Microbial Physiology of Subsurface Aquifers at SRS (U)

by

C. B. Fliermans,

Westinghouse Savannah River Company

Savannah River Site

Aiken, South Carolina 29808

J. House

M. M. Franck

MASTER

DOE Contract No. DE-AC09-89SR18035

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MICROBIAL PHYSIOLOGY OF SUBSURFACE AQUIFERS AT SAVANNAH RIVER SITE

Carl B. Fliermans, John House and Marilyn M. Franck
Biotechnology Group
Westinghouse Savannah River Technology Center
Aiken, SC, USA

Milestone: TCC07 Characterization of Microorganisms in SRS Aquifers

EXECUTIVE SUMMARY:

Subsurface microbial communities differ in their physiological characteristics in relationship to depth and whether the organisms are associated with sediments or ground water. Investigations were undertaken to determine the response of the microbial communities present in the aquifers of SRS to selected organic compounds. Ground water samples were collected from P-24, P-28 and P-29 well clusters. Selected microbiological, physical and chemical parameters were measured for each water sample. Triplicate ground water samples (150 μ l), without concentration, were injected into each of the 96 wells of the GN-Biolog® plates. Plates were incubated for 3 weeks at *in situ* ground water temperatures and the reactions to the organic compounds present in the GN-Biolog® plates were evaluated. The data indicate that microbial populations and/or specific extracellular enzyme systems are present in the ground waters and degrade the compounds present in the Biolog® plates. The data indicate that given the limited samples, one can observe differences among the aquifers with regard to physiological parameters. The microbial consortia associated with surface aquifers are clearly different in their physiology when compared to the deep Black Creek or Middendorf aquifers. The investigation indicates that Biolog® technology is a useful tool to measure the physiological response of the microbial community present in the ground waters of SRS. Further it allows one to evaluate the versatility of the microbial subsurface ecosystem and to assess the potential for each of the aquifers to provide either enhanced or intrinsic bioremediation. Additionally, aquifers may be characterized based on their microbial community and subsequent activity rather than solely on the geological structure of the subsurface.

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Official: Bruce Hedrow
(Name and Title)
Date: 43 10/10/95

INTRODUCTION

As a result of various human activities, particularly those involving land disposal of chemical waste, the quality of ground water has become increasingly threatened. The total annual world production of synthetic organic chemicals is over 300 million tons, and more than 1000 new compounds are marketed each year (Fewson, 1988). It has been estimated that over 57 million metric tons of hazardous industrial waste were produced in the US during 1980 alone (Keswick, 1984). For these reasons, pollution of ground water due to hazardous waste is becoming a very serious problem with more than 10 million Americans using tap water with contaminants that exceed EPA standard levels (Knox, 1988).

Bacteria capable of degrading toxic organic chemicals have been isolated from aquatic systems, deep wells, and terrestrial subsurface sites (Little, *et al.*, 1988; Fliermans and Balkwill, 1988; Fliermans *et al.*, 1988; Efraymson and Alexander, 1991.) These microbial consortia represent resources that are physiologically diverse and economically important for genomic stability and the enhancement of bioremediation activities in the terrestrial subsurface. Procedures previously used to determine the microbial diversity of subsurface environments and their ability to degrade or mineralize toxic contaminants required repeated enrichments and exposure of organisms to various concentrations of toxic substances for weeks or months (Villarreal *et al.*, 1991; Hutchins, 1991). Because the use of heterotrophic aerobic bacteria in the bioremediation of contaminated sites is increasing (Abramowicz and Brennan, 1990; Anonymous, 1989), the capacity to quickly characterize potential degraders, access remediation strategies and evaluate subsurface communities and their recovery during and after perturbations will enhance bioremediation technologies.

The Savannah River Site is a 310 square mile facility owned by the U.S. Department of Energy and operated by the Westinghouse Savannah River Company. The site is near Aiken, South Carolina, and has been operated as a nuclear production facility for DOE since 1950. The production processes carried out over the past 40 years have generated considerable waste and waste sites. This waste includes radiological, heavy metals, organic solvents, sanitary landfills and other types of mixed wastes. Many contaminated environments at SRS have been identified including both surface water and soils, subsurface sediment and ground water. Cleanup of these wastes and waste sites has become a top priority for DOE. Due to the large number of waste sites and large volume of contaminants at many of these sites a considerable amount of time and money will be required to complete the mandated cleanup. Thus, another priority stemming from this cleanup program is to develop and demonstrate new and innovative technologies that may decrease costs, decrease time, decrease environmental impact and/or result in a cleaner end point.

This report describes a rapid screening procedure used to test the enzymatic capabilities of bacterial consortia in ground water from well clusters P-24, P-28 and P-29. The response of these ground water microbial communities were evaluated for their ability to degrade selected organic substrates in the degradative process. Screening procedures using Biolog[®] multiwell plates (Biolog[®], Hayward, CA) are versatile, flexible, and suitable for testing a wide range of mixtures and concentrations of *in situ* enzymatic patterns, toxic chemicals and selected microorganisms. Biolog[®] technology was initially developed as a rapid, broad spectrum method for the biochemical identification of clinical microorganisms. Demand and creative application of this technology has resulted in the development of Biolog[®] plates for Gram-negative and Gram-positive bacteria, for yeast and *Lactobacillus* sp. The Biolog[®] identification library now has more than 1000 environmental species and strains (Biolog[®], 1994 Literature).

Microbial ecologists have extended the use of Biolog[®] plates from the identification of culture isolates to a tool for quantifying the metabolic patterns of mixed

cultures, consortia and entire microbial communities. Patterns that develop on Biolog[®] microplates are a result of the oxidation of the substrates by microorganisms in the inoculum and the subsequent reduction of the tetrazolium dye to form a color whose intensity is in response to detectable reactions. Depending upon the functional enzymes present in the isolate or community one of a possible 4×10^{28} patterns can be expressed (Biolog[®], 1991). The patterns are distinctive for isolates of different species and are now being used to distinguish the physiological ecology of various microbial communities.

Biolog[®] technology offers a unique capacity to measure functional aspects of bacterial enzyme activity in a reproducible and quantifiable way. Biolog[®] plate patterns develop due to enzyme activity in each positive well. The enzyme activity of pure cultures enables the identification of the isolates based on the phenological patterns. When water samples collected from natural aquatic systems are inoculated into Biolog[®] plates the resulting patterns are reflective of the enzymes expressed by the functioning microbial community and may be defined as ecologically functional or ecofunctional enzymes.

Ecofunctional enzymes (EFE) are enzymes which are being expressed or used by or within a microbial community in order to enable individuals or microbial populations to survive, maintain or grow. Alternatively, EFE may be latent enzymes ready for expression under more favorable or opportunistic conditions. Such enzymes are present in every microbial community, and it is expected that the suite of EFE expressed at any moment by the microbial communities present in subsurface groundwaters is a direct reflection of the dominant and contributing microbial populations of that community and of the environmental factors impacting the ecosystem at the time of sampling.

MATERIAL and METHODS

Ground water samples were collected aseptically on a monthly schedule from 8 wells in the P-24 cluster; 6 wells in the P-28 cluster and 7 wells in the P-29 cluster. The well location, aquifer details and well construction features are given in Figure 1 and Table 1, respectively. Wells were sampled according to established protocol whereby either four (4) well volumes were pumped and/or chemical and physical parameters were stabilized before samples were collected. Four liter samples were collected. Each ground water sample was inoculated, without concentration, into triplicate GN-Biolog[®] (Biolog[®], Hayward, CA) microtiter plates at a level of 150 μ l per well. The plates were enclosed in sterile Whirl-Pak bags to prevent moisture loss and then incubated at 21°C (*in situ* mean ground water temperatures). After 21 days of incubation, plates were read on a microtiter plate reader (590 nm) used in conjunction with MicroLog 2, Release 2.01 software (Biolog[®], Hayward, CA). Data were collected as an optical density (OD) value for each of the 96 wells of the microtiter plate normalized against the control well, A1. If the A1 well (no nutrient source) had an OD value of 0.40 or over, the data for the plate was discarded.

Data were analyzed using prepared programs for the Macintosh, including Systat version 5.1 (Systat, Inc., Evanston, IL) and JMP, version 2 (SAS Institute Inc., Cary, NC) and using statistical tests as described by Zar (1984). The Tukey-Kramer test was used to test multiple comparisons of means. Any statistical probability equal to or less than 0.05 was considered significant.

RESULTS

Before each of the cluster wells could be sampled, each of the wells had to be refurbished and refitted with submersible pumps. Such reworking of the wells required a considerable amount of time, greater than 9 months, so that the biological assessment of

FORMATIONS	NUMBER OF SAMPLES
Tobacco Road	9
Dry Branch	15
McBean	0
Congaree	15
PeeDee	13
Black Creek	14
Middendorf	24

Biolog[®] redox technology is the basic component of the rapid screening procedure and is based on tetrazolium dye reduction as an indicator of enzyme systems capable of sole-carbon source utilization (Bochner, 1989 a, b; Garland Mills, 1991). Although originally designed to identify clinical bacterial isolates using 95 different sole carbon sources, the technology has been extended by Biolog[®] to identify environmental isolates, MPN of soil and ground water habitats (Wear, 1993); and rapid screening of bacteria capable of degrading toxic organic compounds (Gorden et al., 1993).

