	0.25
Second Layer			
BSS-042A	6 - 25	LT	0.25
BSS-102A	6 - 16	LT	0.25
BSS-112A	6 - 38	LT	0.25
BSS-342	6 - 28	LT	0.25
BSS-402	8 - 20	LT	0.25
BSS-462	10 - 22	LT	0.25
BSS-502	6 - 20	LT	0.25
BSS-542	6 - 24	LT	0.25
Third Layer			
BSS-043A	25 - 34	LT	0.25
BSS-103A	16 - 34	LT	0.25
BSS-343	28 - 48	LT	0.25
BSS-403	20 - 48	LT	0.25
BSS-463	22 - 50	LT	0.25
BSS-503	20 - 34	LT	0.25
BSS-543	24 - 40	LT	0.25
Fourth Layer			
BSS-044A	34 - 65	LT	0.25
BSS-104A	34 - 60	LT	0.25
BSS-113A	38 - 60	LT	0.25
BSS-114A	60 - 80	LT	0.25
BSS-344	48 - 60	LT	0.25
BSS-404	48 - 72	LT	0.25
BSS-464	50 - 63	LT	0.25
BSS-504	34 - 60	LT	0.25
BSS-544	40 - 68	LT	0.25
Fifth Layer			
BSS-045A	89 - 103	LT	0.25
BSS-105A	90 - 120	LT	0.25
BSS-115A	96 - 120	LT	0.25
BSS-345	108 - 132	LT	0.25
BSS-405	96 - 120	LT	0.25
BSS-465	96 - 120	LT	0.25
BSS-505	96 - 120	LT	0.25
BSS-545	96 - 120	LT	0.25

Orangeburg Soil Series

Chloride

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		2
BSS-101	0 - 6		3.2
BSS-111	0 - 6		4.9
BSS-341	0 - 6		3.3
BSS-401	0 - 8		78.5
BSS-461	0 - 10		4.3
BSS-501	0 - 6		2.1
BSS-541	0 - 6		2.6
Second Layer			
BSS-042A	6 - 25		1.4
BSS-102A	6 - 16		1.1
BSS-112A	6 - 38		1.6
BSS-342	6 - 28		1.3
BSS-402	8 - 20		1.4
BSS-462	10 - 22		1.6
BSS-502	6 - 20		1.9
BSS-542	6 - 24		1.5
Third Layer			
BSS-043A	25 - 34		2.1
BSS-103A	16 - 34		2.5
BSS-343	28 - 48		1.5
BSS-403	20 - 48	LT	1.25
BSS-463	22 - 50		1.8
BSS-503	20 - 34		1.8
BSS-543	24 - 40		1.3
Fourth Layer			
BSS-044A	34 - 65		2.6
BSS-104A	34 - 60		0.7
BSS-113A	38 - 60		4.3
BSS-114A	60 - 80		5.7
BSS-344	48 - 60		2
BSS-404	48 - 72		3
BSS-464	50 - 63		2.5
BSS-504	34 - 60		1.9
BSS-544	40 - 68		68.6
Fifth Layer			
BSS-045A	89 - 103		3.4
BSS-105A	90 - 120		4.7
BSS-115A	96 - 120		5.2
BSS-345	108 - 132		3.2
BSS-405	96 - 120		7.8
BSS-465	96 - 120		3.5
BSS-505	96 - 120		1.8
BSS-545	96 - 120		1.9

Orangeburg Soil Series

Fluoride

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6	LT	1.25
BSS-101	0 - 6	LT	1.25
BSS-111	0 - 6		1.3
BSS-341	0 - 6		1.3
BSS-401	0 - 8	LT	1.25
BSS-461	0 - 10	LT	1.25
BSS-501	0 - 6	LT	1.25
BSS-541	0 - 6	LT	1.25
Second Layer			
BSS-042A	6 - 25	LT	1.25
BSS-102A	6 - 16	LT	1.25
BSS-112A	6 - 38	LT	1.25
BSS-342	6 - 28	LT	1.25
BSS-402	8 - 20	LT	1.25
BSS-462	10 - 22	LT	1.25
BSS-502	6 - 20	LT	1.25
BSS-542	6 - 24	LT	1.25
Third Layer			
BSS-043A	25 - 34	LT	1.25
BSS-103A	16 - 34	LT	1.25
BSS-343	28 - 48	LT	1.25
BSS-403	20 - 48	LT	1.25
BSS-463	22 - 50	LT	1.25
BSS-503	20 - 34	LT	1.25
BSS-543	24 - 40	LT	1.25
Fourth Layer			
BSS-044A	34 - 65	LT	1.25
BSS-104A	34 - 60	LT	0.25
BSS-113A	38 - 60	LT	1.25
BSS-114A	60 - 80	LT	1.25
BSS-344	48 - 60	LT	1.25
BSS-404	48 - 72	LT	1.25
BSS-464	50 - 63	LT	1.25
BSS-504	34 - 60	LT	1.25
BSS-544	40 - 68	LT	1.25
Fifth Layer			
BSS-045A	89 - 103	LT	1.25
BSS-105A	90 - 120	LT	1.25
BSS-115A	96 - 120	LT	1.25
BSS-345	108 - 132	LT	1.25
BSS-405	96 - 120	LT	1.25
BSS-465	96 - 120	LT	1.25
BSS-505	96 - 120	LT	1.25
BSS-545	96 - 120	LT	1.25

Orangeburg Soil Series

Nitrate

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-041	0	- 6		2.1
BSS-101	0	- 6		1.1
BSS-111	0	- 6		1.3
BSS-341	0	- 6		1.4
BSS-401	0	- 8		0.67
BSS-461	0	- 10		4.6
BSS-501	0	- 6		22.5
BSS-541	0	- 6	LT	0.5
Second Layer				
BSS-042A	6	- 25		1.7
BSS-102A	6	- 16		1.5
BSS-112A	6	- 38		0.99
BSS-342	6	- 28		4.2
BSS-402	8	- 20		1.7
BSS-462	10	- 22		1.5
BSS-502	6	- 20		3.6
BSS-542	6	- 24		2.2
Third Layer				
BSS-043A	25	- 34		0.94
BSS-103A	16	- 34		1.4
BSS-343	28	- 48		1.3
BSS-403	20	- 48	LT	0.5
BSS-463	22	- 50	LT	0.5
BSS-503	20	- 34		2.3
BSS-543	24	- 40		1.4
Fourth Layer				
BSS-044A	34	- 65		1.2
BSS-104A	34	- 60	LT	0.1
BSS-113A	38	- 60		0.79
BSS-114A	60	- 80		7
BSS-344	48	- 60		1.8
BSS-404	48	- 72	LT	0.5
BSS-464	50	- 63	LT	0.5
BSS-504	34	- 60		2.5
BSS-544	40	- 68	LT	0.5
Fifth Layer				
BSS-045A	89	- 103		0.87
BSS-105A	90	- 120		0.67
BSS-115A	96	- 120		0.75
BSS-345	108	- 132		1.1
BSS-405	96	- 120	LT	0.5
BSS-465	96	- 120		0.97
BSS-505	96	- 120	LT	0.5
BSS-545	96	- 120		0.88

Orangeburg Soil Series

Nitrite

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6	LT	1.25
BSS-101	0 - 6	LT	1.25
BSS-111	0 - 6	LT	1.25
BSS-341	0 - 6	LT	1.25
BSS-401	0 - 8	LT	1.25
BSS-461	0 - 10	LT	1.25
BSS-501	0 - 6	LT	1.25
BSS-541	0 - 6	LT	1.25
Second Layer			
BSS-042A	6 - 25	LT	1.25
BSS-102A	6 - 16	LT	1.25
BSS-112A	6 - 38	LT	1.25
BSS-342	6 - 28	LT	1.25
BSS-402	8 - 20	LT	1.25
BSS-462	10 - 22	LT	1.25
BSS-502	6 - 20	LT	1.25
BSS-542	6 - 24	LT	1.25
Third Layer			
BSS-043A	25 - 34	LT	1.25
BSS-103A	16 - 34	LT	1.25
BSS-343	28 - 48	LT	1.25
BSS-403	20 - 48	LT	1.25
BSS-463	22 - 50	LT	1.25
BSS-503	20 - 34	LT	1.25
BSS-543	24 - 40	LT	1.25
Fourth Layer			
BSS-044A	34 - 65	LT	1.25
BSS-104A	34 - 60	LT	0.25
BSS-113A	38 - 60	LT	1.25
BSS-114A	60 - 80	LT	1.25
BSS-344	48 - 60	LT	1.25
BSS-404	48 - 72	LT	1.25
BSS-464	50 - 63	LT	1.25
BSS-504	34 - 60	LT	1.25
BSS-544	40 - 68	LT	1.25
Fifth Layer			
BSS-045A	89 - 103	LT	1.25
BSS-105A	90 - 120	LT	1.25
BSS-115A	96 - 120	LT	1.25
BSS-345	108 - 132	LT	1.25
BSS-405	96 - 120	LT	1.25
BSS-465	96 - 120	LT	1.25
BSS-505	96 - 120	LT	1.25
BSS-545	96 - 120	LT	1.25

Orangeburg Soil Series

Phosphate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6	LT	5
BSS-101	0 - 6	LT	5
BSS-111	0 - 6	LT	5
BSS-341	0 - 6	LT	5
BSS-401	0 - 8		8
BSS-461	0 - 10	LT	5
BSS-501	0 - 6		8.3
BSS-541	0 - 6	LT	5
Second Layer			
BSS-042A	6 - 25	LT	5
BSS-102A	6 - 16	LT	5
BSS-112A	6 - 38	LT	5
BSS-342	6 - 28	LT	5
BSS-402	8 - 20	LT	5
BSS-462	10 - 22	LT	5
BSS-502	6 - 20		9.8
BSS-542	6 - 24	LT	5
Third Layer			
BSS-043A	25 - 34	LT	5
BSS-103A	16 - 34	LT	5
BSS-343	28 - 48	LT	5
BSS-403	20 - 48	LT	5
BSS-463	22 - 50	LT	5
BSS-503	20 - 34	LT	5
BSS-543	24 - 40	LT	5
Fourth Layer			
BSS-044A	34 - 65	LT	5
BSS-104A	34 - 60	LT	0.25
BSS-113A	38 - 60	LT	5
BSS-114A	60 - 80	LT	1
BSS-344	48 - 60	LT	5
BSS-404	48 - 72	LT	5
BSS-464	50 - 63	LT	5
BSS-504	34 - 60	LT	5
BSS-544	40 - 68	LT	5
Fifth Layer			
BSS-045A	89 - 103	LT	5
BSS-105A	90 - 120	LT	5
BSS-115A	96 - 120	LT	5
BSS-345	108 - 132	LT	5
BSS-405	96 - 120	LT	5
BSS-465	96 - 120	LT	5
BSS-505	96 - 120	LT	5
BSS-545	96 - 120	LT	5

Orangeburg Soil Series

Sulfate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		5.8
BSS-101	0 - 6		11.4
BSS-111	0 - 6		11.5
BSS-341	0 - 6		12.6
BSS-401	0 - 8		7.9
BSS-461	0 - 10		14.3
BSS-501	0 - 6		9.8
BSS-541	0 - 6		5.9
Second Layer			
BSS-042A	6 - 25		14.6
BSS-102A	6 - 16		15.2
BSS-112A	6 - 38		20.7
BSS-342	6 - 28		17.4
BSS-402	8 - 20		20.6
BSS-462	10 - 22		16.5
BSS-502	6 - 20		20.2
BSS-542	6 - 24		14.1
Third Layer			
BSS-043A	25 - 34		14.2
BSS-103A	16 - 34		12.8
BSS-343	28 - 48		18.5
BSS-403	20 - 48		15.3
BSS-463	22 - 50		16.1
BSS-503	20 - 34		14.5
BSS-543	24 - 40		18.1
Fourth Layer			
BSS-044A	34 - 65	LT	5
BSS-104A	34 - 60		1
BSS-113A	38 - 60	LT	5
BSS-114A	60 - 80		2.8
BSS-344	48 - 60		21.4
BSS-404	48 - 72		6.8
BSS-464	50 - 63		17
BSS-504	34 - 60		12.6
BSS-544	40 - 68	LT	5
Fifth Layer			
BSS-045A	89 - 103	LT	5
BSS-105A	90 - 120		4.9
BSS-115A	96 - 120	LT	5
BSS-345	108 - 132	LT	5
BSS-405	96 - 120		6.8
BSS-465	96 - 120	LT	5
BSS-505	96 - 120	LT	5
BSS-545	96 - 120	LT	5

Udorthent Soil Series

Cyanide

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	0.25
BSS-132	12 - 24	LT	0.25
BSS-201A	0 - 24	LT	0.25
BSS-301	0 - 24	LT	0.25
BSS-311	0 - 24	LT	0.25
BSS-361	0 - 24	LT	0.25
BSS-531	0 - 24	LT	0.25
BSS-551	0 - 24	LT	0.25
BSS-581	0 - 24	LT	0.25
Second Layer			
BSS-133	24 - 36	LT	0.25
BSS-202A	24 - 48	LT	0.25
BSS-302	24 - 48	LT	0.25
BSS-312	24 - 48	LT	0.25
BSS-362	24 - 48	LT	0.25
BSS-532	24 - 48	LT	0.25
BSS-552	24 - 48	LT	0.25
BSS-582	24 - 48	LT	0.25
Third Layer			
BSS-203A	48 - 72	LT	0.25
BSS-303	48 - 72	LT	0.25
BSS-313	48 - 72	LT	0.25
BSS-363	48 - 72	LT	0.25
BSS-533	48 - 72	LT	0.25
BSS-553	48 - 72	LT	0.25
BSS-583	48 - 72	LT	0.25

Udorthent Soil Series

Chloride

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	1.25
BSS-132	12 - 24	LT	1.25
BSS-201A	0 - 24		3.5
BSS-301	0 - 24		4
BSS-311	0 - 24		7
BSS-361	0 - 24		2.7
BSS-531	0 - 24		7
BSS-551	0 - 24		5.4
BSS-581	0 - 24		2.4
Second Layer			
BSS-133	24 - 36	LT	1.25
BSS-202A	24 - 48		5.4
BSS-302	24 - 48		2.9
BSS-312	24 - 48		10.2
BSS-362	24 - 48		1.9
BSS-532	24 - 48		10.5
BSS-552	24 - 48		19.7
BSS-582	24 - 48		4.4
Third Layer			
BSS-203A	48 - 72		4.1
BSS-303	48 - 72		3.5
BSS-313	48 - 72		5.7
BSS-363	48 - 72		2.1
BSS-533	48 - 72		5.4
BSS-553	48 - 72		4
BSS-583	48 - 72		3.3

Udorthent Soil Series

Fluoride

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	1.25
BSS-132	12 - 24	LT	1.25
BSS-201A	0 - 24	LT	1.25
BSS-301	0 - 24	LT	1.25
BSS-311	0 - 24	LT	1.25
BSS-361	0 - 24	LT	1.25
BSS-531	0 - 24	LT	1.25
BSS-551	0 - 24	LT	1.25
BSS-581	0 - 24		1.3
Second Layer			
BSS-133	24 - 36	LT	1.25
BSS-202A	24 - 48	LT	1.25
BSS-302	24 - 48	LT	1.25
BSS-312	24 - 48	LT	1.25
BSS-362	24 - 48	LT	1.25
BSS-532	24 - 48	LT	1.25
BSS-552	24 - 48	LT	1.25
BSS-582	24 - 48	LT	1.25
Third Layer			
BSS-203A	48 - 72	LT	1.25
BSS-303	48 - 72	LT	1.25
BSS-313	48 - 72	LT	1.25
BSS-363	48 - 72	LT	1.25
BSS-533	48 - 72	LT	1.25
BSS-553	48 - 72	LT	1.25
BSS-583	48 - 72	LT	1.25