The basic procedures described here uses Biolog GN plates. Biolog GN and GP plates contain the same minimal nutritional factors along with a different organic substrate (Table 2) in each of the 95 wells in a microtiter plate. MT plates differ in that they have no organic substrates in any wells but only minimal nutritional factors as well as the tetrazolium dye present in each well. The oxidized tetrazolium dye contained in each well turns purple when reduced as a response to bacterial metabolic activity.

Unconcentrated ground water samples from each of the P-24, P-28 and P-29 cluster wells were inoculated into each microtiter plate well. The plates were incubated at ground water temperature for three weeks, and the color changes indicative of the characteristic metabolic patterns were recorded. Although the 95 different carbon sources in Biolog GN plates were pre-selected specifically for characterizing and differentiating Gram-negative and Gram-positive aerobic bacteria, respectively, they are also useful in demonstrating metabolic patterns for mixed cultures. Carbon sources in the Biolog[®] plates are dominated by 28 carbohydrates, 24 carboxylic acids, and 20 amino acids plus various amides, aromatic chemicals, and other compounds (Table 2). The A-1 well of the microtiter plate has no substrate, and thus no nutrient source with which to initiate a metabolic reaction with the indicator dye, and thus serves as a negative control.

The Biolog[®] automated plate reader was factory programmed to sense a threshold optical density value for each plate based on the color of the A-1 reference control well. Thus, the optical density readings which determined each inoculum pattern, were significantly above the threshold level. Ground water samples from 3 cluster wells were sampled monthly for a period of 2 months. The data are represented as the optical density for each of the enzyme systems capable of degrading the organic compounds present in the Biolog[®] assays. Each of the 95 compounds were analyzed for each of the cluster wells. The data indicate that selected aquifers of the cluster wells were variable in their response. The microbial community present in the ground water changed their activity against specific groups of compounds as well as stereo isomers of selected amino acids. The data provides data and information into the understanding and modification of the microbial ecology of subsurface environments.

AQUIFER DEPTH. Each of the major aquifers are plotted with respect to depth in Figure 2. The data indicate that the depth of each of the aquifers differ and span a formation. Both the Black Creek and Middendorf aquifer formations are significantly different from the mean depth of the aquifers sampled. Because the well clusters are located in different regions of SRS the formation depth are not the same. Each of the major compound groups as shown in Table 2 were analyzed for the EFE systems expressed at each sampling period for each of the sampled wells.

AQUIFER TEMPERATURE. Each of the major aquifers are plotted with respect to *in situ* ground water temperatures in Figure 3. The depths of the aquifers were not to the extent that elevated temperatures were observed. The deeper Black Creek and Middendorf aquifers were statistically elevated above the mean temperature (21°C) of the aquifers.

AQUIFER OXYGEN. Each of the major aquifers are plotted with respect to *in situ* oxygen content in Figure 4. All of the aquifers are oxygenated with the deeper aquifers of the Black Creek and Middendorf having a mean oxygen content of 1.3 and 2.2 ppm, respectively. PeeDee was the only aquifer that has anaerobic conditions with a mean concentration of less than 0.02ppm. The shallower aquifers of the Tobacco Road, Dry Branch, Congaree, and McBean average 7.9, 8.3, 7.6 and 8.8 ppm, respectively.

AQUIFER CONDUCTIVITY. Each of the major aquifers are plotted with respect to *in situ* conductivity content in Figure 5. The data demonstrates that there is no significant difference in conductivity among the aquifers.

AQUIFER pH. Each of the major aquifers are plotted with respect to *in situ* pH values as shown in Figure 6. All of the aquifers except the McBean have acidic pH values. The average pH of the aquifers is 6.25. The McBean aquifer has shown elevated pH values averaging 8.63 and may reflect the intrusion and influence of grout into the aquifer system.

AQUIFER REDOX VALUES. Each of the major aquifers are plotted with respect to *in situ* redox values as shown in Figure 7. None of the aquifers were under a negative redox although PeeDee, Middendorf and Black Creek aquifers were statistically lower than the mean redox of 235mv.

AQUIFER TOTAL BACTERIAL COUNTS. Each of the major aquifers are plotted with respect to *in situ* total bacterial counts per milliliter of ground water are shown in Figure 8. PeeDee aquifer was statistically elevated over the other aquifers, while each of the other aquifers were not statistically different from each other. Thus the inoculation of the Biolog[®] plates with ground water from each of the aquifers contained the same number of total bacteria within statistical significance.

CARBOHYDRATE UTILIZATION. The carbohydrate group was composed of 28 different carbohydrates that were utilized by the microbial consortia in the ground water from each of the cluster wells. Each of the major aquifers are plotted with respect to *in situ* carbohydrate utilization as shown in Figure 9. Carbohydrates were utilized most efficiently in the PeeDee and Tobacco Road aquifers. All but the Black Creek and the Middendorf aquifers were distinguished from each other on the basis of their carbohydrate utilization.

Figure 9a. N-Acetyl-D-galactosamine. The microbial community of the ground-water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for this specific carbohydrate. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9b. N-Acetyl-D-glucosamine. The microbial community of the ground-water of the Dry Branch aquifer demonstrated the greatest utilization activity for this specific carbohydrate. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9c. Adonitol. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9d. L-Arabinose. The microbial community of the ground water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for this specific carbohydrate. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9e. D-Arabitol. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carbohydrate. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9f. Cellobiose. The microbial community of the ground water of the shallow aquifer, Dry Branch, demonstrated the greatest utilization activity for this specific

carbohydrate, although the levels of utilization were not statistically significant at the 0.05 level. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9g. i-Erthritol. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9h. D-Fructose.. The microbial community of the ground water of the shallow aquifer, Dry Branch, demonstrated the greatest utilization activity for this specific carbohydrate, although the levels of utilization were not statistically significant at the 0.05 level. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9i. L-Fructose. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9j. D-Galactose. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carbohydrate. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9k. Gentiobiose. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9l. α -D-Glucose. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carbohydrate. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9m. m-Inositol. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9n. α -D-Lactose. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9o. Lactulose. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9p. Maltose. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9q. D-Mannitol. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9r. D-Mannose. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9s. D-Melibiose. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9t. β -Methyl D- Glucoside. The microbial community of the ground water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for this specific carbohydrate. The microorganisms in the Tobacco Road aquifer were significantly greater in their activity when compared to the PeeDee or Black Creek aquifers. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9u. D-Psicose. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9v. D-Raffinose. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9w. L-Rhamnose. Only the Black Creek and Congaree aquifers differ significantly in their ability to utilize this carbohydrate. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9x. D-Sorbitol. The microbial community of the ground water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for this specific carbohydrate. The microorganisms in the Tobacco Road aquifer were significantly greater in their activity when compared to the PeeDee or Black Creek

aquifers. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9y. Sucrose. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carbohydrate. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9z. D-Trehalose. The microbial community in the PeeDee and Dry Branch aquifers were significantly different in their activity for this specific carbohydrate. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9aa. Turanose. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 9bb. Xylitol. The microbial community of the ground water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for this specific carbohydrate. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

SUMMARY for CARBOHYDRATES

None of the 28 different carbohydrates employed in these two sampling periods demonstrated any consistent patterns of activity. The data indicate that the microorganisms in the shallower aquifers, Tobacco Road and Dry Branch, are the most activity in the utilization of these carbohydrates.

ESTER UTILIZATION. The ester group was composed of 2 different compounds. These compounds were utilized by the microbial consortia in the ground water from each of the major aquifers and are plotted as a composite with respect to *in situ* ester utilization as shown in Figure 10. Esters were utilized most efficiently in the Tobacco Road and Dry Branch aquifers. None of the other aquifers were distinguished from each other on the basis of their ester utilization.

Figure 10a. Mono-Methylsuccinate. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific ester. These two aquifers were significantly different from the Black Creek and the PeeDee aquifers. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 10b. Methyl Pyruvate. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific ester. These two aquifers were significantly different from the Black Creek and the PeeDee aquifers. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

SUMMARY for ESTERS

None of the esters employed in these two sampling periods demonstrated any consistent patterns of activity. The data indicate that the microorganisms in the shallower aquifers, Tobacco Road and Dry Branch, are the most activity in the utilization of these esters.

POLYMER UTILIZATION. The polymer group was composed of 5 different compounds. These compounds were utilized by the microbial consortia in the ground water from each of the major aquifers and are plotted as a composite with respect to *in situ* polymer utilization as shown in Figure 11. Polymers were utilized most efficiently in the Tobacco Road and Dry Branch aquifers. None of the other aquifers were distinguished from each other on the basis of their polymer utilization.

Figure 11a. Glycogen. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 11b. α -Cyclodextrin. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 11c. Dextrin. The microbial community of the shallow aquifer, Dry Branch, demonstrated the greatest utilization activity for this specific polymer. The microbial community in the PeeDee aquifer was significantly different from the Congaree, and Dry Branch aquifers. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 11d. Tween 80. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific polymer. These two aquifers were significantly different from the Congaree, Middendorf and the PeeDee aquifers. The microbial community from the Black Creek, Congaree, Middendorf and PeeDee aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 11e. Tween 40. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific polymer. The microbial community from the Black Creek, Congaree, Middendorf and PeeDee aquifers were not significantly different from each other when measured at the 0.05 confidence level.