Udorthent Soil Series

Nitrate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		7.1
BSS-132	12 - 24	LT	0.5
BSS-201A	0 - 24	LT	0.5
BSS-301	0 - 24	LT	0.5
BSS-311	0 - 24	LT	0.5
BSS-361	0 - 24		2.4
BSS-531	0 - 24		2.4
BSS-551	0 - 24		2.8
BSS-581	0 - 24	LT	0.5
Second Layer			
BSS-133	24 - 36	LT	0.5
BSS-202A	24 - 48	LT	0.5
BSS-302	24 - 48		8.9
BSS-312	24 - 48	LT	0.5
BSS-362	24 - 48	LT	0.5
BSS-532	24 - 48		2.2
BSS-552	24 - 48		8.4
BSS-582	24 - 48		1.5
Third Layer			
BSS-203A	48 - 72		0.93
BSS-303	48 - 72	LT	0.5
BSS-313	48 - 72	LT	0.5
BSS-363	48 - 72		1.2
BSS-533	48 - 72		2
BSS-553	48 - 72		3.2
BSS-583	48 - 72		1.1

Udorthent Soil Series

Nitrite

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	1.25
BSS-132	12 - 24	LT	1.25
BSS-201A	0 - 24	LT	1.25
BSS-301	0 - 24	LT	1.25
BSS-311	0 - 24	LT	1.25
BSS-361	0 - 24	LT	1.25
BSS-531	0 - 24	LT	1.25
BSS-551	0 - 24	LT	1.25
BSS-581	0 - 24	LT	1.25
Second Layer			
BSS-133	24 - 36	LT	1.25
BSS-202A	24 - 48	LT	1.25
BSS-302	24 - 48	LT	1.25
BSS-312	24 - 48	LT	1.25
BSS-362	24 - 48	LT	1.25
BSS-532	24 - 48	LT	1.25
BSS-552	24 - 48	LT	1.25
BSS-582	24 - 48	LT	1.25
Third Layer			
BSS-203A	48 - 72	LT	1.25
BSS-303	48 - 72	LT	1.25
BSS-313	48 - 72	LT	1.25
BSS-363	48 - 72	LT	1.25
BSS-533	48 - 72	LT	1.25
BSS-553	48 - 72	LT	1.25
BSS-583	48 - 72	LT	1.25

Udorthent Soil Series

Phosphate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	5
BSS-132	12 - 24	LT	5
BSS-201A	0 - 24	LT	5
BSS-301	0 - 24	LT	5
BSS-311	0 - 24	LT	5
BSS-361	0 - 24	LT	5
BSS-531	0 - 24	LT	5
BSS-551	0 - 24	LT	5
BSS-581	0 - 24	LT	5
Second Layer			
BSS-133	24 - 36	LT	5
BSS-202A	24 - 48	LT	5
BSS-302	24 - 48	LT	5
BSS-312	24 - 48	LT	5
BSS-362	24 - 48	LT	5
BSS-532	24 - 48	LT	5
BSS-552	24 - 48	LT	5
BSS-582	24 - 48	LT	5
Third Layer			
BSS-203A	48 - 72	LT	1
BSS-303	48 - 72	LT	5
BSS-313	48 - 72	LT	5
BSS-363	48 - 72	LT	5
BSS-533	48 - 72	LT	5
BSS-553	48 - 72	LT	5
BSS-583	48 - 72	LT	5

Udorthent Soil Series

Sulfate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	5
BSS-132	12 - 24	LT	5
BSS-201A	0 - 24		9.7
BSS-301	0 - 24		6.2
BSS-311	0 - 24		8
BSS-361	0 - 24	LT	5
BSS-531	0 - 24		5
BSS-551	0 - 24	LT	5
BSS-581	0 - 24		21.2
Second Layer			
BSS-133	24 - 36	LT	5
BSS-202A	24 - 48	LT	5
BSS-302	24 - 48	LT	5
BSS-312	24 - 48	LT	5
BSS-362	24 - 48	LT	5
BSS-532	24 - 48		5.3
BSS-552	24 - 48		5.3
BSS-582	24 - 48		7.5
Third Layer			
BSS-203A	48 - 72		2.6
BSS-303	48 - 72		11.7
BSS-313	48 - 72	LT	5
BSS-363	48 - 72	LT	5
BSS-533	48 - 72	LT	5
BSS-553	48 - 72	LT	5
BSS-583	48 - 72	LT	5

Vaucluse Soil Series

Cyanide

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23	LT	0.25
BSS-241	0 - 22	LT	0.25
BSS-471	0 - 12	LT	0.25
BSS-591	0 - 23	LT	0.25
Second Layer			
BSS-122	23 - 65	LT	0.25
BSS-242	22 - 59	LT	0.25
BSS-472	12 - 38	LT	0.25
BSS-592	23 - 50	LT	0.25
Third Layer			
BSS-123	65 - 82	LT	0.25
BSS-243	59 - 74	LT	0.25
BSS-473	38 - 72	LT	0.25
BSS-593	50 - 72	LT	0.25
Fourth Layer			
BSS-124	95 - 119	LT	0.25
BSS-244	96 - 120	LT	0.25
BSS-474	96 - 120	LT	0.25
BSS-594	96 - 120	LT	0.25

Vaucluse Soil Series

Chloride

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		1.8
BSS-241	0 - 22	LT	1.25
BSS-471	0 - 12		5.1
BSS-591	0 - 23		3.5
Second Layer			
BSS-122	23 - 65	LT	1.25
BSS-242	22 - 59		3.7
BSS-472	12 - 38		7.1
BSS-592	23 - 50		1.6
Third Layer			
BSS-123	65 - 82		1.4
BSS-243	59 - 74		4.1
BSS-473	38 - 72		70.7
BSS-593	50 - 72		1.8
Fourth Layer			
BSS-124	95 - 119		1.6
BSS-244	96 - 120		3.6
BSS-474	96 - 120		7.1
BSS-594	96 - 120		2

Vaucluse Soil Series

Fluoride

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23	LT	1.25
BSS-241	0 - 22	LT	1.25
BSS-471	0 - 12		1.5
BSS-591	0 - 23	LT	1.25
Second Layer			
BSS-122	23 - 65	LT	1.25
BSS-242	22 - 59	LT	1.25
BSS-472	12 - 38		2.7
BSS-592	23 - 50	LT	1.25
Third Layer			
BSS-123	65 - 82	LT	1.25
BSS-243	59 - 74	LT	1.25
BSS-473	38 - 72		2.2
BSS-593	50 - 72	LT	1.25
Fourth Layer			
BSS-124	95 - 119	LT	1.25
BSS-244	96 - 120	LT	1.25
BSS-474	96 - 120		1.3
BSS-594	96 - 120	LT	1.25

Vaucluse Soil Series

Nitrate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		3
BSS-241	0 - 22	LT	0.5
BSS-471	0 - 12		2.4
BSS-591	0 - 23	LT	0.5
Second Layer			
BSS-122	23 - 65	LT	0.5
BSS-242	22 - 59	LT	0.5
BSS-472	12 - 38		1.8
BSS-592	23 - 50		2.1
Third Layer			
BSS-123	65 - 82		0.59
BSS-243	59 - 74	LT	0.5
BSS-473	38 - 72		1.1
BSS-593	50 - 72		4.7
Fourth Layer			
BSS-124	95 - 119	LT	0.5
BSS-244	96 - 120	LT	0.5
BSS-474	96 - 120		1.2
BSS-594	96 - 120	LT	0.5

Vaucluse Soil Series

Nitrite

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23	LT	1.25
BSS-241	0 - 22	LT	1.25
BSS-471	0 - 12	LT	1.25
BSS-591	0 - 23	LT	1.25
Second Layer			
BSS-122	23 - 65	LT	1.25
BSS-242	22 - 59	LT	1.25
BSS-472	12 - 38	LT	1.25
BSS-592	23 - 50	LT	1.25
Third Layer			
BSS-123	65 - 82	LT	1.25
BSS-243	59 - 74	LT	1.25
BSS-473	38 - 72	LT	1.25
BSS-593	50 - 72	LT	1.25
Fourth Layer			
BSS-124	95 - 119	LT	1.25
BSS-244	96 - 120	LT	1.25
BSS-474	96 - 120	LT	1.25
BSS-594	96 - 120	LT	1.25

Vaucluse Soil Series

Phosphate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23	LT	5
BSS-241	0 - 22	LT	5
BSS-471	0 - 12		7.5
BSS-591	0 - 23	LT	5
Second Layer			
BSS-122	23 - 65	LT	5
BSS-242	22 - 59	LT	5
BSS-472	12 - 38	LT	5
BSS-592	23 - 50	LT	5
Third Layer			
BSS-123	65 - 82	LT	5
BSS-243	59 - 74	LT	5
BSS-473	38 - 72	LT	5
BSS-593	50 - 72	LT	5
Fourth Layer			
BSS-124	95 - 119	LT	5
BSS-244	96 - 120	LT	5
BSS-474	96 - 120	LT	5
BSS-594	96 - 120	LT	5

Vaucluse Soil Series

Sulfate

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		19.7
BSS-241	0 - 22		9.5
BSS-471	0 - 12		25.1
BSS-591	0 - 23		16.3
Second Layer			
BSS-122	23 - 65	LT	5
BSS-242	22 - 59	LT	5
BSS-472	12 - 38	LT	5
BSS-592	23 - 50		5.3
Third Layer			
BSS-123	65 - 82	LT	5
BSS-243	59 - 74	LT	5
BSS-473	38 - 72		21.4
BSS-593	50 - 72	LT	5
Fourth Layer			
BSS-124	95 - 119	LT	5
BSS-244	96 - 120	LT	5
BSS-474	96 - 120	LT	5
BSS-594	96 - 120	LT	5

**GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND
SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE**

Appendix C.3

Organic Data Summary

Blanton Soil Series

Total Organic Carbon

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		5870
BSS-061	0 - 6		3800
BSS-091	0 - 5		3080
BSS-231	0 - 7		3435
BSS-331	0 - 8		4669
BSS-351	0 - 7		8842
BSS-431	0 - 6		3556
BSS-451	0 - 5		4785
Second Layer			
BSS-012	10 - 65		452
BSS-062	6 - 50		1630
BSS-092A	5 - 52		1360
BSS-232	7 - 61		300
BSS-332	8 - 72		4838
BSS-352	7 - 60		857
BSS-432	6 - 67		2130
BSS-452	5 - 59		563
Third Layer			
BSS-013	65 - 87		446
BSS-063	50 - 74		410
BSS-093A	52 - 72		300
BSS-233	61 - 70		290
BSS-333	72 - 84		783
BSS-353	60 - 72		1429
BSS-433	67 - 77		841
BSS-453	59 - 72		852
Fourth Layer			
BSS-014	111 - 124		284
BSS-064	96 - 120		322
BSS-094A	96 - 120		380
BSS-234	96 - 120		270
BSS-334	96 - 120		506
BSS-354	96 - 120		573
BSS-434	96 - 120		860
BSS-454	96 - 120		334

Blanton Soil Series

Total Organic Halogens

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	10
BSS-061	0 - 6	LT	10
BSS-091	0 - 5		10
BSS-231	0 - 7	LT	10
BSS-331	0 - 8	LT	10
BSS-351	0 - 7	LT	10
BSS-431	0 - 6	LT	10
BSS-451	0 - 5	LT	10
Second Layer			
BSS-012	10 - 65	LT	10
BSS-062	6 - 50	LT	10
BSS-092A	5 - 52	LT	10
BSS-232	7 - 61	LT	10
BSS-332	8 - 72	LT	10
BSS-352	7 - 60	LT	10
BSS-432	6 - 67	LT	10
BSS-452	5 - 59	LT	10
Third Layer			
BSS-013	65 - 87	LT	10
BSS-063	50 - 74	LT	10
BSS-093A	52 - 72	LT	10
BSS-233	61 - 70	LT	10
BSS-333	72 - 84	LT	10
BSS-353	60 - 72	LT	10
BSS-433	67 - 77	LT	10
BSS-453	59 - 72	LT	10
Fourth Layer			
BSS-014	111 - 124	LT	10
BSS-064	96 - 120	LT	10
BSS-094A	96 - 120	LT	10
BSS-234	96 - 120	LT	10
BSS-334	96 - 120	LT	10
BSS-354	96 - 120	LT	10
BSS-434	96 - 120	LT	10
BSS-454	96 - 120	LT	10

Fuquay Soil Series

Total Organic Carbon

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		3260
BSS-071	0 - 8		4230
BSS-081	0 - 6		3910
BSS-211	0 - 5		4618
BSS-321	0 - 6		5336
BSS-421	0 - 9		11090
BSS-441	0 - 7		13146
BSS-491	0 - 9		2957
Second Layer			
BSS-032	10 - 39		597
BSS-072A	8 - 36		540
BSS-082	6 - 36		1270
BSS-212A	5 - 47		557
BSS-322	6 - 49		301
BSS-422	9 - 45		936
BSS-442	7 - 38		1172
BSS-492	9 - 41		471
Third Layer			
BSS-033	39 - 72		646
BSS-073A	36 - 72		400
BSS-083	36 - 72		420
BSS-213A	47 - 77		394
BSS-323	49 - 72		1134
BSS-423	45 - 72		545
BSS-443	38 - 70		1330
BSS-493	41 - 72		764
Fourth Layer			
BSS-034	96 - 120		290
BSS-074A	96 - 120		195
BSS-084	96 - 120		920
BSS-214A	96 - 120		121
BSS-324	96 - 120		335
BSS-424	96 - 120		219
BSS-444	96 - 120		532
BSS-494	96 - 120		415

Fuquay Soil Series

Total Organic Halogens

Unit: microgram/gram

First Layer	Interval (inches)		Modifier	Result
BSS-031	0	- 6	LT	10
BSS-071	0	- 8	LT	10
BSS-081	0	- 6	LT	10
BSS-211	0	- 5	LT	10
BSS-321	0	- 6	LT	10
BSS-421	0	- 9	LT	10
BSS-441	0	- 7	LT	10
BSS-491	0	- 9	LT	10
Second Layer				
BSS-032	10	- 39	LT	10
BSS-072A	8	- 36	LT	10
BSS-082	6	- 36	LT	10
BSS-212A	5	- 47	LT	10
BSS-322	6	- 49	LT	10
BSS-422	9	- 45	LT	10
BSS-442	7	- 38	LT	10
BSS-492	9	- 41	LT	10
Third Layer				
BSS-033	39	- 72	LT	10
BSS-073A	36	- 72	LT	10
BSS-083	36	- 72	LT	10
BSS-213A	47	- 77	LT	10
BSS-323	49	- 72	LT	10
BSS-423	45	- 72	LT	10
BSS-443	38	- 70	LT	10
BSS-493	41	- 72	LT	10
Fourth Layer				
BSS-034	96	- 120	LT	10
BSS-074A	96	- 120	LT	10
BSS-084	96	- 120	LT	10
BSS-214A	96	- 120	LT	10
BSS-324	96	- 120	LT	10
BSS-424	96	- 120	LT	10
BSS-444	96	- 120	LT	10
BSS-494	96	- 120	LT	10

Lakeland Soil Series

Total Organic Carbon

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-021	0 - 8		7770
BSS-221	0 - 7		2573
BSS-411	0 - 5		6760
BSS-481	0 - 4		4092
BSS-511	0 - 5		908
BSS-521	0 - 5		8443
BSS-561	0 - 5		14493
BSS-571	0 - 9		12426
Second Layer			
BSS-022	9 - 84		477
BSS-222A	7 - 80		220
BSS-412	5 - 80		604
BSS-482	4 - 80		409
BSS-512	5 - 80		4555
BSS-522	5 - 80		436
BSS-562	5 - 80		300
BSS-572	9 - 80		446
Third Layer			
BSS-023	110 - 124		202
BSS-223A	96 - 120		546
BSS-413	96 - 120		748
BSS-483	96 - 120		208
BSS-513	96 - 120		720
BSS-523	96 - 120		632
BSS-563	96 - 120		712
BSS-573	96 - 120		1646