SUMMARY for POLYMERS

None of the 5 different polymers employed in these two sampling periods demonstrated any consistent patterns of activity. The data indicate that the microorganisms in the shallower aquifers, Tobacco Road and Dry Branch, are the most activity in the utilization of these polymers.

CARBOXYLIC ACID UTILIZATION. The carboxylic acid group was composed of 24 different compounds. These compounds were utilized by the microbial consortia in the ground water from each of the major aquifers and are plotted as a composite with respect to *in situ* carboxylic acid utilization as shown in Figure 12. Carboxylic acids were utilized most efficiently in the two shallowest aquifers, Tobacco Road and Dry Branch. The microbial community of the PeeDee aquifer was significantly lower than any of the other tested aquifers. There was no difference observed in the microbial activity between the two deepest aquifers, Middendorf and Black Creek. The data indicate that the microbial community of the various aquifers differ with increasing depth.

Figure 12a. Acetic Acid. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 12b. *cis*-Aconitic Acid. The microbial community of the Dry Branch aquifer demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12c. Citric Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12d. Formic Acid. None of the aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 12e. D-Galactonic Acid Lactone. The microbial community of the ground water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for this specific carboxylic acid. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 12f. D-Galacturonic Acid. The microbial community of the ground water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for

this specific carboxylic acid. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 12g. D-Gluconic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12h. D-Glucosaminic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12i. D-Glucuronic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12j. α -Hydroxy Butyric Acid. The microbial community of the ground water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for this specific carboxylic acid. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 12k. β -Hydroxy Butyric Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12l. γ -Hydroxy Butyric Acid. The microbial community of the ground water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for this specific carboxylic acid. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 12m. p -Hydroxyphenylacetic Acid. None of the aquifers were significantly different from each other with respect to this carboxylic acid when measured at the 0.05 confidence level.

Figure 12n. Itaconic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12o. α -Ketobutyric Acid. The microbial community of the ground water of the shallow aquifer, Dry Branch, demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12p. α -Ketoglutaric Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12q. α -Ketovaleric Acid. The microbial community of the ground water of the shallow aquifer, Dry Branch, demonstrated the greatest utilization activity for this specific carboxylic acid. The Congaree and PeeDee aquifers differed statistically. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12r. D,L-Lactic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12s. Malonic Acid. The microbial community of the ground water of the Congaree demonstrated the greatest utilization activity for this specific carboxylic acid. The

remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12t. Propionic Acid. The microbial community of the ground water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for this specific carboxylic acid. None of the other aquifers were significantly different from each other when measured at the 0.05 confidence level.

Figure 12u. Quinic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12v. D-Saccharic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12w. Sebacic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 12x. Succinic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific carboxylic acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

SUMMARY for CARBOXYLIC ACID

The 24 different carboxylic acids employed in these two sampling periods demonstrated a consistent pattern of activity. The data indicate that the microorganisms in the shallower aquifers, Tobacco Road and Dry Branch, are the most active in the utilization of these carboxylic acids. The deeper aquifers are significantly different from the shallower aquifers in the ability of the *in situ* microbial community to use the selected carboxylic acids.

ALCOHOLS UTILIZATION. The group of alcohols was composed of 2 different compounds. These compounds were utilized by the microbial consortia in the ground water from each of the major aquifers and are plotted as a composite with respect to *in situ* alcohol utilization as shown in Figure 13. Alcohols were utilized most efficiently in the two shallowest aquifers, Tobacco Road and Dry Branch. The microbial community of the PeeDee aquifer was significantly lower than any of the other tested aquifers. There was no difference observed in the microbial activity between the two deepest aquifers, Middendorf and Black Creek. The data indicate that the microbial community of the various aquifers differ with increasing depth.

Figure 13a. 2,3-Butanediol. The microbial community of the ground water of the deeper aquifers, Middendorf and Black Creek, demonstrated the greatest utilization activity for this specific alcohol. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 13b. Glycerol. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific alcohol. The remaining deeper aquifers of Middendorf, Black Creek and PeeDee were significantly lower in their ability to utilize this specific alcohol.

AMIDES UTILIZATION. The group of amides was composed of 3 different compounds. These compounds were utilized by the microbial consortia in the ground water from each of the major aquifers and are plotted as a composite with respect to *in situ* amide utilization as shown in Figure 14. Amides were utilized most efficiently in the two shallowest aquifers, Tobacco Road and Dry Branch. The microbial community of the

PeeDee aquifer was significantly lower than any of the other tested aquifers. There was no difference observed in the microbial activity between the two deepest aquifers, Middendorf and Black Creek. The data indicate that the microbial community of the various aquifers differ with increasing depth with respect to utilization of amides.

Figure 14a. Succinamic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amide. This compound is utilized at the highest level for any of the compounds tested. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 14b. Glucuronamide. None of the aquifers were significantly different from each other with respect to this carboxylic acid when measured at the 0.05 confidence level.

Figure 14c. Alaninamide. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amide. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

PHOSPHORYLATED COMPOUND UTILIZATION. The group of phosphorylated compound was composed of 3 different compounds. These compounds were utilized by the microbial consortia in the ground water from each of the major aquifers and are plotted as a composite with respect to *in situ* amide utilization as shown in Figure 15. Phosphorylated compound were utilized most efficiently in the two shallowest aquifers, Tobacco Road and Dry Branch. The microbial community of the PeeDee aquifer was significantly lower than any of the other tested aquifers except the Black Creek aquifer. There was no difference observed in the microbial activity between the two deepest aquifers, Middendorf and Black Creek. The data indicate that the microbial community of the various aquifers differ with increasing depth with respect to utilization of phosphorylated compounds tested.

Figure 15a. D,L- α -Glycerol Phosphate. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific phosphorylated compound. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 15b. Glucose-1-Phosphate. The microbial community of the ground water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for this specific phosphorylated compound. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 15c. Glucose-6-Phosphate. None of the aquifers were significantly different from each other with respect to this carboxylic acid when measured at the 0.05 confidence level.

AMINO ACID UTILIZATION. The group of amino acid compounds was composed of 20 different compounds. These compounds were utilized by the microbial consortia in the ground water from each of the major aquifers and are plotted as a composite with respect to *in situ* amide utilization as shown in Figure 16. Amino acid compounds were utilized most efficiently in the two shallowest aquifers, Tobacco Road and Dry Branch. The microbial community of the PeeDee aquifer was significantly lower than any of the other tested aquifers. There was no difference observed in the microbial activity between the two deepest aquifers, Middendorf and Black Creek. The data indicate that the microbial community of the various aquifers differ with increasing depth with respect to utilization of amino acids tested.

Figure 16a. D-Alanine. None of the aquifers were significantly different from each other with respect to this amino acid when measured at the 0.05 confidence level.

Figure 16b. L-Alanine. The microbial community of the ground water of the shallow aquifer, Dry Branch, demonstrated the greatest utilization activity for this specific amino acid . The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16c. L-Alanyl Glycine. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid . The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16d. L-Asparagine. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid . The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16e. L-Aspartic Acid. The microbial community of the ground water of the three shallowest aquifers, Tobacco Road, Dry Branch and Congaree demonstrated the greatest utilization activity for this specific amino acid . The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16f. L-Glutamic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid . The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16g. Glycyl-L-Aspartic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid . The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16h. Glycyl-L-Glutamic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid . The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16i. L-Histidine. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid . The utilization of this amino acid by the microbial community in the PeeDee aquifer was significantly lower than the three shallowest aquifers, Tobacco Road, Dry Branch and Congaree. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16j. Hydroxy L-Proline. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid . The utilization of this amino acid by the microbial community in the PeeDee aquifer was significantly lower than the three shallowest aquifers, Tobacco Road, Dry Branch and Congaree. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16k. L-Leucine. The microbial community of the ground water of the two shallower aquifers, Dry Branch and Congaree demonstrated the greatest utilization activity for this specific amino acid . The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16l. L-Ornithine. The microbial community of the ground water of the two shallower aquifers, Dry Branch and Congaree demonstrated the greatest utilization activity for this specific amino acid . The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16m. L-Phenylalanine. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid . The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16n. L-Proline. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization

activity for this specific amino acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16o. L-Pyroglutamic. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid. The utilization of this amino acid by the microbial community in the PeeDee aquifer was significantly lower than the three shallowest aquifers, Tobacco Road, Dry Branch and Congaree. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16p. D-Serine. The microbial community of the ground water of the deepest aquifer, Middendorf, demonstrated the greatest utilization activity for this specific amino acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16q. L-Serine. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid. The utilization of this amino acid by the microbial community in the PeeDee aquifer was significantly lower than the three shallowest aquifers, Tobacco Road, Dry Branch and Congaree. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level. A clear difference in utilization between the D- and L- form of Serine is apparent from the data.

Figure 16r. L-Theonine. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16s. D, L-Carnitine. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific amino acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 16t. γ -Amino Butyric Acid. The microbial community in the ground water of the shallow aquifer, Dry Branch, demonstrated the greatest utilization activity for this specific amino acid. The utilization of this amino acid by the microbial community in the PeeDee aquifer was significantly lower than the shallow aquifers of Dry Branch and Congaree. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

AROMATIC CHEMICAL UTILIZATION. The group of aromatic chemical compounds was composed of 4 different compounds. These compounds were utilized by the microbial consortia in the ground water from each of the major aquifers and are plotted as a composite with respect to *in situ* aromatic utilization as shown in Figure 17. Aromatic compounds were utilized most efficiently in the two shallowest aquifers, Tobacco Road and Dry Branch. The microbial community of the PeeDee aquifer was significantly lower than any of the other tested aquifers. There was no difference observed in the microbial activity between the two deepest aquifers, Middendorf and Black Creek. The data indicate that the microbial community of the various aquifers differ with increasing depth with respect to utilization of aromatic compounds tested.

Figure 17a. Inosine. The microbial community of the ground water of the shallowest aquifer, Tobacco Road, demonstrated the greatest utilization activity for this specific aromatic compound. The utilization of this aromatic by the microbial community in the PeeDee aquifer was significantly lower than the shallow aquifer of the Congaree. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 17b. Urocanic Acid. The microbial community of the ground water of the two shallowest aquifers, Tobacco Road and Dry Branch demonstrated the greatest utilization activity for this specific aromatic compound. The utilization of this aromatic by

the microbial community in the PeeDee aquifer was significantly lower than the shallow aquifer of the Congaree or the deeper Black Creek aquifer. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 17c. Thymidine. None of the aquifers were significantly different from each other with respect to this aromatic compound when measured at the 0.05 confidence level.

Figure 17d. Uridine. None of the aquifers were significantly different from each other with respect to this aromatic compound when measured at the 0.05 confidence level.

BROMINATED CHEMICAL UTILIZATION. The group of brominated chemical compounds was composed of a single compound, Bromosuccinic Acid. This compound was utilized by the microbial consortia in the ground water from each of the major aquifers and are plotted as a composite with respect to *in situ* aromatic utilization as shown in Figure 18. Brominated compound was utilized most efficiently in the two shallowest aquifers, Tobacco Road and Dry Branch. There was no difference observed in the microbial activity between the two deepest aquifers, Middendorf and Black Creek.

AMINES UTILIZATION. The group of amine compounds was composed of 3 compounds. These compounds were utilized by the microbial consortia in the ground water from each of the major aquifers and are plotted as a composite with respect to *in situ* aromatic utilization as shown in Figure 19. Amine compounds were utilized most efficiently in the three shallowest aquifers, Tobacco, Road Dry Branch and Congaree. There was no difference observed in the microbial activity between the two deepest aquifers, Middendorf and Black Creek.

Figure 19a. Phenylethylamine. The microbial community of the ground water of the shallowest aquifer, Tobacco Road demonstrated the greatest utilization activity for this specific amine. None of the other aquifers were significantly different from each other with respect to this amine compound when measured at the 0.05 confidence level.

Figure 19b. 2-Amino Ethanol. The microbial community of the ground water of the three shallowest aquifers, Tobacco Road, Dry Branch and Congaree demonstrated the greatest utilization activity for this specific amino acid. The remaining aquifers were not significantly different from each other when measured at the 0.05 confidence level.

Figure 19c. Putrescine. None of the aquifers were significantly different from each other with respect to this amine compound when measured at the 0.05 confidence level.

DISCUSSION

The Biolog® data are very important in assessing the microbial activity of the subsurface community under *in situ* conditions. These data function in a variety of ways. It demonstrates that subsurface microbial populations are able to transform a number of different organic compounds with selected efficiencies. Such data can be utilized to establish baseline for microbial aquifer physiology. Thus if perturbations occur in the aquifer, such perturbations can be documented and the extent of recovery can be shown.

It is difficult to draw any overall conclusions from the sampling of each of these cluster wells only twice. There does appear that a trend exists whereby the shallower aquifers of Tobacco Road, Dry Branch and Congaree respond differently to almost all of the compounds tested when compared to the deeper aquifers of the Black Creek and Middendorf. The PeeDee aquifer appears to be a transition area for many of the compounds tested. Only one compound, D-Serine was more effectively utilized in the deeper aquifer than in the shallow ones.

The data from this sampling indicate that the bacterial activity, physiological ecology, and ecofunctional enzyme patterns can be assessed and quantified. The data indicate that

Biolog® data are useful in evaluating both the chemicals that can be used to stimulate the subsurface microbial consortia and to determine when the consortia has been returned to preperurbation conditions.

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TABLE 1. Physical and Chemical Data of the Sampled P Wells

Well ID	SRS North	SRS East	EffWell Depth (ft)	Temp (°C)	D.O. (ppm)	Cond. (µmh/sec)	pH	Redox (mv)
P-24 A	43142.2	66569.7	316.9	21.30	5.94	111	9.33	248.00
P-24 B	43127.8	66573.0	231.4	20.49	8.76	163	8.63	270.00
P-24 C	43112.8	66576.3	152.0	20.70	10.12	37	5.94	399.00
P-24 D	43098.5	66579.5	66.8	20.38	8.44	28	5.35	400.00
P-24TA	43096.2	66565.2	974.1	21.92	0.08	71	5.83	35.00
P-24TB	43110.4	66561.7	806.9	21.63	0.90	75	6.06	131.00
P-24TC	43125.3	66558.2	597.0	21.37	0.01	78	5.91	88.00
P-24TD	43139.3	66554.9	501.9	21.07	1.20	96	6.11	133.00
P-28 A	79275.2	55487.9	343.1	20.24	0.01	69	5.56	154
P-28TA	79284.3	55441.1	781.9	21.77	3.78	37	5.12	337
P-28TB	79288.9	55471.4	642.2	21.44	0.91	49	5.23	161
P-28TC	79291.1	55485.6	566.6	22.17	0.62	38	11.87	44
P-28TD	79293.5	55500.2	506.9	22.56	2.48	145	9.78	4
P-28 TE	79296.4	55514.8	416.8	20.79	0.05	73	5.9	128
P-29 A	86466.5	42751.6	316.7	20.73	0.05	64	6.1	106
P-29 B	86476.1	42763.7	191.5	20.74	10.06	66	5.52	409
P-29 C	86485.1	42775.4	142.3	19.51	5.42	40	5.05	378
P-29 D	86494.6	42787.2	114.8	20.82	7.96	41	4.96	434
P-29TA	86482.6	42796.2	692.3	20.89	5.47	30	5.31	299
P-29TC	86464.2	42773.0	512.0	20.99	3.74	50	5.92	225
P-29TD	86455.7	42761.5	431.8	20.61	1.45	47	5.33	185

TABLE 2. Sole carbon sources in Biolog[®] GN microtiter plates

<u>Carbohydrates</u>	<u>Carboxylic acids</u>	<u>Amino Acids</u>
N-Acetyl-D-galactosamine	Acetic acid	D-Alanine
N-Acetyl-D-glucosamine	<i>cis</i> -Aconitic acid	L-Alanine
Adonitol	Citric acid	L-Alanyl-glycine
L-Arabinose	Formic acid	L-Asparagine
D-Arabitol	D-Galactonic acid lactone	L-Aspartic acid
Cellobiose	D-Galacturonic acid	L-Glutamic acid
<i>i</i> -Erythritol	D-Gluconic acid	Glycyl-L-aspartic acid
D-Fructose	D-Glucosaminic acid	Glycyl-L-glutamic acid
L-Fucose	D-Glucuronic acid	L-Histidine
D-Galactose	α -Hydroxybutyric acid	Hydroxy-L-proline
Gentiobiose	β -Hydroxybutyric acid	L-Leucine
α -D-Glucose	γ -Hydroxybutyric acid	L-Ornithine
<i>m</i> -Inositol	<i>r</i> -Hydroxyphenylacetic acid	L-Phenylalanine
α -Lactose	Itaconic acid	L-Proline
Lactulose	α -Ketobutyric acid	L-Pyroglutamic acid
Maltose	α -Ketoglutaric acid	D-Serine
D-Mannitol	α -Ketovalenic acid	L-Serine
D-Mannose	D,L-Lactic acid	L-Threonine
D-Melibiose	Malonic acid	D,L-Carnitine
β -Methyl D-glucoside	Propionic acid	γ -Amino butyric acid
Psicose	Quinic acid	
D-Raffinose	D-Saccharic acid	<u>Aromatic chemicals</u>
L-Rhamnose	Sebacic acid	Inosine
D-Sorbitol	Succinic acid	Urocanic acid
Sucrose		Thymidine
D-Trehalose	<u>Alcohols</u>	Uridine
Turanose	2,3-Butanediol	
Xylitol	Glycerol	<u>Brominated chemicals</u>
<u>Esters</u>	<u>Amides</u>	Bromosuccinic acid
Mono-methylsuccinate	Succinamic acid	
Methylpyruvate	Glucuronamide	<u>Amines</u>
	Alaninamide	Phenyl ethylamine
<u>Polymers</u>	<u>Phosphorylated chemicals</u>	2-Aminoethanol
Glycogen	D,L- α -Glycerol phosphate	
α -Cyclodextrin	Glucose-1-phosphate	
Dextrin	Glucose-6-phosphate	
Tween 80		
Tween 40

Figure 1. Map of Savannah River Site and Well Clusters

FIGURE 2.
Depth (ft) By Aquifers

Means with confid. interval

Means

Summary of Fit

Rsquare 0.855714
Root Mean Square Error 105.7508
Mean of Response 383.44
Observations (or Sum Wgts) 70

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob>F
Model	6	4178425.1	696404	62.2722	
Error	63	704543.8	11183		
C Total	69	4882968.9			0.0000