Lakeland Soil Series

Total Organic Halogens

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-021	0 - 8	LT	10
BSS-221	0 - 7	LT	10
BSS-411	0 - 5	LT	10
BSS-481	0 - 4	LT	10
BSS-511	0 - 5	LT	10
BSS-521	0 - 5		17.4
BSS-561	0 - 5	LT	10
BSS-571	0 - 9	LT	10
Second Layer			
BSS-022	9 - 84	LT	10
BSS-222A	7 - 80	LT	10
BSS-412	5 - 80	LT	10
BSS-482	4 - 80	LT	10
BSS-512	5 - 80	LT	10
BSS-522	5 - 80	LT	10
BSS-562	5 - 80	LT	10
BSS-572	9 - 80	LT	10
Third Layer			
BSS-023	110 - 124	LT	10
BSS-223A	96 - 120	LT	10
BSS-413	96 - 120	LT	10
BSS-483	96 - 120	LT	10
BSS-513	96 - 120	LT	10
BSS-523	96 - 120	LT	10
BSS-563	96 - 120	LT	10
BSS-573	96 - 120	LT	10

Orangeburg Soil Series

Total Organic Carbon

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		2830
BSS-101	0 - 6		3219
BSS-111	0 - 6		5480
BSS-341	0 - 6		3661
BSS-401	0 - 8		2499
BSS-461	0 - 10		2725
BSS-501	0 - 6		3693
BSS-541	0 - 6		3430
Second Layer			
BSS-042A	6 - 25		1230
BSS-102A	6 - 16		1313
BSS-112A	6 - 38		1840
BSS-342	6 - 28		1870
BSS-402	8 - 20		2084
BSS-462	10 - 22		976
BSS-502	6 - 20		2678
BSS-542	6 - 24		619
Third Layer			
BSS-043A	25 - 34		967
BSS-103A	16 - 34		1150
BSS-343	28 - 48		889
BSS-403	20 - 48		1106
BSS-463	22 - 50		625
BSS-503	20 - 34		865
BSS-543	24 - 40		2615
Fourth Layer			
BSS-044A	34 - 65		796
BSS-104A	34 - 60		432
BSS-113A	38 - 60		900
BSS-114A	60 - 80		440
BSS-344	48 - 60		399
BSS-404	48 - 72		643
BSS-464	50 - 63		1034
BSS-504	34 - 60		1107
BSS-544	40 - 68		1272
Fifth Layer			
BSS-045A	89 - 103		257
BSS-105A	90 - 120		487
BSS-115A	96 - 120		520
BSS-345	108 - 132		1176
BSS-405	96 - 120		514
BSS-465	96 - 120		440
BSS-505	96 - 120		471
BSS-545	96 - 120		305

Orangeburg Soil Series

Total Organic Halogens

Unit: microgram/gram

First Layer	Interval (inches)			Modifier	Result
BSS-041	0	-	6	LT	10
BSS-101	0	-	6	LT	10
BSS-111	0	-	6	LT	10
BSS-341	0	-	6	LT	10
BSS-401	0	-	8	LT	10
BSS-461	0	-	10	LT	10
BSS-501	0	-	6	LT	10
BSS-541	0	-	6	LT	10
Second Layer					
BSS-042A	6	-	25	LT	10
BSS-102A	6	-	16	LT	10
BSS-112A	6	-	38	LT	10
BSS-342	6	-	28	LT	10
BSS-402	8	-	20	LT	10
BSS-462	10	-	22	LT	10
BSS-502	6	-	20	LT	10
BSS-542	6	-	24	LT	10
Third Layer					
BSS-043A	25	-	34	LT	10
BSS-103A	16	-	34	LT	10
BSS-343	28	-	48	LT	10
BSS-403	20	-	48	LT	10
BSS-463	22	-	50	LT	10
BSS-503	20	-	34	LT	10
BSS-543	24	-	40	LT	10
Fourth Layer					
BSS-044A	34	-	65	LT	10
BSS-104A	34	-	60	LT	10
BSS-113A	38	-	60	LT	10
BSS-114A	60	-	80	LT	10
BSS-344	48	-	60	LT	10
BSS-404	48	-	72	LT	10
BSS-464	50	-	63	LT	10
BSS-504	34	-	60	LT	10
BSS-544	40	-	68	LT	10
Fifth Layer					
BSS-045A	89	-	103	LT	10
BSS-105A	90	-	120	LT	10
BSS-115A	96	-	120	LT	10
BSS-345	108	-	132	LT	10
BSS-405	96	-	120	LT	10
BSS-465	96	-	120	LT	10
BSS-505	96	-	120	LT	10
BSS-545	96	-	120	LT	10

Udorthent Soil Series

Total Organic Carbon

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		316
BSS-132	12 - 24		192
BSS-201A	0 - 24		5260
BSS-301	0 - 24		32
BSS-311	0 - 24		640
BSS-361	0 - 24		1197
BSS-531	0 - 24		386
BSS-551	0 - 24		96
BSS-581	0 - 24		557
Second Layer			
BSS-133	24 - 36		183
BSS-202A	24 - 48		490
BSS-302	24 - 48		539
BSS-312	24 - 48		495
BSS-362	24 - 48		692
BSS-532	24 - 48		654
BSS-552	24 - 48		97
BSS-582	24 - 48		440
Third Layer			
BSS-203A	48 - 72		145
BSS-303	48 - 72		365
BSS-313	48 - 72		236
BSS-363	48 - 72		275
BSS-533	48 - 72		237
BSS-553	48 - 72		43
BSS-583	48 - 72		165

Udorthent Soil Series

Total Organic Halogens

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	10
BSS-132	12 - 24	LT	10
BSS-201A	0 - 24	LT	10
BSS-301	0 - 24	LT	10
BSS-311	0 - 24	LT	10
BSS-361	0 - 24	LT	10
BSS-531	0 - 24	LT	10
BSS-551	0 - 24	LT	10
BSS-581	0 - 24	LT	10
Second Layer			
BSS-133	24 - 36	LT	10
BSS-202A	24 - 48	LT	10
BSS-302	24 - 48	LT	10
BSS-312	24 - 48	LT	10
BSS-362	24 - 48	LT	10
BSS-532	24 - 48	LT	10
BSS-552	24 - 48	LT	10
BSS-582	24 - 48	LT	10
Third Layer			
BSS-203A	48 - 72	LT	10
BSS-303	48 - 72	LT	10
BSS-313	48 - 72	LT	10
BSS-363	48 - 72	LT	10
BSS-533	48 - 72	LT	10
BSS-553	48 - 72	LT	10
BSS-583	48 - 72	LT	10

Vaucluse Soil Series

Total Organic Carbon

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		5440
BSS-241	0 - 22		2420
BSS-471	0 - 12		5703
BSS-591	0 - 23		971
Second Layer			
BSS-122	23 - 65		263
BSS-242	22 - 59		730
BSS-472	12 - 38		595
BSS-592	23 - 50		6236
Third Layer			
BSS-123	65 - 82		487
BSS-243	59 - 74		90
BSS-473	38 - 72		243
BSS-593	50 - 72		280
Fourth Layer			
BSS-124	95 - 119		233
BSS-244	96 - 120		79
BSS-474	96 - 120		189
BSS-594	96 - 120		192

Vaucluse Soil Series

Total Organic Halogens

Unit: microgram/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23	LT	10
BSS-241	0 - 22	LT	10
BSS-471	0 - 12	LT	10
BSS-591	0 - 23	LT	10
Second Layer			
BSS-122	23 - 65	LT	10
BSS-242	22 - 59	LT	10
BSS-472	12 - 38	LT	10
BSS-592	23 - 50	LT	10
Third Layer			
BSS-123	65 - 82	LT	10
BSS-243	59 - 74	LT	10
BSS-473	38 - 72	LT	10
BSS-593	50 - 72	LT	10
Fourth Layer			
BSS-124	95 - 119	LT	10
BSS-244	96 - 120	LT	10
BSS-474	96 - 120	LT	10
BSS-594	96 - 120	LT	10

**GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND
SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE**

Appendix C.4

Radiological Data Summary

Blanton Soil Series

Gross Alpha

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		9.4
BSS-061	0 - 6	LT	4
BSS-091	0 - 5	LT	6
BSS-231	0 - 7	LT	4
BSS-331	0 - 8		2.9
BSS-351	0 - 7	LT	4
BSS-431	0 - 6	LT	4
BSS-451	0 - 5	LT	4
Second Layer			
BSS-012	10 - 65		9.9
BSS-062	6 - 50	LT	4
BSS-092A	5 - 52	LT	6
BSS-232	7 - 61	LT	4
BSS-332	8 - 72		3.8
BSS-352	7 - 60		5.2
BSS-432	6 - 67	LT	4
BSS-452	5 - 59	LT	4
Third Layer			
BSS-013	65 - 87		8.5
BSS-063	50 - 74		5.2
BSS-093A	52 - 72	LT	6
BSS-233	61 - 70		6.1
BSS-333	72 - 84		6.1
BSS-353	60 - 72		6.1
BSS-433	67 - 77		6.1
BSS-453	59 - 72		8.5
Fourth Layer			
BSS-014	111 - 124		10
BSS-064	96 - 120		7.4
BSS-094A	96 - 120	LT	6
BSS-234	96 - 120	LT	4
BSS-334	96 - 120	LT	4
BSS-354	96 - 120		6.1
BSS-434	96 - 120		5.6
BSS-454	96 - 120		4.1

Blanton Soil Series

Gross Beta

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7		5.9
BSS-061	0 - 6	LT	6
BSS-091	0 - 5	LT	8
BSS-231	0 - 7	LT	6
BSS-331	0 - 8	LT	5
BSS-351	0 - 7	LT	6
BSS-431	0 - 6	LT	7
BSS-451	0 - 5		10
Second Layer			
BSS-012	10 - 65		12
BSS-062	6 - 50		6.7
BSS-092A	5 - 52	LT	8
BSS-232	7 - 61	LT	6
BSS-332	8 - 72		8
BSS-352	7 - 60		12
BSS-432	6 - 67	LT	7
BSS-452	5 - 59	LT	6
Third Layer			
BSS-013	65 - 87		8.8
BSS-063	50 - 74		6.2
BSS-093A	52 - 72	LT	7
BSS-233	61 - 70	LT	7
BSS-333	72 - 84		7.3
BSS-353	60 - 72		8.2
BSS-433	67 - 77		12
BSS-453	59 - 72		14
Fourth Layer			
BSS-014	111 - 124		9.3
BSS-064	96 - 120		6.5
BSS-094A	96 - 120	LT	7
BSS-234	96 - 120	LT	7
BSS-334	96 - 120		10
BSS-354	96 - 120		7
BSS-434	96 - 120		16
BSS-454	96 - 120		11

Blanton Soil Series

Uranium

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	1
BSS-061	0 - 6	LT	1
BSS-091	0 - 5	LT	1
BSS-231	0 - 7	LT	1
BSS-331	0 - 8		1
BSS-351	0 - 7		1.3
BSS-431	0 - 6	LT	1
BSS-451	0 - 5		1.3
Second Layer			
BSS-012	10 - 65	LT	1
BSS-062	6 - 50	LT	1
BSS-092A	5 - 52	LT	1
BSS-232	7 - 61	LT	1
BSS-332	8 - 72	LT	1
BSS-352	7 - 60		1
BSS-432	6 - 67	LT	1
BSS-452	5 - 59	LT	1
Third Layer			
BSS-013	65 - 87		1.4
BSS-063	50 - 74	LT	1
BSS-093A	52 - 72	LT	1
BSS-233	61 - 70	LT	1
BSS-333	72 - 84		1.3
BSS-353	60 - 72	LT	1
BSS-433	67 - 77	LT	1
BSS-453	59 - 72		1.4
Fourth Layer			
BSS-014	111 - 124		2.2
BSS-064	96 - 120	LT	1
BSS-094A	96 - 120	LT	1
BSS-234	96 - 120	LT	1
BSS-334	96 - 120		1.3
BSS-354	96 - 120		1.1
BSS-434	96 - 120		1.9
BSS-454	96 - 120		1

Blanton Soil Series

Strontium-90

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-011	0 - 7	LT	1
BSS-061	0 - 6	LT	1
BSS-091	0 - 5	LT	1
BSS-231	0 - 7	LT	1
BSS-331	0 - 8	LT	1
BSS-351	0 - 7	LT	1
BSS-431	0 - 6	LT	1
BSS-451	0 - 5	LT	1
Second Layer			
BSS-012	10 - 65	LT	1
BSS-062	6 - 50	LT	1
BSS-092A	5 - 52	LT	1
BSS-232	7 - 61	LT	1
BSS-332	8 - 72	LT	1
BSS-352	7 - 60	LT	1
BSS-432	6 - 67	LT	1
BSS-452	5 - 59	LT	1
Third Layer			
BSS-013	65 - 87	LT	1
BSS-063	50 - 74	LT	1
BSS-093A	52 - 72	LT	1
BSS-233	61 - 70	LT	1
BSS-333	72 - 84	LT	1
BSS-353	60 - 72	LT	1
BSS-433	67 - 77	LT	1
BSS-453	59 - 72	LT	1
Fourth Layer			
BSS-014	111 - 124	LT	1
BSS-064	96 - 120	LT	1
BSS-094A	96 - 120	LT	1
BSS-234	96 - 120	LT	1
BSS-334	96 - 120	LT	1
BSS-354	96 - 120	LT	1
BSS-434	96 - 120	LT	1
BSS-454	96 - 120	LT	1

Fuquay Soil Series

Gross Alpha

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6		5.4
BSS-071	0 - 8	LT	4
BSS-081	0 - 6	LT	6
BSS-211	0 - 5	LT	4
BSS-321	0 - 6		6.9
BSS-421	0 - 9		4.9
BSS-441	0 - 7	LT	4
BSS-491	0 - 9	LT	5
Second Layer			
BSS-032	10 - 39		4.7
BSS-072A	8 - 36		5.18
BSS-082	6 - 36	LT	6
BSS-212A	5 - 47		10
BSS-322	6 - 49	LT	4
BSS-422	9 - 45		6.1
BSS-442	7 - 38		6.7
BSS-492	9 - 41	LT	4
Third Layer			
BSS-033	39 - 72		7.2
BSS-073A	36 - 72		9
BSS-083	36 - 72	LT	6
BSS-213A	47 - 77		6.9
BSS-323	49 - 72		8.3
BSS-423	45 - 72	LT	4
BSS-443	38 - 70		8.1
BSS-493	41 - 72		5.3
Fourth Layer			
BSS-034	96 - 120		20
BSS-074A	96 - 120		6.7
BSS-084	96 - 120		5.2
BSS-214A	96 - 120		7.4
BSS-324	96 - 120		7.3
BSS-424	96 - 120		3.9
BSS-444	96 - 120		14
BSS-494	96 - 120	LT	5

Fuquay Soil Series

Gross Beta

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	6
BSS-071	0 - 8		7.6
BSS-081	0 - 6	LT	8
BSS-211	0 - 5		8.1
BSS-321	0 - 6		8.6
BSS-421	0 - 9	LT	6
BSS-441	0 - 7		9.9
BSS-491	0 - 9	LT	6
Second Layer			
BSS-032	10 - 39	LT	7
BSS-072	8 - 36	LT	6
BSS-08	6 - 36	LT	7
BSS-212A	5 - 47		8.3
BSS-322	6 - 49	LT	6
BSS-422	9 - 45		13
BSS-442	7 - 38		9.6
BSS-492	9 - 41	LT	6
Third Layer			
BSS-033	39 - 72	LT	7
BSS-073A	36 - 72		15
BSS-083	36 - 72		9.1
BSS-213A	47 - 77		12
BSS-323	40 - 72		13
BSS-423	45 - 72		12
BSS-443	38 - 70		15
BSS-493	41 - 72		9.6
Fourth Layer			
BSS-034	96 - 120		16
BSS-074A	96 - 120		11
BSS-084	96 - 120		13
BSS-214A	96 - 120	LT	7
BSS-324	96 - 120	LT	6
BSS-424	96 - 120		10
BSS-444	96 - 120		13
BSS-494	96 - 120		12