Mean Estimates

Level	number	Mean	Std Error
Black Creek	9	451.833	35.250
Congaree	10	179.770	33.441
Dry Branch	12	124.125	30.528
McBean	3	231.400	61.055
Middendorf	21	710.857	23.077
Pee Dee	9	383.567	35.250
Tobacco Rd	6	68.800	43.173

Means Comparisons

Dif=Mean[i]-Mean[j]	Middendorf	Black Creek	Pee Dee	McBean	Congaree	Dry Branch	Tobacco Rd
Middendorf	0.000	259.024	327.290	479.457	531.087	586.732	642.057
Black Creek	-259.024	0.000	68.267	220.433	272.063	327.708	383.033
Pee Dee	-327.290	-68.267	0.000	152.167	203.797	259.442	314.767
McBean	-479.457	-220.433	-152.167	0.000	51.630	107.275	162.600
Congaree	-531.087	-272.063	-203.797	-51.630	0.000	55.645	110.970
Dry Branch	-586.732	-327.708	-259.442	-107.275	-55.645	0.000	55.325
Tobacco Rd	-642.057	-383.033	-314.767	-162.600	-110.970	-55.325	0.000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Middendorf	Black Creek	Pee Dee	McBean	Congaree	Dry Branch	Tobacco Rd
Middendorf	-65.217	174.829	243.096	349.024	449.893	510.259	544.232
Black Creek	174.829	-99.620	-31.354	79.549	174.966	234.522	271.655
Pee Dee	243.096	-31.354	-99.620	11.282	106.699	166.256	203.388
McBean	349.024	79.549	11.282	-172.547	-87.482	-29.136	13.170
Congaree	449.893	174.966	106.699	-87.482	-94.508	-34.840	1.842
Dry Branch	510.259	234.522	166.256	-29.136	-34.840	-86.274	-50.338
Tobacco Rd	544.232	271.655	203.388	13.170	1.842	-50.338	-122.009

Positive values show pairs of means that are significantly different.

FIGURE 3.

Temp °C By Aquifers

Means					
Summary of Fit					
Rsquare		0.397854			
Root Mean Square Error		0.577411			
Mean of Response		21.00343			
Observations (or Sum Wgts)		70			
Analysis of Variance					
Source	DF	Sum of Squares	Mean Square	F Ratio	
Model	6	13.878173	2.31303	6.9376	
Error	63	21.004404	0.33340	Prob>F	
C Total	69	34.882577		0.0000	
Mean Estimates					
Level	number	Mean	Std Error		
Black Creek	9	21.3200	0.19247		
Congaree	10	20.4240	0.18259		
Dry Branch	12	20.6050	0.16668		
McBean	3	20.4900	0.33337		
Middendorf	21	21.5443	0.12600		
Pee Dee	9	20.7167	0.19247		
Tobacco Rd	6	21.0850	0.23573		

Means Comparisons							
Dif=Mean[i]-Mean[j]	Middendorf	Black Creek	Tobacco Rd	Pee Dee	Dry Branch	McBean	Congaree
Middendorf	0.00000	0.22429	0.45929	0.82762	0.93929	1.05429	1.12029
Black Creek	-0.22429	0.00000	0.23500	0.60333	0.71500	0.83000	0.89600
Tobacco Rd	-0.45929	-0.23500	0.00000	0.36833	0.48000	0.59500	0.66100
Pee Dee	-0.82762	-0.60333	-0.36833	0.00000	0.11167	0.22667	0.29267
Dry Branch	-0.93929	-0.71500	-0.48000	-0.11167	0.00000	0.11500	0.18100
McBean	-1.05429	-0.83000	-0.59500	-0.22667	-0.11500	0.00000	0.06600
Congaree	-1.12029	-0.89600	-0.66100	-0.29267	-0.18100	-0.06600	0.00000
Alpha= 0.05							
Comparisons for each pair using Student's t							
t	1.99834						
Abs(Dif)-LSD	Middendorf	Black Creek	Tobacco Rd	Pee Dee	Dry Branch	McBean	Congaree
Middendorf	-0.35609	-0.23542	-0.07485	0.367908	0.521733	0.342105	0.676957
Black Creek	-0.23542	-0.54394	-0.37314	0.059396	0.206194	0.060757	0.365836
Tobacco Rd	-0.07485	-0.37314	-0.66618	-0.23981	-0.09693	-0.22091	0.065147
Pee Dee	0.367908	0.059396	-0.23981	-0.54394	-0.39714	-0.54258	-0.2375
Dry Branch	0.521733	0.206194	-0.09693	-0.39714	-0.47106	-0.62982	-0.31306
McBean	0.342105	0.060757	-0.22091	-0.54258	-0.62982	-0.94213	-0.69357
Congaree	0.676957	0.365836	0.065147	-0.2375	-0.31306	-0.69357	-0.51602
Positive values show pairs of means that are significantly different.							

FIGURE 4.
D.O. (ppm) By Aquifers

Means with confid. interval

Means

Summary of Fit

Rsquare 0.846972
 Root Mean Square Error 1.491123
 Mean of Response 4.401857
 Observations (or Sum Wgts) 70

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	6	775.29104	129.215	58.1148
Error	63	140.07721	2.223	Prob>F
C Total	69	915.36826		0.0000

Mean Estimates

Level	number	Mean	Std Error
Blck Creek	9	1.32667	0.49704
Congaree	10	7.56000	0.47153
Dry Branch	12	8.34500	0.43045
McBean	3	8.76000	0.86090
Middendorf	21	2.21429	0.32539
Pee Dee	9	0.02333	0.49704
Tobacco Rd	6	7.91000	0.60875

Means Comparisons

Dif=Mean[i]-Mean[j]	McBean	Dry Branch	Tobacco Rd	Congaree	Middendorf	Blck Creek	Pee Dee
McBean	0.00000	0.41500	0.85000	1.20000	6.54571	7.43333	8.73667
Dry Branch	-0.41500	0.00000	0.43500	0.78500	6.13071	7.01833	8.32167
Tobacco Rd	-0.85000	-0.43500	0.00000	0.35000	5.69571	6.58333	7.88667
Congaree	-1.20000	-0.78500	-0.35000	0.00000	5.34571	6.23333	7.53667
Middendorf	-6.54571	-6.13071	-5.69571	-5.34571	0.00000	0.88762	2.19095
Blck Creek	-7.43333	-7.01833	-6.58333	-6.23333	-0.88762	0.00000	1.30333
Pee Dee	-8.73667	-8.32167	-7.88667	-7.53667	-2.19095	-1.30333	0.00000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	McBean	Dry Branch	Tobacco Rd	Congaree	Middendorf	Blck Creek	Pee Dee
McBean	-2.43298	-1.50844	-1.25702	-0.76153	4.70656	5.44682	6.75015
Dry Branch	-1.50844	-1.21649	-1.05489	-0.49086	5.05241	5.70438	7.00771
Tobacco Rd	-1.25702	-1.05489	-1.72037	-1.18875	4.31635	5.01285	6.31619
Congaree	-0.76153	-0.49086	-1.18875	-1.33260	4.20085	4.86422	6.16755
Middendorf	4.70656	5.05241	4.31635	4.20085	-0.91958	-0.29955	1.00378
Blck Creek	5.44682	5.70438	5.01285	4.86422	-0.29955	-1.40468	-0.10135
Pee Dee	6.75015	7.00771	6.31619	6.16755	1.00378	-0.10135	-1.40468

Positive values show pairs of means that are significantly different.

FIGURE 5.
Conductivity By Aquifers

Means

Summary of Fit	
Rsquare	0.096709
Root Mean Square Error	757.4831
Mean of Response	229.7571
Observations (or Sum Wgts)	70

Analysis of Variance				
Source	DF	Sum of Squares	Mean Square	F Ratio
Model	6	3870153	645025	1.1242
Error	63	36148182	573781	Prob>F
C Total	69	40018335		0.3587

Mean Estimates			
Level	number	Mean	Std Error
Blck Creek	9	88.333	252.49
Congaree	10	80.700	239.54
Dry Branch	12	55.000	218.67
McBean	3	163.000	437.33
Middendorf	21	587.286	165.30
Pee Dee	9	80.667	252.49
Tobacco Rd	6	45.500	309.24

Means Comparisons

Dif=Mean[i]-Mean[j]	Middendorf	McBean	Blck Creek	Congaree	Pee Dee	Dry Branch	Tobacco Rd
Middendorf	0.000	424.286	498.952	506.586	506.619	532.286	541.786
McBean	-424.286	0.000	74.667	82.300	82.333	108.000	117.500
Blck Creek	-498.952	-74.667	0.000	7.633	7.667	33.333	42.833
Congaree	-506.586	-82.300	-7.633	0.000	0.033	25.700	35.200
Pee Dee	-506.619	-82.333	-7.667	-0.033	0.000	25.667	35.167
Dry Branch	-532.286	-108.000	-33.333	-25.700	-25.667	0.000	9.500
Tobacco Rd	-541.786	-117.500	-42.833	-35.200	-35.167	-9.500	0.000

Alpha= 0.05

Comparisons for each pair using Student's t

t							
1.99834							
Abs(Dif)-LSD	Middendorf	McBean	Blck Creek	Congaree	Pee Dee	Dry Branch	Tobacco Rd
Middendorf	-467.14	-510.00	-104.12	-75.00	-96.46	-15.49	-158.93
McBean	-510.00	-1235.94	-934.47	-914.15	-926.81	-869.10	-952.85
Blck Creek	-104.12	-934.47	-713.57	-687.87	-705.90	-634.15	-754.96
Congaree	-75.00	-914.15	-687.87	-676.95	-695.47	-622.43	-746.48
Pee Dee	-96.46	-926.81	-705.90	-695.47	-713.57	-641.82	-762.63
Dry Branch	-15.49	-869.10	-634.15	-622.43	-641.82	-617.97	-747.36
Tobacco Rd	-158.93	-952.85	-754.96	-746.48	-762.63	-747.36	-873.94

Positive values show pairs of means that are significantly different.