Fuquay Soil Series

Uranium

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	1
BSS-071	0 - 8		3.3
BSS-081	0 - 6	LT	1
BSS-211	0 - 5	LT	1
BSS-321	0 - 6	LT	1
BSS-421	0 - 9	LT	1
BSS-441	0 - 7	LT	1
BSS-491	0 - 9	LT	1
Second Layer			
BSS-032	10 - 39	LT	1
BSS-072A	8 - 36	LT	1
BSS-082	6 - 36	LT	1
BSS-212A	5 - 47	LT	1
BSS-322	6 - 49	LT	1
BSS-422	9 - 45		1.8
BSS-442	7 - 33	LT	1
BSS-492	9 - 41	LT	1
Third Layer			
BSS-033	39 - 72		1.2
BSS-073A	36 - 72		1.4
BSS-083	36 - 72		1.2
BSS-213A	47 - 77		1.4
BSS-323	49 - 72	LT	1
BSS-423	45 - 72		1.6
BSS-443	38 - 70		1.4
BSS-493	41 - 72		1.1
Fourth Layer			
BSS-034	96 - 120	LT	1
BSS-074A	96 - 120		1.2
BSS-084	96 - 120		2.4
BSS-214A	96 - 120	LT	1
BSS-324	96 - 120	LT	1
BSS-424	96 - 120	LT	1
BSS-444	96 - 120		2
BSS-494	96 - 120	LT	1

Fuquay Soil Series

Strontium-90

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-031	0 - 6	LT	1
BSS-071	0 - 8	LT	1
BSS-081	0 - 6	LT	1
BSS-211	0 - 5	LT	1
BSS-321	0 - 6	LT	1
BSS-421	0 - 9	LT	1
BSS-441	0 - 7	LT	1
BSS-491	0 - 9	LT	1
Second Layer			
BSS-032	10 - 39	LT	1
BSS-072A	8 - 36	LT	1
BSS-082	6 - 36	LT	1
BSS-212A	5 - 47	LT	1
BSS-322	6 - 49	LT	1
BSS-422	9 - 45	LT	1
BSS-442	7 - 38	LT	1
BSS-492	9 - 41	LT	1
Third Layer			
BSS-033	39 - 72	LT	1
BSS-073A	36 - 72	LT	1
BSS-083	36 - 72	LT	1
BSS-213A	47 - 77	LT	1
BSS-323	49 - 72	LT	1
BSS-423	45 - 72	LT	1
BSS-443	38 - 70	LT	1
BSS-493	41 - 72	LT	1
Fourth Layer			
BSS-034	96 - 120	LT	1
BSS-074A	96 - 120	LT	1
BSS-084	96 - 120	LT	1
BSS-214A	96 - 120	LT	1
BSS-324	96 - 120	LT	1
BSS-424	96 - 120	LT	1
BSS-444	96 - 120	LT	1
BSS-494	96 - 120	LT	1

Lakeland Soil Series

Gross Alpha

Unit: picocurie/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8		4.9
BSS-221	0	-	7	LT	4
BSS-411	0	-	5	LT	5
BSS-481	0	-	4	LT	4
BSS-511	0	-	5		3.8
BSS-521	0	-	5		6.8
BSS-561	0	-	5	LT	5
BSS-571	0	-	9	LT	4
Second Layer					
BSS-022	9	-	84		4.2
BSS-222A	7	-	80	LT	4
BSS-412	5	-	80	LT	4
BSS-482	4	-	80	LT	5
BSS-512	5	-	80	LT	4
BSS-522	5	-	80	LT	5
BSS-562	5	-	80	LT	5
BSS-572	9	-	80	LT	4
Third Layer					
BSS-023	110	-	124		5.5
BSS-223A	96	-	120		6.1
BSS-413	96	-	120	LT	5
BSS-483	96	-	120	LT	5
BSS-513	96	-	120	LT	4
BSS-523	96	-	120	LT	6
BSS-563	96	-	120	LT	5
BSS-573	96	-	120	LT	4

Lakeland Soil Series

Gross Beta

Unit: picocurie/gram

First Layer	Interval (inches)			Modifier	Result
BSS-021	0	-	8	LT	6
BSS-221	0	-	7	LT	7
BSS-411	0	-	5	LT	6
BSS-481	0	-	4	LT	6
BSS-511	0	-	5	LT	6
BSS-521	0	-	5		8.4
BSS-561	0	-	5	LT	7
BSS-571	0	-	9		12
Second Layer					
BSS-022	9	-	84	LT	6
BSS-222A	7	-	80	LT	6
BSS-412	5	-	80	LT	6
BSS-482	4	-	80	LT	6
BSS-512	5	-	80		9.7
BSS-522	5	-	80	LT	7
BSS-562	5	-	80	LT	7
BSS-572	9	-	80		8.3
Third Layer					
BSS-023	110	-	124	LT	7
BSS-223A	96	-	120	LT	6
BSS-413	96	-	120		6.3
BSS-483	96	-	120	LT	6
BSS-513	96	-	120		13
BSS-523	96	-	120	LT	7
BSS-563	96	-	120	LT	7
BSS-573	96	-	120		10

Lakeland Soil Series

Uranium

Unit: picocurie/gram

First Layer	Interval (inches)		Modifier	Result
BSS-021	0	- 8	LT	1
BSS-221	0	- 7		1.3
BSS-411	0	- 5	LT	1
BSS-481	0	- 4	LT	1
BSS-511	0	- 5	LT	1
BSS-521	0	- 5	LT	1
BSS-561	0	- 5	LT	1
BSS-571	0	- 9	LT	1
Second Layer				
BSS-022	9	- 84	LT	1
BSS-222A	7	- 80	LT	1
BSS-412	5	- 80	LT	1
BSS-482	4	- 80	LT	1
BSS-512	5	- 80	LT	1
BSS-522	5	- 80	LT	1
BSS-562	5	- 80	LT	1
BSS-572	9	- 80	LT	1
Third Layer				
BSS-023	110	- 124		1.1
BSS-223A	96	- 120	LT	1
BSS-413	96	- 120	LT	1
BSS-483	96	- 120	LT	1
BSS-513	96	- 120		1.3
BSS-523	96	- 120	LT	1
BSS-563	96	- 120	LT	1
BSS-573	96	- 120	LT	1

Lakeland Soil Series

Strontium-90

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-021	0 - 8	LT	1
BSS-221	0 - 7	LT	1
BSS-411	0 - 5	LT	1
BSS-481	0 - 4	LT	1
BSS-511	0 - 5	LT	1
BSS-521	0 - 5	LT	1
BSS-561	0 - 5	LT	1
BSS-571	0 - 9	LT	1
Second Layer			
BSS-022	9 - 84	LT	1
BSS-222A	7 - 80	LT	1
BSS-412	5 - 80	LT	1
BSS-482	4 - 80	LT	1
BSS-512	5 - 80	LT	1
BSS-522	5 - 80	LT	1
BSS-562	5 - 80	LT	1
BSS-572	9 - 80	LT	1
Third Layer			
BSS-023	110 - 124	LT	1
BSS-223A	96 - 120	LT	1
BSS-413	96 - 120	LT	1
BSS-483	96 - 120	LT	1
BSS-513	96 - 120	LT	1
BSS-523	96 - 120	LT	1
BSS-563	96 - 120	LT	1
BSS-573	96 - 120	LT	1

Orangeburg Soil Series

Gross Alpha

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6		10
BSS-101	0 - 6	LT	4
BSS-111	0 - 6		6.4
BSS-341	0 - 6		4.5
BSS-401	0 - 8	LT	4
BSS-461	0 - 10	LT	5
BSS-501	0 - 6	LT	4
BSS-541	0 - 6	LT	4
Second Layer			
BSS-042A	6 - 25		5.4
BSS-102A	6 - 16		6.8
BSS-112A	6 - 38		7.2
BSS-342	6 - 28	LT	4
BSS-402	8 - 20	LT	5
BSS-462	10 - 22	LT	6
BSS-502	6 - 20		7.2
BSS-542	6 - 24		6.9
Third Layer			
BSS-043A	25 - 34		7.6
BSS-103A	16 - 34		7.3
BSS-343	28 - 48		8.7
BSS-403	20 - 48		4.7
BSS-463	22 - 50	LT	6
BSS-503	20 - 34		6.2
BSS-543	24 - 40		8
Fourth Layer			
BSS-044A	34 - 65		8.6
BSS-104A	34 - 60		9.3
BSS-113A	38 - 60		6.4
BSS-114A	60 - 80		6.5
BSS-344	48 - 60	LT	4
BSS-404	48 - 72		5.4
BSS-464	50 - 63	LT	5
BSS-504	34 - 60		5.6
BSS-544	40 - 68		11
Fifth Layer			
BSS-045A	89 - 103		8.1
BSS-105A	90 - 120		5.4
BSS-115A	96 - 120		7.6
BSS-345	108 - 132		7.5
BSS-405	96 - 120		5
BSS-465	96 - 120	LT	5
BSS-505	96 - 120		4.9
BSS-545	96 - 120		6.1

Orangeburg Soil Series

Gross Beta

Unit: picocurie/gram

First Layer	Interval (inches)		Modifier	Result
BSS-041	0	- 6		7.2
BSS-101	0	- 6		7.7
BSS-111	0	- 6		9
BSS-341	0	- 6		7.2
BSS-401	0	- 8	LT	6
BSS-461	0	- 10	LT	6
BSS-501	0	- 6	LT	6
BSS-541	0	- 6	LT	6
Second Layer				
BSS-042A	6	- 25		7.7
BSS-102A	6	- 16		13
BSS-112A	6	- 38		13
BSS-342	6	- 28		6.8
BSS-402	8	- 20		8.4
BSS-462	10	- 22		8.5
BSS-502	6	- 20		9.3
BSS-542	6	- 24	LT	6
Third Layer				
BSS-043A	25	- 34	LT	6
BSS-103A	16	- 34		12
BSS-343	28	- 48		11
BSS-403	20	- 48	LT	6
BSS-463	22	- 50		7.8
BSS-503	20	- 34		14
BSS-543	24	- 40		7.5
Fourth Layer				
BSS-044A	34	- 65	LT	6
BSS-104A	34	- 60		11
BSS-113A	38	- 60		10
BSS-114A	60	- 80		9.6
BSS-344	48	- 60		8.9
BSS-404	48	- 72		8.1
BSS-464	50	- 63		6.4
BSS-504	34	- 60		14
BSS-544	40	- 68		13
Fifth Layer				
BSS-045A	89	- 103		11
BSS-105A	90	- 120		13
BSS-115A	96	- 120		9.2
BSS-345	108	- 132	LT	7
BSS-405	96	- 120		9
BSS-465	96	- 120		12
BSS-505	96	- 120		15
BSS-545	96	- 120		12

Orangeburg Soil Series

Uranium

Unit: picocurie/gram

First Layer	Interval (inches)		Modifier	Result
BSS-041	0	- 6	LT	1
BSS-101	0	- 6		1.8
BSS-111	0	- 6	LT	1
BSS-341	0	- 6		1.4
BSS-401	0	- 8		1.2
BSS-461	0	- 10	LT	1
BSS-501	0	- 6	LT	1
BSS-541	0	- 6	LT	1
Second Layer				
BSS-042A	6	- 25		1.8
BSS-102A	6	- 16		1.9
BSS-112A	6	- 38		1.2
BSS-342	6	- 28		1.6
BSS-402	8	- 20		1.4
BSS-462	10	- 22		1.3
BSS-502	6	- 20		1.4
BSS-542	6	- 24		1.3
Third Layer				
BSS-043A	25	- 34		1.3
BSS-103A	16	- 34		1.8
BSS-343	28	- 48		2.6
BSS-403	20	- 48		1.1
BSS-463	22	- 50	LT	1
BSS-503	20	- 34	LT	1
BSS-543	24	- 40		1.2
Fourth Layer				
BSS-044A	34	- 65		3.3
BSS-104A	34	- 60		1.2
BSS-113A	38	- 60		1.7
BSS-114A	60	- 80	LT	1
BSS-344	48	- 60		1.8
BSS-404	48	- 72	L	1
BSS-464	50	- 63		1.2
BSS-504	34	- 60		1.8
BSS-544	40	- 68		1.1
Fifth Layer				
BSS-045A	89	- 103		1.3
BSS-105A	90	- 120		1
BSS-115A	96	- 120		1
BSS-345	108	- 132		1.2
BSS-405	96	- 120		1
BSS-465	96	- 120		2
BSS-505	96	- 120		1.6
BSS-545	96	- 120	LT	1

Orangeburg Soil Series

Strontium-90

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-041	0 - 6	LT	1
BSS-101	0 - 6	LT	1
BSS-111	0 - 6	LT	1
BSS-341	0 - 6	LT	1
BSS-401	0 - 8	LT	1
BSS-461	0 - 10	LT	1
BSS-501	0 - 6	LT	1
BSS-541	0 - 6	LT	1
Second Layer			
BSS-042A	6 - 25	LT	1
BSS-102A	6 - 16	LT	1
BSS-112A	6 - 38	LT	1
BSS-342	6 - 28	LT	1
BSS-402	8 - 20	LT	1
BSS-462	10 - 22	LT	1
BSS-502	6 - 20	LT	1
BSS-542	6 - 24	LT	1
Third Layer			
BSS-043A	25 - 34	LT	1
BSS-103A	16 - 34	LT	1
BSS-343	28 - 48	LT	1
BSS-403	20 - 48	LT	1
BSS-463	22 - 50	LT	1
BSS-503	20 - 34	LT	1
BSS-543	24 - 40	LT	1
Fourth Layer			
BSS-044A	34 - 65	LT	1
BSS-104A	34 - 60	LT	1
BSS-113A	38 - 60	LT	1
BSS-114A	60 - 80	LT	1
BSS-344	48 - 60	LT	1
BSS-404	48 - 72	LT	1
BSS-464	50 - 63	LT	1
BSS-504	34 - 60	LT	1
BSS-544	40 - 68	LT	1
Fifth Layer			
BSS-045A	89 - 103	LT	1
BSS-105A	90 - 120	LT	1
BSS-115A	96 - 120	LT	1
BSS-345	108 - 132	LT	1
BSS-405	96 - 120	LT	1
BSS-465	96 - 120	LT	1
BSS-505	96 - 120	LT	1
BSS-545	96 - 120	LT	1

Udorthent Soil Series

Gross Alpha

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		11
BSS-132	12 - 24	LT	4
BSS-201A	0 - 24		11
BSS-301	0 - 24		9.8
BSS-311	0 - 24		8.4
BSS-361	0 - 24		9.7
BSS-531	0 - 24		6.2
BSS-551	0 - 24		6.3
BSS-581	0 - 24		7.7
Second Layer			
BSS-133	24 - 36		9.6
BSS-202A	24 - 48		4.7
BSS-302	24 - 48		3.9
BSS-312	24 - 48		9
BSS-362	24 - 48		5.3
BSS-532	24 - 48		11
BSS-552	24 - 48	LT	4
BSS-582	24 - 48	LT	4
Third Layer			
BSS-203A	48 - 72		6.7
BSS-303	48 - 72		9.4
BSS-313	48 - 72		6.8
BSS-363	48 - 72		8.1
BSS-533	48 - 72		8.4
BSS-553	48 - 72		4.7
BSS-583	48 - 72		4.1

Udorthent Soil Series

Gross Beta

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		23
BSS-132	12 - 24		10
BSS-201A	0 - 24		12
BSS-301	0 - 24		8.4
BSS-311	0 - 24		6.9
BSS-361	0 - 24		12
BSS-531	0 - 24		10
BSS-551	0 - 24		12
BSS-581	0 - 24		14
Second Layer			
BSS-133	24 - 36		8.8
BSS-202A	24 - 48		9.6
BSS-302	24 - 48		10.5
BSS-312	24 - 48		10
BSS-362	24 - 48		7.8
BSS-532	24 - 48		10
BSS-552	24 - 48	LT	7
BSS-582	24 - 48		8.5
Third Layer			
BSS-203A	48 - 72		6.4
BSS-303	48 - 72		12
BSS-313	48 - 72		8.4
BSS-363	48 - 72		7.3
BSS-533	48 - 72		10
BSS-553	48 - 72	LT	7
BSS-583	48 - 72		9.7

Udorthent Soil Series

Uranium

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12		4.4
BSS-132	12 - 24		3
BSS-201A	0 - 24		1.3
BSS-301	0 - 24		1.4
BSS-311	0 - 24		1.6
BSS-361	0 - 24		1.9
BSS-531	0 - 24		1.7
BSS-551	0 - 24	LT	1
BSS-581	0 - 24	LT	1
Second Layer			
BSS-133	24 - 36		4.7
BSS-202A	24 - 48		1.6
BSS-302	24 - 48		1.9
BSS-312	24 - 48		1.1
BSS-362	24 - 48		1.3
BSS-532	24 - 48		1.7
BSS-552	24 - 48		1.3
BSS-582	24 - 48	LT	1
Third Layer			
BSS-203A	48 - 72		1.4
BSS-303	48 - 72		1.7
BSS-313	48 - 72	LT	1
BSS-363	48 - 72		1.2
BSS-533	48 - 72		1.9
BSS-553	48 - 72	LT	1
BSS-583	48 - 72	LT	1

Udorthent Soil Series

Strontium-90

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-131	0 - 12	LT	1
BSS-132	12 - 24	LT	1
BSS-201A	0 - 24	LT	1
BSS-301	0 - 24	LT	1
BSS-311	0 - 24	LT	1
BSS-361	0 - 24	LT	1
BSS-531	0 - 24	LT	1
BSS-551	0 - 24	LT	1
BSS-581	0 - 24	LT	1
Second Layer			
BSS-133	24 - 36	LT	1
BSS-202A	24 - 48	LT	1
BSS-302	24 - 48	LT	1
BSS-312	24 - 48	LT	1
BSS-362	24 - 48	LT	1
BSS-532	24 - 48	LT	1
BSS-552	24 - 48	LT	1
BSS-582	24 - 48	LT	1
Third Layer			
BSS-203A	48 - 72	LT	1
BSS-303	48 - 72	LT	1
BSS-313	48 - 72	LT	1
BSS-363	48 - 72	LT	1
BSS-533	48 - 72	LT	1
BSS-553	48 - 72	LT	1
BSS-583	48 - 72	LT	1

Vaucluse Soil Series

Gross Alpha

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		7.8
BSS-241	0 - 22		4.4
BSS-471	0 - 12		7.4
BSS-591	0 - 23		7.5
Second Layer			
BSS-122	23 - 65		7.8
BSS-242	22 - 59		4.1
BSS-472	12 - 38	LT	5
BSS-592	23 - 50		6.8
Third Layer			
BSS-123	65 - 82		4.3
BSS-243	59 - 74	LT	4
BSS-473	38 - 72	LT	5
BSS-593	50 - 72		5
Fourth Layer			
BSS-124	95 - 119		5.9
BSS-244	96 - 120	LT	4
BSS-474	96 - 120	LT	5
BSS-594	96 - 120	LT	4

Vaucluse Soil Series

Gross Beta

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		14
BSS-241	0 - 22	LT	6
BSS-471	0 - 12		11
BSS-591	0 - 23		12
Second Layer			
BSS-122	23 - 65		11
BSS-242	22 - 59		6.4
BSS-472	12 - 38	LT	7
BSS-592	23 - 50		10
Third Layer			
BSS-123	65 - 82		8.8
BSS-243	59 - 74	LT	7
BSS-473	38 - 72	LT	7
BSS-593	50 - 72		7.4
Fourth Layer			
BSS-124	95 - 119		9.2
BSS-244	96 - 120	LT	7
BSS-474	96 - 120	LT	7
BSS-594	96 - 120		9

Vaucluse Soil Series

Uranium

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23		1.3
BSS-241	0 - 22	LT	1
BSS-471	0 - 12		1.6
BSS-591	0 - 23		2.4
Second Layer			
BSS-122	23 - 65		1.1
BSS-242	22 - 59	LT	1
BSS-472	12 - 38		2.2
BSS-592	23 - 50		1.1
Third Layer			
BSS-123	65 - 82		1.5
BSS-243	59 - 74	LT	1
BSS-473	38 - 72	LT	1
BSS-593	50 - 72		1.1
Fourth Layer			
BSS-124	95 - 119		1.3
BSS-244	96 - 120	LT	1
BSS-474	96 - 120	LT	1
BSS-594	96 - 120		1.6

Vaucluse Soil Series

Strontium-90

Unit: picocurie/gram

First Layer	Interval (inches)	Modifier	Result
BSS-121	0 - 23	LT	1
BSS-241	0 - 22	LT	1
BSS-471	0 - 12	LT	1
BSS-591	0 - 23	LT	1
Second Layer			
BSS-122	23 - 65	LT	1
BSS-242	22 - 59	LT	1
BSS-472	12 - 38	LT	1
BSS-592	23 - 50	LT	1
Third Layer			
BSS-123	65 - 82	LT	1
BSS-243	59 - 74	LT	1
BSS-473	38 - 72	LT	1
BSS-593	50 - 72	LT	1
Fourth Layer			
BSS-124	95 - 119	LT	1
BSS-244	96 - 120	LT	1
BSS-474	96 - 120	LT	1
BSS-594	96 - 120	LT	1

**GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND
SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE**

Appendix C.5

Particle Size Data Summary

GRADATION CURVES

COBBLES		GRAVEL		SAND			SILT OR CLAY	
COARSE	FINE	COARSE	FINE	COARSE	MEDIUM	FINE		

SAMPLE NO. AA17562	EL. or DEPTH	CLASSIFICATION	NAT. WT. %	LL	PL	PI	PROJECT
		SC	14.7				METATRACE
							BORING NO. BSS 202 B
							DATE 4-29-89
							24"-48"

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT.WT.%	LL	PL	PI	PROJECT	METATRACE
AA17565		SM	6.6				BORING NO. BSS 212 A	5"-47"
							DATE	4-29-89
			GEOTECHNOLOGY ROBERT EMMETT SMITH LABORATORY, 210 MCCLINTOCK SAINT LOUIS, MISSOURI

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT.WT.%	LL	PL	PI	PROJECT
AA17574		SP-SM	2.8				META TRACE
							BORING NO. BSS 222 B 7"-10"
							DATE 4-3-89
							G TM GEOTECHNOLOGY ENGINEERING AND ENVIRONMENTAL SCIENCES SANTA CLARA UNIVERSITY

COBBLES	GRAVEL			SAND			SILT OR CLAY
	COARSE	FINE	FINE	COARSE	MEDIUM	FINE	

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT.WT.%	LL	PL	PI	PROJECT	METAIRACE
AA17658		SC	11.4				BORING NO. BSS 244 16"	120"
							DATE 4-3-89
							THE GEOTECHNOLOGY ENGINEERING AND ENVIRONMENTAL SERVICES SAINT LOUIS, MISSOURI	

GRADATION CURVES

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT. WT. %	LL	PL	PI	PROJECT
AA17654	SM		6.6				METATRACE
		BORING NO. BSS 234	DATE 4-29-89				
		16" - 120"					
<p>GEOTECHNOLOGY ENGINEERING AND ENVIRONMENTAL SERVICES SUNBELT LOGISTICS</p>							

GRADATION CURVES

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT.WT. %	LL	PL	PI	PROJECT
AA17661	SM		12.3				METATRACE
BORING NO. 655 303 48" - 72"			DATE 4-29-89				
GEOTECHNOLOGY <small>Soils and Foundations Division</small>							

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

GRAIN SIZE IN MILLIMETERS

[illegible]

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT.WT.%	LL	PL	PI	PROJECT
AA17749		CL	20.3				METATRACE
							BORING NO. BSS 313
							DATE 4-3-89
							GEOTECHNOLOGY ENGINEERING AND CONSULTANTS, S.F. & C.S. SAINT LOUIS, MISSOURI

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT. WT. %	LL	PL	PI	PROJECT	METATRACE
AA1-751		SP	6.9				BORING NO. BSS 322	6"-49"
							DATE 10-13-88	
BSS-322	6" - 49"						GEOTECH-INOLOGY <small>ENGINEERING AND ENVIRONMENTAL SERVICES SAINT LOUIS, MISSOURI</small>	

GRADATION CURVES

COBBLES	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE		

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT. WT. %	LL	PL	PI	PROJECT
AA18269		SP	3.4				METATRACE
BSS-331	0" - 8"						

BORING NO. BSS 331

DATE 10-19-88

0" - 8"

10-19-88

GEOTECHNOLOGY

ROCKWELL AND ASSOCIATES, INC.

SAINT LOUIS, MISSOURI

GRADATION CURVES

GRADATION CURVES

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT. WT. %	SAND			GRAVEL		SILT OR CLAY			PROJECT
				COARSE	MEDIUM	FINE	COARSE	FINE	PI	PL	LL	
AA18278	SC		16.4									METATRACE
0" - 24"												
BORING NO. BSS 361 0"-24"												
DATE 10-19-88												
3SS-361												
<p>GEO TECHNOLOGY ENGINEERING AND INVESTIGATIONAL SERVICES SAINT LOUIS, MISSOURI</p>												

GRADATION CURVES

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT. WT. %	LL	PL	PI	PROJECT	METATRACE
	AA18128							
BSS-403	20" - 48"							

BORING NO. **BSS 403**

DATE **10-18-88**

20" - 48"

GEOTECHNOLOGY
LABORATORY SERVICES

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT.WT.%	LL	PL	PI	PROJECT	METATRACE
AA18124		SP	3.7				BORING NO. BSS 412	6"-80"
							DATE 10-19-88	
							 GEOTECHNOLOGY ENGINEERING AND ENVIRONMENTAL SERVICES SUITE 100, WILSON BLVD.	
SS-112	5" - 80"							

GRADATION CURVES

SAMPLE NO. AA18403	EL. or DEPTH	CLASSIFICATION	NAT. WT. % 12.3	LL	PL	PI	PROJECT METATRACE	BORING NO. BSS 422
								DATE 10-19-88
								9" - 45"

11100

GRAIN SIZE IN MILLIMETERS					SILT OR CLAY
COBBLES	GRAVEL		SAND		
	COARSE	FINE	COARSE	FINE	

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT. WT. %	LL	PL	PI	PROJECT	METATRACE
AA18960		SP	5.5				BORING NO. BSS 132	6" - 67"
							DATE 10-19-88	
BSS-432	6" - 67"						GEOTECHNOLOGY ENGINEERING AND ENVIRONMENTAL SERVICES SAINT LOUIS, MISSOURI	

GRADATION CURVES

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT.WT.%	LL	PL	PI	PROJECT	METATRACE
AA18411		SP	5.0					
							BORING NO.	BSS 452 5"-59"
							DATE	10-19-88
BSS-452	5" - 59"						GEOTECHNOLOGY ENGINEERING AND ENVIRONMENTAL SERVICES SAINT LOUIS, MISSOURI	

GRADATION CURVES

SAMPLE NO. AA18238	EL. or DEPTH	CLASSIFICATION				NAT. WT. %				PI	PROJECT	METATRACE
		SP										
BSS-463	22" - 50"											
BORING NO. BSS 463 22'-50" DATE 10-19-88 GEOTECHNOLOGY ENGINEERING AND ENVIRONMENTAL SERVICES SAINT LOUIS, MISSOURI												

HYDROMETER

U.S. STANDARD SIEVE NUMBERS

U.S. STANDARD SIEVE OPENING IN INCHES

11100

COBBLES	GRAVEL		SAND		SILT OR CLAY
	COARSE	FINE	COARSE	FINE	

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT. WT. %	LL	PL	PI	PROJECT	METATRACE
AA18560		SP	11.9				BORING NO. BSS 473	38" - 72"
							DATE 10-13-88	
BSS-473	38" - 72"						GEOTECH-INOLOGY ENGINEERING AND ENVIRONMENTAL SERVICES SAINT LOUIS, MISSOURI

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT.WT.%	LL	PL	PI	PROJECT
AA18655		SP	4.7				METATRACE
							BORING NO. BSS 482
							DATE 10-19-88
BSS-482	4" - 80"						GEOTECHNOLOGY ENGINEERING AND ENVIRONMENTAL SERVICES SAINT LOUIS, MISSOURI

GRADATION CURVES

COBBLES		GRAVEL		SAND			SILT OR CLAY	
COARSE	FINE	COARSE	FINE	COARSE	MEDIUM	FINE		

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT. WT. %	LL	PL	PI	PROJECT
AA18658		SP	6.5				METATRACE
BSS-492	9" - 41"						
		BORING NO. BSS 492 9"-41"					
		DATE 10-19-88					
		GEOTECHNOLOGY					
		ENGINEERING AND ENVIRONMENTAL SERVICES					
		SAINT LOUIS, MISSOURI					

GRADATION CURVES

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT. WT. %	LL	PL	PI	PROJECT	METADATA
AA18400		SP	5.7					
BSS-512	5" - 80"							

BORING NO. **BSS 512 5"-80"**

DATE **10-19-88**

GEOTECHNOLOGY
ENGINEERING AND ENVIRONMENTAL SERVICES
SAINT LOUIS, MISSOURI

GRADATION CURVES

COBBLES	GRAVEL		SAND			SILT OR CLAY	
	COARSE	FINE	COARSE	MEDIUM	FINE		

SAMPLE NO.	AA18452	EL. or DEPTH	6" - 24"	CLASSIFICATION	SP	NAT. WT. %	7.6	LL		PL		PI		PROJECT	METATRACE
BSS-542														BORING NO.	BSS 542 6"-24"
														DATE	10-19-88
<p>GEOTECHNOLOGY ENGINEERING AND ENVIRONMENTAL SERVICES EAST LANSING, MICHIGAN</p>															

GRADATION CURVES

U.S. STANDARD SIEVE OPENING IN INCHES

U.S. STANDARD SIEVE NUMBERS

HYDROMETER

SAMPLE NO.	EL. or DEPTH	CLASSIFICATION	NAT.WT.%	LL	PL	PI	PROJECT	METATRACE
1A18956		SC	12.7					
							BORING NO. BSS 551	0"-24"
							DATE	10-19-88
BSS-551	0" - 24"						GEOTECHNOLOGY ENGINEERING AND ENVIRONMENTAL SERVICES SAINT LOUIS MISSOURI	

**GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND
SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE**

Appendix C.6

Carbon Steel/Stainless Steel Data Summary

Carbon/Stainless Steel Sampler Comparison Data

Al	Units: (ppm)				
Sample ID	Carbon	Stainless	Difference	RPD	
BSS-042	29930	28000	1930	6.7	
BSS-043	26300	28680	-2380	-8.7	
BSS-044	30660	42400	-11740	-32.1	
BSS-045	53530	31840	21690	50.8	
BSS-072	16550	8166	8384	67.8	
BSS-073	17270	22710	-5440	-27.2	
BSS-074	26510	36690	-10180	-32.2	
BSS-092	4520	4800	-280	-6.0	
BSS-093	18400	14140	4260	26.2	
BSS-094	7140	6680	460	6.7	
BSS-102	12460	11120	1340	11.4	
BSS-103	31000	23630	7370	27.0	
BSS-104	28400	43580	-15180	-42.2	
BSS-105	9520	7402	2118	25.0	
BSS-112	50100	50450	-350	-0.7	
BSS-113	13450	43240	-29790	-105.1	
BSS-114	51730	49190	2540	5.0	
BSS-115	26850	29750	-2900	-10.2	
BSS-201	21260	7570	13690	95.0	
BSS-202	19080	5708	13372	107.9	
BSS-203	4809	6172	-1363	-24.8	
BSS-212	5189	3209	1980	47.2	
BSS-213	19510	19480	30	0.2	
BSS-214	12130	14380	-2250	-17.0	
BSS-222	2010	6253	-4243	-102.7	
BSS-223	1669	5094	-3425	-101.3	

RPD denotes the Relative Percent Difference

$$RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$$

Carbon/Stainless Steel Sampler Comparison Data

As	Units:	(ppm)				
Sample ID	Carbon	Stainless	Difference	RPD		
BSS-042	3.42	3.35	0.07	2.1		
BSS-043	4.1	3.84	0.26	6.5		
BSS-044	5.78	2.58	3.2	76.6		
BSS-045	7.01	2.85	4.16	84.4		
BSS-072	1.46	0.79	0.67	59.6		
BSS-073	4.62	4.33	0.29	6.5		
BSS-074	15.2	4.12	11.08	114.7		
BSS-092	0.79	0.93	-0.14	-16.3		
BSS-093	5.29	7.46	-2.17	-34.0		
BSS-094	6.18	1.58	4.6	118.6		
BSS-102	2.19	2.46	-0.27	-11.6		
BSS-103	3	3.81	-0.81	-23.8		
BSS-104	2.96	6.85	-3.89	-79.3		
BSS-105	2.17	2.65	-0.48	-19.9		
BSS-112	4.87	4.94	-0.07	-1.4		
BSS-113	3.28	6.5	-3.22	-65.8		
BSS-114	6.84	7.54	-0.7	-9.7		
BSS-115	8.42	13.5	-5.08	-46.4		
BSS-201	4.45	3.2	1.25	32.7		
BSS-202	4.61	1.64	2.97	95.0		
BSS-203	4.41	2.62	1.79	50.9		
BSS-212	LT 1	LT 1				
BSS-213	6.23	4.2	2.03	38.9		
BSS-214	3.73	6.08	-2.35	-47.9		
BSS-222	0.85	1.05	-0.2	-21.1		
BSS-223	LT 0.6	2.27				