FIGURE 6.

pH By Aquifers

Means

Summary of Fit

Rsquare	0.185238
Root Mean Square Error	1.599741
Mean of Response	6.251143
Observations (or Sum Wgts)	70

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	6	36.65548	6.10925	2.3872
Error	63	161.22783	2.55917	Prob>F
C Total	69	197.88331		0.0384

Mean Estimates

Level	number	Mean	Std Error
Black Creek	9	7.00333	0.53325
Congaree	10	6.10500	0.50588
Dry Branch	12	5.52000	0.46181
McBean	3	8.63000	0.92361
Middendorf	21	6.47714	0.34909
Pee Dee	9	6.00000	0.53325
Tobacco Rd	6	5.22500	0.65309

Means Comparisons

Dif=Mean[i]-Mean[j]	McBean	Black Creek	Middendorf	Congaree	Pee Dee	Dry Branch	Tobacco Rd
McBean	0.00000	1.62667	2.15286	2.52500	2.63000	3.11000	3.40500
Black Creek	-1.62667	0.00000	0.52619	0.89833	1.00333	1.48333	1.77833
Middendorf	-2.15286	-0.52619	0.00000	0.37214	0.47714	0.95714	1.25214
Congaree	-2.52500	-0.89833	-0.37214	0.00000	0.10500	0.58500	0.88000
Pee Dee	-2.63000	-1.00333	-0.47714	-0.10500	0.00000	0.48000	0.77500
Dry Branch	-3.11000	-1.48333	-0.95714	-0.58500	-0.48000	0.00000	0.29500
Tobacco Rd	-3.40500	-1.77833	-1.25214	-0.88000	-0.77500	-0.29500	0.00000

Alpha= 0.05

Comparisons for each pair using Student's t

	McBean	Black Creek	Middendorf	Congaree	Pee Dee	Dry Branch	Tobacco Rd
1.99834							
Abs(Dif)-LSD							
McBean	-2.61020	-0.50455	0.17973	0.42059	0.49878	1.04645	1.14450
Black Creek	-0.50455	-1.50700	-0.74746	-0.57051	-0.50367	0.07366	0.09346
Middendorf	0.17973	-0.74746	-0.98656	-0.85612	-0.79650	-0.19971	-0.22770
Congaree	0.42059	-0.57051	-0.85612	-1.42967	-1.36384	-0.78380	-0.77084
Pee Dee	0.49878	-0.50367	-0.79650	-1.36384	-1.50700	-0.92967	-0.90988
Dry Branch	1.04645	0.07366	-0.19971	-0.78380	-0.92967	-1.30510	-1.30342
Tobacco Rd	1.14450	0.09346	-0.22770	-0.77084	-0.90988	-1.30342	-1.84569

Positive values show pairs of means that are significantly different.

FIGURE 7.
Redox By Aquifers

Means with confid. interval

Means

Summary of Fit

Rsquare

0.663314

Root Mean Square Error

85.9409

Mean of Response

235.4857

Observations (or Sum Wgts)

70

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	6	916713.7	152786	20.6863
Error	63	465307.8	7386	Prob>F
C Total	69	1382021.5		0.0000

Mean Estimates

Level	number	Mean	Std Error
Blck Creek	9	105.667	28.647
Congaree	10	340.400	27.177
Dry Branch	12	390.250	24.809
McBean	3	270.000	49.618
Middendorf	21	163.429	18.754
Pee Dee	9	108.667	28.647
Tobacco Rd	6	371.000	35.085

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Tobacco Rd	Congaree	McBean	Middendorf	Pee Dee	Blck Creek
Dry Branch	0.000	19.250	49.850	120.250	226.821	281.583	284.583
Tobacco Rd	-19.250	0.000	30.600	101.000	207.571	262.333	265.333
Congaree	-49.850	-30.600	0.000	70.400	176.971	231.733	234.733
McBean	-120.250	-101.000	-70.400	0.000	106.571	161.333	164.333
Middendorf	-226.821	-207.571	-176.971	-106.571	0.000	54.762	57.762
Pee Dee	-281.583	-262.333	-231.733	-161.333	-54.762	0.000	3.000
Blck Creek	-284.583	-265.333	-234.733	-164.333	-57.762	-3.000	0.000

Alpha= 0.05

Comparisons for each pair using Student's t

t

1.99834

Abs(Dif)-LSD	Dry Branch	Tobacco Rd	Congaree	McBean	Middendorf	Pee Dee	Blck Creek
Dry Branch	-70.112	-66.620	-23.684	9.393	164.674	205.853	208.853
Tobacco Rd	-66.620	-99.154	-58.086	-20.438	128.072	171.819	174.819
Congaree	-23.684	-58.086	-76.804	-42.653	110.987	152.825	155.825
McBean	9.393	-20.438	-42.653	-140.225	0.572	46.840	49.840
Middendorf	164.674	128.072	110.987	0.572	-53.000	-13.661	-10.661
Pee Dee	205.853	171.819	152.825	46.840	-13.661	-80.959	-77.959
Blck Creek	208.853	174.819	155.825	49.840	-10.661	-77.959	-80.959

Positive values show pairs of means that are significantly different.

FIGURE 8.

FITC Cts/ml By Aquifers

Means

Summary of Fit

Rsquare 0.294411
 Root Mean Square Error 10317651
 Mean of Response 2962529
 Observations (or Sum Wgts) 69

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	6	2.75e+15	5e+14	4.3116
Error	62	6.6e+15	1e+14	Prob>F
C Total	68	9.35e+15		0.0011

Mean Estimates

Level	number	Mean	Std Error
Blck Creek	9	227166.7	3439217
Congaree	9	257000	3439217
Dry Branch	12	240750	2978449
McBean	3	194000	5956899
Middendorf	21	866095.2	2251496
Pee Dee	9	19257333	3439217
Tobacco Rd	6	847000	4212163

Means Comparisons

Dif=Mean(i)-Mean(j)	Pee Dee	Middendorf	Tobacco Rd	Congaree	Dry Branch	Blck Creek	McBean
Pee Dee	0	18391238	18410333	19000333	19016583	19030167	19063333
Middendorf	-2e+7	0	19095.24	609095.2	625345.2	638928.6	672095.2
Tobacco Rd	-2e+7	-19095.2	0	590000	606250	619833.3	653000
Congaree	-2e+7	-6e+5	-590000	0	16250	29833.33	63000
Dry Branch	-2e+7	-6e+5	-606250	-16250	0	13583.33	46750
Blck Creek	-2e+7	-6e+5	-6e+5	-29833.3	-13583.3	0	33166.67
McBean	-2e+7	-7e+5	-653000	-63000	-46750	-33166.7	0

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Pee Dee	Middendorf	Tobacco Rd	Congaree	Dry Branch	Blck Creek	McBean
Pee Dee	-9722579	10174159	7540160	9277754	9921944	9307588	5313530
Middendorf	10174159	-6364922	-9528288	-7607984	-6838187	-7578150	-1e+7
Tobacco Rd	7540160	-9528288	-1e+7	-1e+7	-9706102	-1e+7	-1e+7
Congaree	9277754	-7607984	-1e+7	-9722579	-9078390	-9692746	-1e+7
Dry Branch	9921944	-6838187	-9706102	-9078390	-8420000	-9081056	-1e+7
Blck Creek	9307588	-7578150	-1e+7	-9692746	-9081056	-9722579	-1e+7
McBean	5313530	-1e+7	-1e+7	-1e+7	-1e+7	-1e+7	-2e+7

Positive values show pairs of means that are significantly different.

FIGURE 9.

Oneway Anova

Summary of Fit

RSquare	0.077045
RSquare Adj	0.075209
Root Mean Square Error	0.671515
Mean of Response	0.643209
Observations (or Sum Wgts)	2519

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	94.5957	18.9191	41.9555
Error	2513	1133.1942	0.4509	Prob>F
C Total	2518	1227.7899		0.0000

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	392	0.529033	0.03392
Congaree	419	0.693881	0.03281
Dry Branch	420	0.912086	0.03277
McBean	0	.	.
Middendorf	672	0.567479	0.02590
Pee Dee	364	0.339445	0.03520
Tobacco Rd	252	0.929155	0.04230

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.218205	0.383053	.	-0.01707	0.344607	0.572641
Congaree	-0.21821	0.000000	0.164848	.	-0.23527	0.126402	0.354436
Blck Creek	-0.38305	-0.16485	0.000000	.	-0.40012	-0.03845	0.189588
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.017069	0.235274	0.400122	.	0.000000	0.361676	0.589710
Middendorf	-0.34461	-0.1264	0.038446	.	-0.36168	0.000000	0.228034
Pee Dee	-0.57264	-0.35444	-0.18959	.	-0.58971	-0.22803	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.09087	0.127283	0.290576	.	-0.08786	0.262699	0.478342
Congaree	0.127283	-0.09098	0.072318	.	0.130302	0.044434	0.260085
Blck Creek	0.290576	0.072318	-0.09406	.	0.293800	-0.04524	0.093739
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.08786	0.130302	0.293800	.	-0.11731	0.264407	0.481800
Middendorf	0.262699	0.044434	-0.04524	.	0.264407	-0.07184	0.142337
Pee Dee	0.478342	0.260085	0.093739	.	0.481800	0.142337	-0.09761

Positive values show pairs of means that are significantly different.