RPD denotes the Relative Percent Difference

$RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$

Carbon/Stainless Steel Sampler Comparison Data

Ba	Units:	(ppm)			
Sample ID	Carbon	Stainless	Difference	RPD	
BSS-042	61.3	11.5	49.8	136.8	
BSS-043	53.4	55.8	-2.4	-4.4	
BSS-044	36.9	22.54	14.36	48.3	
BSS-045	28.6	11.8	16.8	83.2	
BSS-072	42.6	28.2	14.4	40.7	
BSS-073	15.3	23.7	-8.4	-43.1	
BSS-074	12.2	14.7	-2.5	-18.6	
BSS-092	14	13.4	0.6	4.4	
BSS-093	7.6	8	-0.4	-5.1	
BSS-094	2.4	3.24	-0.84	-29.8	
BSS-102	18.4	18.43	-0.03	-0.2	
BSS-103	15.4	16.99	-1.59	-9.8	
BSS-104	10.5	15.49	-4.99	-38.4	
BSS-105	34.2	2.936	31.264	168.4	
BSS-112	48.84	42.35	6.49	14.2	
BSS-113	7.308	17.93	-10.622	-84.2	
BSS-114	22.74	20.86	1.88	8.6	
BSS-115	1.37	13.68	-12.31	-163.6	
BSS-201	10.99	3.873	7.117	95.8	
BSS-202	10.37	2.748	7.622	116.2	
BSS-203	2.936	2.936	0	0.0	
BSS-212	17.49	12.62	4.87	32.3	
BSS-213	14.36	18.05	-3.69	-22.8	
BSS-214	4.622	5.684	-1.062	-20.6	
BSS-222	5.011	6.683	-1.672	-28.6	
BSS-223	4.071	2.748	1.323	38.8	

RPD denotes the Relative Percent Difference

$RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$

Carbon/Stainless Steel Sampler Comparison Data

Cd	Units:	(ppm)				
Sample ID		Carbon	Stainless	Difference	RPD	
BSS-042	LT	0.5	44.5			
BSS-043	LT	1	0.1			
BSS-044	LT	0.5	0.1			
BSS-045	LT	0.5	0.1			
BSS-072	LT	0.5	0.5			
BSS-073	LT	0.5	0.5			
BSS-074	LT	0.5	0.5			
BSS-092	LT	1	1			
BSS-093	LT	0.6	1			
BSS-094	LT	1	1			
BSS-102	LT	1	0.5304			
BSS-103	LT	1	0.5304			
BSS-104	LT	1	0.5304			
BSS-105	LT	1	0.5304			
BSS-112		0.2652	LT 1			
BSS-113		0.7956	0.663	0.1326	18.2	
BSS-114		0.1326	0.5304	-0.3978	-120.0	
BSS-115		0.5304	1.061	-0.5306	-66.7	
BSS-201		0.5304	0.663	-0.1326	-22.2	
BSS-202		0.5304	0.7956	-0.2652	-40.0	
BSS-203		0.5967	0.4641	0.1326	25.0	
BSS-212		0.5967	0.7293	-0.1326	-20.0	
BSS-213	LT	1	0.4641			
BSS-214		0.5304	0.7956	-0.2652	-40.0	
BSS-222	LT	1	0.2652			
BSS-223	LT	1	0.8619			

RPD denotes the Relative Percent Difference
 $RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$

Carbon/Stainless Steel Sampler Comparison Data

Cr	Units: (ppm)				
Sample ID	Carbon	Stainless	Difference	RPD	
BSS-042	16.1	35.6	-19.5	-75.4	
BSS-043	18	18.8	-0.8	-4.3	
BSS-044	20.7	39	-18.3	-61.3	
BSS-045	35.3	84.9	-49.6	-82.5	
BSS-072	10.2	5.13	5.07	66.1	
BSS-073	30.4	13.2	17.2	78.9	
BSS-074	33.7	29.6	4.1	13.0	
BSS-092	8.4	21.8	-13.4	-88.7	
BSS-093	23.4	28.2	-4.8	-18.6	
BSS-094	17.6	19	-1.4	-7.7	
BSS-102	9.7	9.393	0.307	3.2	
BSS-103	27	116.1	-89.1	-124.5	
BSS-104	28	38.26	-10.26	-31.0	
BSS-105	8.8	5.622	3.178	44.1	
BSS-112	32.36	33.59	-1.23	-3.7	
BSS-113	12.75	37.43	-24.68	-98.4	
BSS-114	45.21	40.86	4.35	10.1	
BSS-115	51.97	65.41	-13.44	-22.9	
BSS-201	27.15	17.41	9.74	43.7	
BSS-202	23.72	7.953	15.767	99.6	
BSS-203	5.485	10.83	-5.345	-65.5	
BSS-212	6.719	3.085	3.634	74.1	
BSS-213	31.98	20.29	11.69	44.7	
BSS-214	18.1	20.84	-2.74	-14.1	
BSS-222	3.862	9.598	-5.736	-85.2	
BSS-223	8.425	6.856	1.569	20.5	

RPD denotes the Relative Percent Difference

$RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$

Carbon/Stainless Steel Sampler Comparison Data

Cu	Units:	(ppm)			
Sample ID	Carbon	Stainless	Difference	RPD	
BSS-042	3.59	3.89	-0.3	-8.0	
BSS-043	3.2	3.44	-0.24	-7.2	
BSS-044	3.23	4.6	-1.37	-35.0	
BSS-045	8.19	5.74	2.45	35.2	
BSS-072	3.99	2.71	1.28	38.2	
BSS-073	0.78	4.34	-3.56	-139.1	
BSS-074	4.77	5.77	-1	-19.0	
BSS-092	2.02	1.3	0.72	43.4	
BSS-093	6.4	5.4	1	16.9	
BSS-094	2.6	3.2	-0.6	-20.7	
BSS-102	4.72	4.45	0.27	5.9	
BSS-103	4.72	7.226	-2.506	-42.0	
BSS-104	8	14.94	-6.94	-60.5	
BSS-105	3.8	5.608	-1.808	-38.4	
BSS-112	11.43	11.38	0.05	0.4	
BSS-113	3.834	10.43	-6.596	-92.5	
BSS-114	14.12	13.03	1.09	8.0	
BSS-115	9.904	10.28	-0.376	-3.7	
BSS-201	8.016	5.437	2.579	38.3	
BSS-202	8.642	5.048	3.594	52.5	
BSS-203	3.172	5.821	-2.649	-58.9	
BSS-212	3.493	2.015	1.478	53.7	
BSS-213	3.64	7.456	-3.816	-68.8	
BSS-214	8.784	7.365	1.419	17.6	
BSS-222	2.108	4.144	-2.036	-65.1	
BSS-223	1.849	2.196	-0.347	-17.2	

RPD denotes the Relative Percent Difference

$RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$

Carbon/Stainless Steel Sampler Comparison Data

Fe	Units:	(ppm)			
Sample ID	Carbon	Stainless	Difference	RPD	
BSS-042	24600	13800	10800	56.3	
BSS-043	12660	37000	-24340	-98.0	
BSS-044	34400	27000	7400	24.1	
BSS-045	62600	28600	34000	74.6	
BSS-072	11340	8220	3120	31.9	
BSS-073	79600	26800	52800	99.2	
BSS-074	49000	46000	3000	6.3	
BSS-092	2020	3240	-1220	-46.4	
BSS-093	19860	23440	-3580	-16.5	
BSS-094	7600	4685	2915	47.5	
BSS-102	8660	6685	1975	25.7	
BSS-103	28600	32880	-4280	-13.9	
BSS-104	33800	42000	-6200	-15.9	
BSS-105	15300	8393	6907	58.3	
BSS-112	17300	18770	-1470	-8.2	
BSS-113	7502	21890	-14388	-97.9	
BSS-114	27510	24550	2960	11.4	
BSS-115	30170	36950	-6780	-20.2	
BSS-201	25730	19020	6710	30.0	
BSS-202	25040	14160	10880	55.5	
BSS-203	7731	15310	-7579	-65.8	
BSS-212	3237	1781	1456	58.0	
BSS-213	16690	18730	-2040	-11.5	
BSS-214	22560	21840	720	3.2	
BSS-222	1426	7118	-5692	-133.2	
BSS-223	1313	4046	-2733	-102.0	

RPD denotes the Relative Percent Difference

$RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$

Carbon/Stainless Steel Sampler Comparison Data

K	Units:	(ppm)				
Sample ID		Carbon	Stainless		Difference	RPD
BSS-042		150	LT 40			
BSS-043	LT	80	181			
BSS-044		81.9	174		-92.1	-72.0
BSS-045		243	LT 40			
BSS-072		138	LT 40			
BSS-073		47.6	72.9		-25.3	-42.0
BSS-074	LT	40	LT 40			
BSS-092	LT	360	LT 360			
BSS-093	LT	360	LT 360			
BSS-094	LT	360	LT 360			
BSS-102	LT	325	149.3			
BSS-103	LT	325	404.8			
BSS-104	LT	325	232.3			
BSS-105	LT	325	122.8			
BSS-112		477.8	471.2		6.6	1.4
BSS-113		66.37	199.1		-132.73	-100.0
BSS-114		56.41	338.5		-282.09	-142.9
BSS-115		172.6	285.4		-112.8	-49.3
BSS-201		258.8	39.82		218.98	146.7
BSS-202		192.5	46.46		146.04	122.2
BSS-203		152.6	LT 326			
BSS-212		86.28	46.46		39.82	60.0
BSS-213	LT	800	212.4			
BSS-214		96.23	156		-59.77	-47.4
BSS-222	LT	800	99.55			
BSS-223	LT	800	LT 326			

RPD denotes the Relative Percent Difference

$RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$

Carbon/Stainless Steel Sampler Comparison Data

Na	Units:	(ppm)			
Sample ID	Carbon	Stainless	Difference	RPD	
BSS-042	33.9	22.6	11.3	40.0	
BSS-043	41	51.5	-10.5	-22.7	
BSS-044	25.9	52.2	-26.3	-67.3	
BSS-045	39.5	70.4	-30.9	-56.2	
BSS-072	37.6	25.8	11.8	37.2	
BSS-073	28.6	35.5	-6.9	-21.5	
BSS-074	41.5	34.5	7	18.4	
BSS-092	56.4	30.6	25.8	59.3	
BSS-093	45.6	61.2	-15.6	-29.2	
BSS-094	40.6	40.9	-0.3	-0.7	
BSS-102	210	63.16	146.84	107.5	
BSS-103	760	50.06	709.94	175.3	
BSS-104	321	59.42	261.58	137.5	
BSS-105	236	42.57	193.43	138.9	
BSS-112	78.75	76.57	2.18	2.8	
BSS-113	70.64	87.8	-17.16	-21.7	
BSS-114	88.11	87.8	0.31	0.4	
BSS-115	73.76	56.92	16.84	25.8	
BSS-201	47.25	57.86	-10.61	-20.2	
BSS-202	54.11	49.12	4.99	9.7	
BSS-203	51.93	46.32	5.61	11.4	
BSS-212	47.88	35.24	12.64	30.4	
BSS-213	63.34	42.88	20.46	38.5	
BSS-214	41.64	41.33	0.31	0.7	
BSS-222	36.34	49.43	-13.09	-30.5	
BSS-223	33.14	28.69	4.45	14.4	

RPD denotes the Relative Percent Difference

$$RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$$

Carbon/Stainless Steel Sampler Comparison Data

Ni	Units:	(ppm)				
Sample ID		Carbon	Stainless	Difference		RPD
BSS-042		10.9	5.79	5.11		61.2
BSS-043		11.4	12	-0.6		-5.1
BSS-044		7.66	11.7	-4.04		-41.7
BSS-045		15.1	15.8	-0.7		-4.5
BSS-072		6.24	16.2	-9.96		-88.8
BSS-073		8.35	7.35	1		12.7
BSS-074		7.54	10.8	-3.26		-35.6
BSS-092	LT	4.2	LT 4.2			
BSS-093	LT	4.2	LT 4.2			
BSS-094	LT	4.2	LT 4.2			
BSS-102	LT	4.2	5.37			
BSS-103	LT	4.2	11.17			
BSS-104		6.3	11.58	-5.28		-59.1
BSS-105	LT	4.2	2.283			
BSS-112		16.78	14.07	2.71		17.6
BSS-113		7.047	11.91	-4.863		-51.3
BSS-114		13.32	13.73	-0.41		-3.0
BSS-115		11.44	12.95	-1.51		-12.4
BSS-201		5.121	3.939	1.182		26.1
BSS-202		8.531	3.55	4.981		82.5
BSS-203		2.875	2.353	0.522		20.0
BSS-212		2.677	LT 4.2			
BSS-213	LT	4.2	11.33			
BSS-214		3.739	7.872	-4.133		-71.2
BSS-222	LT	5.2	2.181			
BSS-223		6.762	0.646	6.116		165.1

RPD denotes the Relative Percent Difference

$RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$

Carbon/Stainless Steel Sampler Comparison Data

Pb	Units:	(ppm)			
Sample ID		Carbon	Stainless	Difference	RPD
BSS-042		11.4	5.78	5.62	65.4
BSS-043		11.6	5.13	6.47	77.3
BSS-044		13.1	5.24	7.86	85.7
BSS-045		14	6.67	7.33	70.9
BSS-072		3.05	4.14	-1.09	-30.3
BSS-073		7.12	6.2	0.92	13.8
BSS-074		10.9	6.3	4.6	53.5
BSS-092		3.45	3.05	0.4	12.3
BSS-093		6.54	6.27	0.27	4.2
BSS-094		7.84	5.52	2.32	34.7
BSS-102		6.52	7.18	-0.66	-9.6
BSS-103		9.53	8.5	1.03	11.4
BSS-104		6.6	14.1	-7.5	-72.5
BSS-105		4.45	8.3	-3.85	-60.4
BSS-112		15.4	13.6	1.8	12.4
BSS-113		4.89	14.1	-9.21	-97.0
BSS-114	LT	12.7	10.5		
BSS-115		14.6	6.29	8.31	79.6
BSS-201		7.01	6.3	0.71	10.7
BSS-202		7.83	4.95	2.88	45.1
BSS-203		8.89	7.98	0.91	10.8
BSS-212		3.07	2.15	0.92	35.2
BSS-213	LT	6.75	6.24		
BSS-214		6.67	6.45	0.22	3.4
BSS-222		7.32	1.77	5.55	122.1
BSS-223		6.3	3.4	2.9	59.8

RPD denotes the Relative Percent Difference

$RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$

Carbon/Stainless Steel Sampler Comparisor Data

Zn	Units:	(ppm)			
Sample ID	Carbon	Stainless	Difference	RPD	
BSS-042	21.3	13.9	7.4	42.0	
BSS-043	18.4	19.3	-0.9	-4.8	
BSS-044	15.6	16.9	-1.3	-8.0	
BSS-045	28.6	31.5	-2.9	-9.7	
BSS-072	16.8	31.8	-15	-61.7	
BSS-073	19.6	16.5	3.1	17.2	
BSS-074	13.7	19.6	-5.9	-35.4	
BSS-092	12.6	5.8	6.8	73.9	
BSS-093	10.5	9	1.5	15.4	
BSS-094	7.65	10.2	-2.55	-28.6	
BSS-102	16.8	9.949	6.851	51.2	
BSS-103	14.2	11.43	2.77	21.6	
BSS-104	18	14.75	3.25	19.8	
BSS-105	11.2	9.395	1.805	17.5	
BSS-112	28.46	26.26	2.2	8.0	
BSS-113	23.94	18.26	5.68	26.9	
BSS-114	33.42	19	14.42	55.0	
BSS-115	22.37	14.62	7.75	41.9	
BSS-201	10.51	21.05	-10.54	-66.8	
BSS-202	12.05	5.062	6.988	81.7	
BSS-203	10.46	12.24	-1.78	-15.7	
BSS-212	10.76	4.444	6.316	83.1	
BSS-213	15.82	16.19	-0.37	-2.3	
BSS-214	12.67	9.093	3.577	32.9	
BSS-222	10.11	11.16	-1.05	-9.9	
BSS-223	7.72	6.467	1.253	17.7	