FIGURE 9a.

N-acetyl-D-galactosamine By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.292128
RSquare Adj	0.249993
Root Mean Square Error	0.479891
Mean of Response	0.553867
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	7.983328	1.59667	6.9331
Error	84	19.344836	0.23030	Prob>F
C Total	89	27.328164		0.0000

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.38971	0.12826
Congaree	15	0.56053	0.12391
Dry Branch	15	0.73020	0.12391
McBean	0	.	.
Middendorf	24	0.39887	0.09796
Pee Dee	13	0.26538	0.13310
Tobacco Rd	9	1.33422	0.15996

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.00000	0.16967	0.34049	.	-0.60402	0.33133	0.46482
Congaree	-0.16967	0.00000	0.17082	.	-0.77369	0.16166	0.29515
Black Creek	-0.34049	-0.17082	0.00000	.	-0.94451	-0.00916	0.12433
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.60402	0.77369	0.94451	.	0.00000	0.93535	1.06884
Middendorf	-0.33133	-0.16166	0.00916	.	-0.93535	0.00000	0.13349
Pee Dee	-0.46482	-0.29515	-0.12433	.	-1.06884	-0.13349	0.00000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.34847	-0.1788	-0.01415	.	0.201645	0.017220	0.103192
Congaree	-0.1788	-0.34847	-0.18382	.	0.371312	-0.15245	-0.06647
Black Creek	-0.01415	-0.18382	-0.3607	.	0.536778	-0.31177	-0.24324
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.201645	0.371312	0.536778	.	-0.44987	0.562334	0.655016
Middendorf	0.017220	-0.15245	-0.31177	.	0.562334	-0.27549	-0.19515
Pee Dee	0.103192	-0.06647	-0.24324	.	0.655016	-0.19515	-0.37432

Positive values show pairs of means that are significantly different.

FIGURE 9b.

Oneway Anova

Summary of Fit

RSquare	0.134082
RSquare Adj	0.082539
Root Mean Square Error	0.670603
Mean of Response	0.722111
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5.849290	1.16986	2.6014
Error	84	37.775513	0.44971	Prob>F
C Total	89	43.624803		0.0308

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.64907	0.17923
Congaree	15	0.67467	0.17315
Dry Branch	15	1.24893	0.17315
McBean	0	.	.
Middendorf	24	0.62138	0.13689
Pee Dee	13	0.40377	0.18599
Tobacco Rd	9	0.76522	0.22353

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.574267	0.599862	.	0.483711	0.627558	0.845164
Congaree	-0.57427	0.000000	0.025595	.	-0.09056	0.053292	0.270897
Black Creek	-0.59986	-0.0256	0.000000	.	-0.11615	0.027696	0.245302
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.48371	0.090556	0.116151	.	0.000000	0.143847	0.361453
Middendorf	-0.62756	-0.05329	-0.0277	.	-0.14385	0.000000	0.217606
Pee Dee	-0.84516	-0.2709	-0.2453	.	-0.36145	-0.21761	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.48695	0.087315	0.104290	.	-0.07857	0.188626	0.339830
Congaree	0.087315	-0.48695	-0.46998	.	-0.47173	-0.38564	-0.23444
Black Creek	0.104290	-0.46998	-0.50404	.	-0.45361	-0.42078	-0.26834
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.07857	-0.47173	-0.45361	.	-0.62865	-0.3774	-0.21682
Middendorf	0.188626	-0.38564	-0.42078	.	-0.3774	-0.38497	-0.24164
Pee Dee	0.339830	-0.23444	-0.26834	.	-0.21682	-0.24164	-0.52307

Positive values show pairs of means that are significantly different.

FIGURE 9c.

adonitol By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.100207
RSquare Adj	0.046648
Root Mean Square Error	0.668773
Mean of Response	0.560378
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4.184014	0.836803	1.8710
Error	84	37.569571	0.447257	Prob>F
C Total	89	41.753585		0.1080

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.41550	0.17874
Congaree	15	0.45613	0.17268
Dry Branch	15	0.76613	0.17268
McBean	0	.	.
Middendorf	24	0.51112	0.13651
Pee Dee	13	0.33477	0.18548
Tobacco Rd	9	1.07378	0.22292

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Middendorf	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	0.000000	0.255008	0.350633	.	-0.30764	0.310000	0.431364
Middendorf	-0.25501	0.000000	0.095625	.	-0.56265	0.054992	0.176356
Black Creek	-0.35063	-0.09563	0.000000	.	-0.65828	-0.04063	0.080731
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.307644	0.562653	0.658278	.	0.000000	0.617644	0.739009
Congaree	-0.31	-0.05499	0.040633	.	-0.61764	0.000000	0.121364
Pee Dee	-0.43136	-0.17636	-0.08073	.	-0.73901	-0.12136	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Middendorf	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	-0.48562	-0.18273	-0.14359	.	-0.2531	-0.17562	-0.07259
Middendorf	-0.18273	-0.38392	-0.35163	.	0.042824	-0.38274	-0.28163
Black Creek	-0.14359	-0.35163	-0.50267	.	0.090068	-0.45359	-0.43151
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.2531	0.042824	0.090068	.	-0.62694	0.056895	0.162311
Congaree	-0.17562	-0.38274	-0.45359	.	0.056895	-0.48562	-0.38259
Pee Dee	-0.07259	-0.28163	-0.43151	.	0.162311	-0.38259	-0.52164

Positive values show pairs of means that are significantly different.

FIGURE 9d.

L-arabinose By Aquifers

Oneway Anova

Summary of Fit

RSquare 0.152488
 RSquare Adj 0.102041
 Root Mean Square Error 0.71601
 Mean of Response 0.776767
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob>F
Model	5	7.748296	1.54966	3.0227	
Error	84	43.064306	0.51267		
C Total	89	50.812602			0.0147

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.74571	0.19136
Congaree	15	0.83340	0.18487
Dry Branch	15	0.91713	0.18487
McBean	0	.	.
Middendorf	24	0.54512	0.14615
Pee Dee	13	0.49200	0.19859
Tobacco Rd	9	1.52578	0.23867

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.00000	0.08373	0.17142	.	-0.60864	0.37201	0.42513
Congaree	-0.08373	0.00000	0.08769	.	-0.69238	0.28828	0.34140
Black Creek	-0.17142	-0.08769	0.00000	.	-0.78006	0.20059	0.25371
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.60864	0.69238	0.78006	.	0.00000	0.98065	1.03378
Middendorf	-0.37201	-0.28828	-0.20059	.	-0.98065	0.00000	0.05312
Pee Dee	-0.42513	-0.34140	-0.25371	.	-1.03378	-0.05312	0.00000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.51992	-0.43619	-0.35771	.	0.008288	-0.09664	-0.11442
Congaree	-0.43619	-0.51992	-0.44144	.	0.092021	-0.18038	-0.19815
Black Creek	-0.35771	-0.44144	-0.53817	.	0.171720	-0.27825	-0.29471
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.008288	0.092021	0.171720	.	-0.67122	0.424107	0.416346
Middendorf	-0.09664	-0.18038	-0.27825	.	0.424107	-0.41104	-0.43721
Pee Dee	-0.11442	-0.19815	-0.29471	.	0.416346	-0.43721	-0.55849

Positive values show pairs of means that are significantly different.

FIGURE 9e.

Oneway Anova

Summary of Fit

RSquare	0.195617
RSquare Adj	0.147737
Root Mean Square Error	0.699068
Mean of Response	0.771056
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	9.982986	1.99660	4.0856
Error	84	41.050415	0.48870	Prob>F
C Total	89	51.033401		0.0023

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.49829	0.18683
Congaree	15	0.91300	0.18050
Dry Branch	15	1.27633	0.18050
McBean	0	.	.
Middendorf	24	0.65704	0.14270
Pee Dee	13	0.27092	0.19389
Tobacco Rd	9	1.14311	0.23302

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.00000	0.36333	0.77805	.	0.13322	0.61929	1.00541
Congaree	-0.36333	0.00000	0.41471	.	-0.23011	0.25596	0.64208
Black Creek	-0.77805	-0.41471	0.00000	.	-0.64483	-0.15876	0.22736
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.13322	0.23011	0.64483	.	0.00000	0.48607	0.87219
Middendorf	-0.61929	-0.25596	0.15876	.	-0.48607	0.00000	0.38612
Pee Dee	-1.00541	-0.64208	-0.22736	.	-0.87219	-0.38612	0.00000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.50762	-0.14429	0.261441	.	-0.45293	0.161728	0.478627
Congaree	-0.14429	-0.50762	-0.10189	.	-0.35604	-0.20161	0.115293
Black Creek	0.261441	-0.10189	-0.52544	.	0.050876	-0.30876	-0.30808
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.45293	-0.35604	0.050876	.	-0.65534	-0.05731	0.269366
Middendorf	0.161728	-0.20161	-0.30876	.	-0.05731	-0.40131	-0.09262
Pee Dee	0.478627	0.115293	-0.30808	.	0.269366	-0.09262	-0.54527

Positive values show pairs of means that are significantly different.