RPD denotes the Relative Percent Difference

$RPD = ((\text{Carbon} - \text{Stainless}) / (\text{Carbon} + \text{Stainless})) * 200$

**GEOCHEMICAL AND PHYSICAL PROPERTIES OF SOILS AND
SHALLOW SEDIMENTS AT THE SAVANNAH RIVER SITE**

Appendix C.7

metaTRACE/Weston Laboratory Comparison Data Summary

metaTRACE/Weston Laboratory Comparison Data

Aluminum Sample ID	(ppm)- metaTRACE	Weston	Difference	RPD
BSS-431	2485.7	2480	5.7	0.2
BSS-432	2426.8	2210	216.8	9.4
BSS-433	12627	19700	-7073	-43.8
BSS-434	10083	21600	-11517	-72.7
BSS-471	6435	5220	1215	20.8
BSS-472	8353.8	7180	1173.8	15.1
BSS-473	4850.6	4550	300.6	6.4
BSS-474	3559.6	3680	-120.4	-3.3
BSS-481	1399.6	1510	-110.4	-7.6
BSS-482	1886	2340	-454	-21.5
BSS-483	3407.2	2540	867.2	29.2
BSS-491	2461.2	2450	11.2	0.5
BSS-492	4147.8	3690	457.8	11.7
BSS-493	20492	20200	292	1.4
BSS-494	11849	10900	949	8.3
BSS-531	6073	6550	-477	-7.6
BSS-541	4418.3	2870	1548.3	42.5
BSS-542	13022	8010	5012	47.7
BSS-543	21989	10400	11589	71.6
BSS-544	25786	18000	7786	35.6
BSS-545	19520	5910	13610	107.0
BSS-551	4551.6	1960	2591.6	79.6
BSS-552	3015.7	6400	-3384.3	-71.9
BSS-553	2899.3	5000	-2100.7	-53.2
BSS-562	1221.4	1270	-48.6	-3.9

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Arsenic Sample ID	(ppm)	metaTRACE	Weston	Difference	RPD
BSS-431	LT	2	LT 1.6		
BSS-432	LT	2	LT 1.5		
BSS-433	LT	2	7.1		
BSS-434		3.6	10.5	-6.9	-97.9
BSS-471		2	2.4	-0.4	-18.2
BSS-472		2	2.1	-0.1	-4.9
BSS-473	LT	2	LT 1.7		
BSS-474	LT	2	LT 1.8		
BSS-481	LT	2	LT 1.6		
BSS-482	LT	2	LT 1.6		
BSS-483	LT	2	LT 1.6		
BSS-491	LT	2	LT 1.6		
BSS-492	LT	2	LT 1.6		
BSS-493		2.4	LT 1.9		
BSS-494	LT	2	1.9		
BSS-531	LT	2	5		
BSS-541	LT	2	LT 1.6		
BSS-542		3.2	LT 1.6		
BSS-543		2	2.3	-0.3	-14.0
BSS-544	LT	2	4.1		
BSS-545	LT	2	5		
BSS-551	LT	2	LT 1.7		
BSS-552	LT	2	2		
BSS-553	LT	2	2.6		
BSS-562		2	LT 1.6		

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Barium Sample ID	(ppm) - metaTRACE		Weston	Difference	RPD
BSS-431	10.4		10.8	-0.4	-3.8
BSS-432	12.6		11.4	1.2	10.0
BSS-433	25.9		20.9	5	21.4
BSS-434	10.5		22.2	-11.7	-71.6
BSS-471	5.8	LT	5.3		
BSS-472	7.4		7.9	-0.5	-6.5
BSS-473	4.2	LT	5.2		
BSS-474	2.4	LT	5.6		
BSS-481	3	LT	5.1		
BSS-482	5.4		5.8	-0.4	-7.1
BSS-483	4	LT	5.2		
BSS-491	15.5		16.4	-0.9	-5.6
BSS-492	20.6		18.9	1.7	8.6
BSS-493	19.1		19.5	-0.4	-2.1
BSS-494	7.4		7.1	0.3	4.1
BSS-531	9		8.8	0.2	2.2
BSS-541	17.1		12.7	4.4	29.5
BSS-542	47.1		40.7	6.4	14.6
BSS-543	36.6		29.5	7.1	21.5
BSS-544	24.2		16.8	7.4	36.1
BSS-545	8.2	LT	5.5		
BSS-551	2.3	LT	5.4		
BSS-552	1.4	LT	5.2		
BSS-553	1.7	LT	5		
BSS-562	3.6	LT	5		

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Cadmium Sample ID	(ppm)	metaTRACE	Weston	Difference	RPD
BSS-431	LT	0.6	LT 0.4		
BSS-432	LT	0.6	LT 0.39		
BSS-433	LT	0.6	LT 0.46		
BSS-434	LT	0.6	0.74		
BSS-471		0.6	0.45	0.15	28.6
BSS-472	LT	0.6	0.68		
BSS-473	LT	0.6	LT 0.42		
BSS-474	LT	0.6	0.51		
BSS-481	LT	0.6	LT 0.41		
BSS-482	LT	0.6	LT 0.41		
BSS-483	LT	0.6	LT 0.41		
BSS-491	LT	0.6	LT 0.41		
BSS-492	LT	0.6	LT 0.41		
BSS-493	LT	0.6	0.72		
BSS-494	LT	0.6	0.51		
BSS-531	LT	0.6	LT 0.43		
BSS-541	LT	0.6	LT 0.4		
BSS-542		0.6	0.41	0.19	37.6
BSS-543	LT	0.6	0.48		
BSS-544	LT	0.6	0.61		
BSS-545	LT	0.6	0.86		
BSS-551	LT	0.6	LT 0.43		
BSS-552	LT	0.6	LT 0.42		
BSS-553	LT	0.6	LT 0.4		
BSS-562	LT	0.6	LT 0.4		

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Chromium	(ppm) -				
Sample ID	metaTRACE	Weston	Difference	RPD	
BSS-431	3.3	2.7	0.6	20.0	
BSS-432	3.1	2.7	0.4	13.8	
BSS-433	21.4	34.5	-13.1	-46.9	
BSS-434	35.2	50.1	-14.9	-34.9	
BSS-471	10	11.4	-1.4	-13.1	
BSS-472	24.6	22	2.6	11.2	
BSS-473	12	9.6	2.4	22.2	
BSS-474	7.6	7	0.6	8.2	
BSS-481	5	2.5	2.5	66.7	
BSS-482	6.2	3.2	3	63.8	
BSS-483	6	3.6	2.4	50.0	
BSS-491	3.8	3.2	0.6	17.1	
BSS-492	3.7	3.5	0.2	5.6	
BSS-493	21.9	23.3	-1.4	-6.2	
BSS-494	13.4	12.6	0.8	6.2	
BSS-531	15.4	15.5	-0.1	-0.6	
BSS-541	4.9	3.8	1.1	25.3	
BSS-542	13.9	7	6.9	66.0	
BSS-543	21.6	10.6	11	68.3	
BSS-544	22.5	22.4	0.1	0.4	
BSS-545	31.3	19.6	11.7	46.0	
BSS-551	21.4	4.8	16.6	126.7	
BSS-552	7.3	7.7	-0.4	-5.3	
BSS-553	10.8	9.5	1.3	12.8	
BSS-562	5.8	3.5	2.3	49.5	

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Copper Sample ID	(ppm) - metaTRACE		Weston	Difference	RPD
BSS-431	1.3	LT	2		
BSS-432	1		2.3	-1.3	-78.8
BSS-433	5		6.8	-1.8	-30.5
BSS-434	5.4		7.2	-1.8	-28.6
BSS-471	2.6	LT	2.1		
BSS-472	5.2		5.4	-0.2	-3.8
BSS-473	3.8		3.6	0.2	5.4
BSS-474	2.6		2.4	0.2	8.0
BSS-481	1.6		2.9	-1.3	-57.8
BSS-482	2		2.2	-0.2	-9.5
BSS-483	2.6		2.5	0.1	3.9
BSS-491	2.3	LT	2		
BSS-492	1.5	LT	2.1		
BSS-493	7.1		4.7	2.4	40.7
BSS-494	4.3		3.7	0.6	15.0
BSS-531	3.8		2.4	1.4	45.2
BSS-541	2.1		2.4	-0.3	-13.3
BSS-542	4.5		2.7	1.8	50.0
BSS-543	5.4		2.8	2.6	63.4
BSS-544	6.9		4.9	2	33.9
BSS-545	6.6	LT	2.2		
BSS-551	3.5	LT	2.2		
BSS-552	1.3	LT	2.1		
BSS-553	2.1		3	-0.9	-35.3
BSS-562	1.6	LT	2		

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Iron Sample ID	(ppm) - metaTRACE	Weston	Difference	RPD
BSS-431	1446.9	1190	256.9	19.5
BSS-432	1807.7	1690	117.7	6.7
BSS-433	14951	31900	-16949	-72.4
BSS-434	31855	36600	-4745	-13.9
BSS-471	6341.8	8150	-1808.2	-25.0
BSS-472	15371	14200	1171	7.9
BSS-473	6893.6	6550	343.6	5.1
BSS-474	4531	5470	-939	-18.8
BSS-481	1634.6	1630	4.6	0.3
BSS-482	2243.8	2490	-246.2	-10.4
BSS-483	4192.2	3510	682.2	16.9
BSS-491	1232.5	1290	-57.5	-4.6
BSS-492	2289.1	1980	309.1	14.5
BSS-493	16598	20700	-4102	-22.0
BSS-494	7718.3	8100	-381.7	-4.8
BSS-531	12566	14100	-1534	-11.5
BSS-541	2067.1	1670	397.1	21.3
BSS-542	7003.1	5660	1343.1	21.2
BSS-543	15525	9460	6065	48.5
BSS-544	16981	18100	-1119	-6.4
BSS-545	27941	19600	8341	35.1
BSS-551	8575.6	3770	4805.6	77.9
BSS-552	4432.3	4970	-537.7	-11.4
BSS-553	4799.2	4540	259.2	5.6
BSS-562	1929.4	1840	89.4	4.7

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Lead Sample ID	(ppm) - metaTRACE	Weston	Difference	RPD
BSS-431	3.9	6.6	-2.7	-51.4
BSS-432	LT 1	LT 4.8		
BSS-433	4.4	17	-12.6	-117.8
BSS-434	6	22	-16	-114.3
BSS-471	3.6	18	-14.4	-133.3
BSS-472	6.4	14	-7.6	-74.5
BSS-473	6	8	-2	-28.6
BSS-474	4.1	8.6	-4.5	-70.9
BSS-481	1.6	8.9	-7.3	-139.0
BSS-482	LT 1	5.7		
BSS-483	2.4	7.9	-5.5	-106.8
BSS-491	3.5	8.9	-5.4	-87.1
BSS-492	3.2	7.9	-4.7	-84.7
BSS-493	4.7	16	-11.3	-109.2
BSS-494	2.3	10	-7.7	-125.2
BSS-531	3.3	8.3	-5	-86.2
BSS-541	6	11	-5	-58.8
BSS-542	9.2	13	-3.8	-34.2
BSS-543	6.1	11	-4.9	-57.3
BSS-544	6.9	13	-6.1	-61.3
BSS-545	5.6	6.2	-0.6	-10.2
BSS-551	2.3	LT 5.4		
BSS-552	1	7.8	-6.8	-154.5
BSS-553	1.5	8.8	-7.3	-141.7
BSS-562	LT 1	LT 5		

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Magnesium Sample ID	(ppm)- metaTRACE	Weston	Difference	RPD
BSS-431	34.65	72.8	-38.15	-71.0
BSS-432	91.71	55.6	36.11	49.0
BSS-433	121.1	22.8	98.3	136.6
BSS-434	137.2	250	-112.8	-58.3
BSS-471	63.49	41.7	21.79	41.4
BSS-472	111.7	68.1	43.6	48.5
BSS-473	33.75	37.8	-4.05	-11.3
BSS-474	40.53	27.9	12.63	36.9
BSS-481	60.04	44	16.04	30.8
BSS-482	47.72	60.2	-12.48	-23.1
BSS-483	25.25	25.5	-0.25	-1.0
BSS-491	57.27	52.7	4.57	8.3
BSS-492	93.58	78.1	15.48	18.0
BSS-493	166.5	193	-26.5	-14.7
BSS-494	81.48	56.2	25.28	36.7
BSS-531	94.07	48.5	45.57	63.9
BSS-541	61.28	58.1	3.18	5.3
BSS-542	163.4	124	39.4	27.4
BSS-543	111.6	133	-21.4	-17.5
BSS-544	122.9	173	-50.1	-33.9
BSS-545	94.62	36.1	58.52	89.5
BSS-551	30.85	25	5.85	20.9
BSS-552	34.86	50.5	-15.64	-36.6
BSS-553	31.4	37.6	-6.2	-18.0
BSS-562	102.8	54.9	47.9	60.7

RPD denotes Relative Percent Difference

$$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$$

metaTRACE/Weston Laboratory Comparison Data

Manganese Sample ID	(ppm) - metaTRACE	Weston	Difference	RPD
BSS-431	32.25	34.5	-2.25	-6.7
BSS-432	12.64	15	-2.36	-17.1
BSS-433	3.294	13.7	-10.406	-122.5
BSS-434	3.37	15.2	-11.83	-127.4
BSS-471	4.519	41.7	-37.181	-160.9
BSS-472	4.213	34.9	-30.687	-156.9
BSS-473	8.043	4.8	3.243	50.5
BSS-474	2.528	5.6	-3.072	-75.6
BSS-481	5.132	6.8	-1.668	-28.0
BSS-482	6.358	14.5	-8.142	-78.1
BSS-483	4.673	8	-3.327	-52.5
BSS-491	75.91	99.7	-23.79	-27.1
BSS-492	13.18	17.2	-4.02	-26.5
BSS-493	LT 1.6	7.3		
BSS-494	LT 1.6	2.8		
BSS-531	7.583	10.2	-2.617	-29.4
BSS-541	90	115	-25	-24.4
BSS-542	125.9	201	-75.1	-45.9
BSS-543	10.88	20.4	-9.52	-60.9
BSS-544	7.503	20.7	-13.197	-93.6
BSS-545	3.6	8.6	-5	-82.0
BSS-551	3.294	5.6	-2.306	-51.9
BSS-552	3.524	8.5	-4.976	-82.8
BSS-553	2.834	6.2	-3.366	-74.5
BSS-562	5.898	6.2	-0.302	-5.0

RPD denotes Relative Percent Difference
 $RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Mercury Sample ID	(ppm)- metaTRACE	Weston	Difference	RPD
BSS-431	LT 0.1	LT 0.1		
BSS-432	0.15	LT 0.1		
BSS-433	LT 0.1	LT 0.12		
BSS-434	LT 0.1	LT 0.12		
BSS-471	LT 0.1	LT 0.11		
BSS-472	LT 0.1	LT 0.12		
BSS-473	LT 0.1	LT 0.11		
BSS-474	LT 0.1	LT 0.23		
BSS-481	LT 0.1	LT 0.1		
BSS-482	LT 0.1	LT 0.1		
BSS-483	LT 0.1	LT 0.11		
BSS-491	LT 0.1	LT 0.11		
BSS-492	LT 0.1	LT 0.11		
BSS-493	0.11	LT 0.12		
BSS-494	LT 0.1	LT 0.11		
BSS-531	LT 0.1	LT 0.11		
BSS-541	LT 0.1	LT 0.11		
BSS-542	LT 0.1	LT 0.11		
BSS-543	LT 0.1	0.17		
BSS-544	0.17	LT 0.11		
BSS-545	LT 0.1	LT 0.11		
BSS-551	LT 0.1	LT 0.11		
BSS-552	0.15	LT 0.11		
BSS-553	LT 0.1	LT 0.11		
BSS-562	LT 0.1	LT 0.1		

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Nickel Sample ID	(ppm) - metaTRACE		Weston	Difference	RPD
BSS-431		2	LT 2		
BSS-432	LT	2	LT 1.9		
BSS-433		3.9	3.8	0.1	2.6
BSS-434	LT	2	5.5		
BSS-471	LT	2	LT 2.1		
BSS-472		3.4	LT 2.3		
BSS-473		3	LT 2.1		
BSS-474		2.6	LT 2.2		
BSS-481		2.8	LT 2		
BSS-482		2.4	LT 2		
BSS-483	LT	2	LT 2.1		
BSS-491	LT	2	LT 2		
BSS-492	LT	2	2.1		
BSS-493		3.7	3	0.7	20.9
BSS-494	LT	2	LT 2.1		
BSS-531	LT	2	2.2		
BSS-541		2.6	LT 2		
BSS-542		5.6	2.3	3.3	83.5
BSS-543		5.1	2.1	3	83.3
BSS-544		3.8	3.5	0.3	8.2
BSS-545		3.8	LT 2.2		
BSS-551		2.2	LT 2.2		
BSS-552	LT	2	LT 2.1		
BSS-553	LT	2	LT 2		
BSS-562	LT	2	LT 2		

RPD denotes Relative Percent Difference

$$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$$

metaTRACE/Weston Laboratory Comparison Data

Potassium Sample ID	(ppm) - metaTRACE	Weston	Difference	RPD
BSS-431	LT 180	67.6		
BSS-432	LT 180	45.8		
BSS-433	LT 180	166		
BSS-434	LT 180	207		
BSS-471	270	70.6	199.4	117.1
BSS-472	298	51.5	246.5	141.1
BSS-473	324	35.6	288.4	160.4
BSS-474	180	31.5	148.5	140.4
BSS-481	196	42	154	129.4
BSS-482	274	42.9	231.1	145.9
BSS-483	184	30.8	153.2	142.6
BSS-491	LT 180	57.5		
BSS-492	LT 180	73.2		
BSS-493	278	162	116	52.7
BSS-494	LT 180	70.8		
BSS-531	206	68.9	137.1	99.7
BSS-541	LT 180	53.8		
BSS-542	LT 180	97.9		
BSS-543	LT 180	104		
BSS-544	180	133	47	30.0
BSS-545	LT 180	49.3		
BSS-551	LT 180	21.6		
BSS-552	LT 180	52.2		
BSS-553	LT 180	34		
BSS-562	LT 180	42.1		

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Selenium	(ppm) -				
Sample ID		metaTRACE		Weston	Difference
					RPD
BSS-431	LT	0.4	LT	0.79	
BSS-432	LT	4	LT	0.77	
BSS-433	LT	0.4	LT	0.92	
BSS-434		0.42	LT	0.87	
BSS-471	LT	0.4	LT	0.85	
BSS-472	LT	0.4	LT	0.9	
BSS-473	LT	4	LT	0.84	
BSS-474	LT	0.4	LT	0.89	
BSS-481	LT	0.4	LT	0.82	
BSS-482	LT	4	LT	0.8	
BSS-483	LT	0.4	LT	0.82	
BSS-491	LT	0.4	LT	0.81	
BSS-492	LT	0.4	LT	0.82	
BSS-493	LT	4	LT	0.94	
BSS-494	LT	0.4	LT	0.82	
BSS-531		0.64	LT	0.86	
BSS-541	LT	0.4	LT	0.8	
BSS-542	LT	0.4	LT	0.82	
BSS-543	LT	0.4	LT	0.83	
BSS-544	LT	4	LT	0.9	
BSS-545		0.55	LT	0.87	
BSS-551		0.46	LT	0.86	
BSS-552	LT	4	LT	0.12	
BSS-553	LT	0.4	LT	0.81	
BSS-562	LT	0.4	LT	0.8	

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Silver Sample ID	(ppm) - metaTRACE	Weston	Difference	RPD
BSS-431	LT 1	LT 3		
BSS-432	LT 1	LT 2.9		
BSS-433	LT 1	LT 3.4		
BSS-434	LT 1	LT 3.3		
BSS-471	LT 1	3.2		
BSS-472	LT 1	LT 3.4		
BSS-473	LT 1	LT 3.1		
BSS-474	LT 1	LT 3.3		
BSS-481	LT 1	LT 3.1		
BSS-482	LT 1	LT 3		
BSS-483	LT 1	LT 3.1		
BSS-491	LT 1	LT 3		
BSS-492	LT 1	LT 3.1		
BSS-493	LT 1	LT 3.5		
BSS-494	LT 1	LT 3.1		
BSS-531	LT 1	LT 3.3		
BSS-541	LT 1	LT 3		
BSS-542	LT 1	LT 3.1		
BSS-543	LT 1	LT 3.1		
BSS-544	LT 1	LT 3.4		
BSS-545	LT 1	LT 3.3		
BSS-551	LT 1	LT 3.2		
BSS-552	LT 1	LT 3		
BSS-553	1.8	LT 3		
BSS-562	LT 1	LT 3		

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Sodium Sample ID	(ppm) - metaTRACE	Weston	Difference	RPD
BSS-431	26.7	23.7	3	11.9
BSS-432	26.1	16	10.1	48.0
BSS-433	43.5	30.9	12.6	33.9
BSS-434	52	44.2	7.8	16.2
BSS-471	46.4	23.3	23.1	66.3
BSS-472	38	20.9	17.1	58.1
BSS-473	29.6	27.6	2	7.0
BSS-474	42.8	20.8	22	69.2
BSS-481	24.6	24.5	0.1	0.4
BSS-482	99.4	23.2	76.2	124.3
BSS-483	123.2	17.8	105.4	149.5
BSS-491	27.4	22.3	5.1	20.5
BSS-492	21.6	22.3	-0.7	-3.2
BSS-493	45.6	30.8	14.8	38.7
BSS-494	25.1	27	-1.9	-7.3
BSS-531	13.8	22.1	-8.3	-46.2
BSS-541	31.4	22.5	8.9	33.0
BSS-542	42.6	22.9	19.7	60.2
BSS-543	49.1	22.3	26.8	75.1
BSS-544	44.3	43.7	0.6	1.4
BSS-545	44.3	23.2	21.1	62.5
BSS-551	24.4	17.5	6.9	32.9
BSS-552	20.5	25.6	-5.1	-22.1
BSS-553	47.5	21.2	26.3	76.6
BSS-562	14.8	19.8	-5	-28.9

RPD denotes Relative Percent Difference

$$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$$

metaTRACE/Weston Laboratory Comparison Data

Zinc	(ppm)				
Sample ID	metaTRACE	Weston	Difference	RPD	
BSS-431	5.8	5.3	0.5	9.0	
BSS-432	4.7	4.3	0.4	8.9	
BSS-433	13.6	14.6	-1	-7.1	
BSS-434	24.6	85.3	-60.7	-110.5	
BSS-471	11.4	4.7	6.7	83.2	
BSS-472	6.2	6.2	0	0.0	
BSS-473	7.4	6.4	1	14.5	
BSS-474	5	3.5	1.5	35.3	
BSS-481	5.4	10.5	-5.1	-64.2	
BSS-482	13.2	5.5	7.7	82.4	
BSS-483	4.2	2.4	1.8	54.5	
BSS-491	5.1	3.5	1.6	37.2	
BSS-492	4.1	3.4	0.7	18.7	
BSS-493	4.2	10.7	-6.5	-87.2	
BSS-494	8.3	4.6	3.7	57.4	
BSS-531	3.8	6.1	-2.3	-46.5	
BSS-541	5.2	3.5	1.7	39.1	
BSS-542	12.3	4.9	7.4	86.0	
BSS-543	13.4	6.1	7.3	74.9	
BSS-544	9.8	8.4	1.4	15.4	
BSS-545	9.8	5.6	4.2	54.5	
BSS-551	4.2	2.3	1.9	58.5	
BSS-552	4.9	3.3	1.6	39.0	
BSS-553	4.1	4.1	0	0.0	
BSS-562	5.6	4.1	1.5	30.9	

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Lithium Sample ID	(ppm) - metaTRACE	Weston	Difference	RPD
BSS-431	LT 10	LT 2		
BSS-432	LT 10	LT 2		
BSS-433	LT 10	2.7		
BSS-434	LT 10	LT 2		
BSS-471	LT 10	LT 2		
BSS-472	LT 10	LT 2		
BSS-473	LT 10	LT 2.0		
BSS-474	LT 10	LT 2		
BSS-481	LT 10	LT 2		
BSS-482	LT 10	LT 2		
BSS-483	LT 10	LT 2		
BSS-491	LT 10	LT 2		
BSS-492	LT 10	LT 2		
BSS-493	LT 10	6.2		
BSS-494	LT 10	3.5		
BSS-531	LT 10	LT 2		
BSS-541	LT 10	2		
BSS-542	LT 10	LT 2		
BSS-543	LT 10	2.8		
BSS-544	LT 10	2.1		
BSS-545	LT 10	LT 2		
BSS-551	LT 10	LT 2		
BSS-552	LT 10	LT 2		
BSS-553	LT 10	LT 2		
BSS-562	LT 10	LT 2		

RPD denotes Relative Percent Difference

$$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$$

metaTRACE/Weston Laboratory Comparison Data

Cyanide	(ppm) -					
Sample ID		metaTRACE		Weston	Difference	RPD
BSS-431	LT	0.25	LT	1		
BSS-432	LT	0.25	LT	1		
BSS-433	LT	0.25	LT	1.2		
BSS-434	LT	0.25	LT	1.2		
BSS-471	LT	0.25	LT	1.1		
BSS-472	LT	0.25	LT	1.2		
BSS-473	LT	0.25	LT	1.1		
BSS-474	LT	0.25	LT	2.3		
BSS-481	LT	0.25	LT	1		
BSS-482	LT	0.25	LT	1		
BSS-483	LT	0.25	LT	1.1		
BSS-491	LT	0.25	LT	1.1		
BSS-492	LT	0.25	LT	1.1		
BSS-493	LT	0.25	LT	1.2		
BSS-494	LT	0.25	LT	1.1		
BSS-531	LT	0.25	LT	1.1		
BSS-541	LT	0.25	LT	1.1		
BSS-542	LT	0.25	LT	1.1		
BSS-543	LT	0.25	LT	1.1		
BSS-544	LT	0.25	LT	1.1		
BSS-545	LT	0.25	LT	1.2		
BSS-551	LT	0.25	LT	1.1		
BSS-552	LT	0.25	LT	1.1		
BSS-553	LT	0.25	LT	1.1		
BSS-562	LT	0.25	LT	1		

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Sulfate Sample ID	(ppm)- metaTRACE		Weston	Difference	RPD
BSS-431	6.6	LT	52.1		
BSS-432	8.7	LT	52.9		
BSS-433	7.1	LT	59.5		
BSS-434	5	LT	58.3		
BSS-471	25.1	LT	54.4		
BSS-472	5	LT	59		
BSS-473	21.4	LT	57.4		
BSS-474	5	LT	113		
BSS-481	7.6	LT	52.3		
BSS-482	8.2	LT	52.5		
BSS-483	17.8	LT	53.1		
BSS-491	8.1	LT	52.8		
BSS-492	10.9	LT	53.4		
BSS-493	4.4	LT	58		
BSS-494	5	LT	55.9		
BSS-531	5	LT	55.4		
BSS-541	5.9	LT	53.1		
BSS-542	14.1	LT	53.5		
BSS-543	18.1	LT	56.1		
BSS-544	5	LT	57.1		
BSS-545	5	LT	58		
BSS-551	5	LT	55.5		
BSS-552	5.3	LT	54.8		
BSS-553	5	LT	56		
BSS-562	8.2	LT	51.9		

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

pH				
Sample ID	metaTRACE	Weston	Difference	RPD
BSS-431	6.22	6.1	0.12	1.9
BSS-432	5.11	5.7	-0.59	-10.9
BSS-433	4.61	5.5	-0.89	-17.6
BSS-434	4.15	5.6	-1.45	-29.7
BSS-471	5.31	5.1	0.21	4.0
BSS-472	5.27	5.3	-0.03	-0.6
BSS-473	5.25	5.3	-0.05	-0.9
BSS-474	5.37	5.3	0.07	1.3
BSS-481	5.81	4.4	1.41	27.6
BSS-482	5.99	5.1	0.89	16.1
BSS-483	5.49	5.3	0.19	3.5
BSS-491	5.5	5.1	0.4	7.5
BSS-492	5.49	5.7	-0.21	-3.8
BSS-493	5.28	5.6	-0.32	-5.9
BSS-494	5.51	5.2	0.31	5.8
BSS-531	5.18	5.3	-0.12	-2.3
BSS-541	5.55	5.3	0.25	4.6
BSS-542	5.66	5.5	0.16	2.9
BSS-543	5.61	5.3	0.31	5.7
BSS-544	5.54	5.4	0.14	2.6
BSS-545	5.56	5.6	-0.04	-0.7
BSS-551	5.48	5.7	-0.22	-3.9
BSS-552	5.48	5.7	-0.22	-3.9
BSS-553	5.56	5.7	-0.14	-2.5
BSS-562	5.68	5.1	0.58	10.8

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Total Organic Carbon					
Sample ID	metaTRACE	Weston	Difference	RPD	
BSS-431	3556	9090	-5534	-87.5	
BSS-432	2130	530	1600	120.3	
BSS-433	841	680	161	21.2	
BSS-434	860	1400	-540	-47.8	
BSS-471	5703	2180	3523	89.4	
BSS-472	595	1260	-665	-71.7	
BSS-473	243	460	-217	-61.7	
BSS-474	189	170	19	10.6	
BSS-481	4092	820	3272	133.2	
BSS-482	409	330	79	21.4	
BSS-483	208	130	78	46.2	
BSS-491	2957	4600	-1643	-43.5	
BSS-492	471	330	141	35.2	
BSS-493	764	990	-226	-25.8	
BSS-494	415	330	85	22.8	
BSS-531	386	1000	-614	-88.6	
BSS-541	3430	610	2820	139.6	
BSS-542	619	740	-121	-17.8	
BSS-543	2615	1080	1535	83.1	
BSS-544	1272	420	852	100.7	
BSS-545	305	480	-175	-44.6	
BSS-551	96	240	-144	-85.7	
BSS-552	97	70	27	32.3	
BSS-553	43	53.4	-10.4	-21.6	
BSS-562	300	660	-360	-75.0	

RPD denotes Relative Percent Difference
 $RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

metaTRACE/Weston Laboratory Comparison Data

Total Organic Halogens

Sample ID		metaTRACE		Weston	Difference	RPD
BSS-431	LT	10	LT	100		
BSS-432	LT	10	LT	100		
BSS-433	LT	10	LT	100		
BSS-434	LT	10	LT	100		
BSS-471	LT	10	LT	100		
BSS-472	LT	10	LT	100		
BSS-473	LT	10	LT	100		
BSS-474	LT	10	LT	100		
BSS-481	LT	10	LT	100		
BSS-482	LT	10	LT	100		
BSS-483	LT	10	LT	100		
BSS-491	LT	10	LT	100		
BSS-492	LT	10	LT	100		
BSS-493	LT	10	LT	100		
BSS-494	LT	10	LT	100		
BSS-531	LT	10	LT	100		
BSS-541	LT	10	LT	100		
BSS-542	LT	10	LT	100		
BSS-543	LT	10	LT	100		
BSS-544	LT	10	LT	100		
BSS-545	LT	10	LT	100		
BSS-551	LT	10	LT	100		
BSS-552	LT	10	LT	100		
BSS-553	LT	10		140		
BSS-562	LT	10	LT	100		

RPD denotes Relative Percent Difference

$RPD = ((\text{metaTRACE} - \text{Weston}) / (\text{metaTRACE} + \text{Weston})) * 200$

END

DATE FILMED

03 / 06 / 91