FIGURE 9f.

cellobiose By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.114914
RSquare Adj	0.06223
Root Mean Square Error	0.610247
Mean of Response	0.581833
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4.061402	0.812280	2.1812
Error	84	31.281715	0.372401	Prob>F
C Total	89	35.343116		0.0638

Means for Oneway Anova

Level	Number	Mean	Std. Error
Black Creek	14	0.61529	0.16310
Congaree	15	0.58853	0.15757
Dry Branch	15	1.00393	0.15757
McBean	0	.	.
Middendorf	24	0.46808	0.12457
Pee Dee	13	0.29985	0.16925
Tobacco Rd	9	0.52578	0.20342

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.388648	0.415400	.	0.478156	0.535850	0.704087
Black Creek	-0.38865	0.000000	0.026752	.	0.089508	0.147202	0.315440
Congaree	-0.4154	-0.02675	0.000000	.	0.062756	0.120450	0.288687
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.47816	-0.08951	-0.06276	.	0.000000	0.057694	0.225932
Middendorf	-0.53585	-0.1472	-0.12045	.	-0.05769	0.000000	0.168237
Pee Dee	-0.70409	-0.31544	-0.28869	.	-0.22593	-0.16824	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

		Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Abs(Dif)-LSD	1.98862							
Dry Branch		-0.44313	-0.06232	-0.02773	.	-0.03352	0.136422	0.244235
Black Creek		-0.06232	-0.45868	-0.42422	.	-0.42898	-0.26091	-0.15198
Congaree		-0.02773	-0.42422	-0.44313	.	-0.44892	-0.27898	-0.17117
McBean		.	.	.	.	.	.	.
Tobacco Rd		-0.03352	-0.42898	-0.44892	.	-0.57207	-0.41664	-0.3003
Middendorf		0.136422	-0.26091	-0.27898	.	-0.41664	-0.35032	-0.24967
Pee Dee		0.244235	-0.15198	-0.17117	.	-0.3003	-0.24967	-0.47599

Positive values show pairs of means that are significantly different.

FIGURE 9g.

Oneway Anova

Summary of Fit

RSquare	0.031503
RSquare Adj	-0.02615
Root Mean Square Error	0.473282
Mean of Response	0.3805
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.612026	0.122405	0.5465
Error	84	18.815686	0.223996	Prob>F
C Total	89	19.427713		0.7406

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.309357	0.12649
Congaree	15	0.527467	0.12220
Dry Branch	15	0.312667	0.12220
McBean	0	.	.
Middendorf	24	0.418792	0.09661
Pee Dee	13	0.372385	0.13126
Tobacco Rd	9	0.268889	0.15776

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]

	Congaree	Pee Dee	Black Creek	McBean	Middendorf	Dry Branch	Tobacco Rd
Congaree	0.000000	0.155082	0.218110	.	0.108675	0.214800	0.258578
Pee Dee	-0.15508	0.000000	0.063027	.	-0.04641	0.059718	0.103496
Black Creek	-0.21811	-0.06303	0.000000	.	-0.10943	-0.00331	0.040468
McBean	.	.	.	.	.	.	.
Middendorf	-0.10868	0.046407	0.109435	.	0.000000	0.106125	0.149903
Dry Branch	-0.2148	-0.05972	0.003310	.	-0.10612	0.000000	0.043778
Tobacco Rd	-0.25858	-0.1035	-0.04047	.	-0.1499	-0.04378	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

t

1.98862

Abs(Dif)-LSD

	Congaree	Pee Dee	Black Creek	McBean	Middendorf	Dry Branch	Tobacco Rd
Congaree	-0.34367	-0.20156	-0.13164	.	-0.2011	-0.12887	-0.13826
Pee Dee	-0.20156	-0.36916	-0.29948	.	-0.27771	-0.29692	-0.30463
Black Creek	-0.13164	-0.29948	-0.35573	.	-0.20708	-0.34644	-0.36165
McBean	.	.	.	.	.	.	.
Middendorf	-0.2011	-0.27771	-0.20708	.	-0.27169	-0.20365	-0.21797
Dry Branch	-0.12887	-0.29692	-0.34644	.	-0.20365	-0.34367	-0.35306
Tobacco Rd	-0.13826	-0.30463	-0.36165	.	-0.21797	-0.35306	-0.44368

Positive values show pairs of means that are significantly different.

FIGURE 9h.

Oneway Anova**Summary of Fit**

RSquare 0.172523
 RSquare Adj 0.122675
 Root Mean Square Error 0.908315
 Mean of Response 1.009225
 Observations (or Sum Wgts) 89

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	14.277142	2.85543	3.4610
Error	83	68.477971	0.82504	Prob>F
C Total	88	82.755114		0.0069

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.96250	0.24276
Congaree	14	0.82200	0.24276
Dry Branch	15	1.85187	0.23453
McBean	0	.	.
Middendorf	24	0.94733	0.18541
Pee Dee	13	0.57346	0.25192
Tobacco Rd	9	0.76322	0.30277

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Black Creek	Middendorf	McBean	Congaree	Tobacco Rd	Pee Dee
Dry Branch	0.00000	0.88937	0.90453	.	1.02987	1.08864	1.27841
Black Creek	-0.88937	0.00000	0.01517	.	0.14050	0.19928	0.38904
Middendorf	-0.90453	-0.01517	0.00000	.	0.12533	0.18411	0.37387
McBean	.	.	.	.	.	.	.
Congaree	-1.02987	-0.14050	-0.12533	.	0.00000	0.05878	0.24854
Tobacco Rd	-1.08864	-0.19928	-0.18411	.	-0.05878	0.00000	0.18976
Pee Dee	-1.27841	-0.38904	-0.37387	.	-0.24854	-0.18976	0.00000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Black Creek	Middendorf	McBean	Congaree	Tobacco Rd	Pee Dee
Dry Branch	-0.65968	0.218010	0.309906	.	0.358510	0.326911	0.593823
Black Creek	0.218010	-0.68283	-0.59239	.	-0.54233	-0.57259	-0.3068
Middendorf	0.309906	-0.59239	-0.52152	.	-0.48222	-0.52203	-0.24827
McBean	.	.	.	.	.	.	.
Congaree	0.358510	-0.54233	-0.48222	.	-0.68283	-0.71309	-0.4473
Tobacco Rd	0.326911	-0.57259	-0.52203	.	-0.71309	-0.85164	-0.59364
Pee Dee	0.593823	-0.3068	-0.24827	.	-0.4473	-0.59364	-0.70861

Positive values show pairs of means that are significantly different.

FIGURE 9i.

L-fructose By Aquifers

Oneway Anova

Summary of Fit

RSquare 0.155067
 RSquare Adj 0.104773
 Root Mean Square Error 0.689954
 Mean of Response 0.665944
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	7.338624	1.46772	3.0832
Error	84	39.987027	0.47604	Prob>F
C Total	89	47.325651		0.0133

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.70036	0.18440
Congaree	15	0.80513	0.17815
Dry Branch	15	0.92227	0.17815
McBean	0	.	.
Middendorf	24	0.43358	0.14084
Pee Dee	13	0.24254	0.19136
Tobacco Rd	9	1.18444	0.22998

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.117133	0.221910	.	-0.26218	0.488683	0.679728
Congaree	-0.11713	0.000000	0.104776	.	-0.37931	0.371550	0.562595
Black Creek	-0.22191	-0.10478	0.000000	.	-0.48409	0.266774	0.457819
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.262178	0.379311	0.484087	.	0.000000	0.750861	0.941906
Middendorf	-0.48868	-0.37155	-0.26677	.	-0.75086	0.000000	0.191045
Pee Dee	-0.67973	-0.56259	-0.45782	.	-0.94191	-0.19104	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.501	-0.38387	-0.28796	.	-0.31633	0.037085	0.159812
Congaree	-0.38387	-0.501	-0.4051	.	-0.1992	-0.08005	0.042679
Black Creek	-0.28796	-0.4051	-0.51859	.	-0.10212	-0.19464	-0.07065
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.31633	-0.1992	-0.10212	.	-0.64679	0.214569	0.346943
Middendorf	0.037085	-0.08005	-0.19464	.	0.214569	-0.39608	-0.28145
Pee Dee	0.159812	0.042679	-0.07065	.	0.346943	-0.28145	-0.53816

Positive values show pairs of means that are significantly different.

FIGURE 9j.

D-galactose By Aquifers **Oneway Anova****Summary of Fit**

RSquare	0.211686
RSquare Adj	0.164762
Root Mean Square Error	0.65998
Mean of Response	0.666689
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	9.825018	1.96500	4.5113
Error	84	36.588214	0.43557	Prob>F
C Total	89	46.413231		0.0011

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.60864	0.17639
Congaree	15	0.50187	0.17041
Dry Branch	15	1.21480	0.17041
McBean	0	.	.
Middendorf	24	0.50004	0.13472
Pee Dee	13	0.26238	0.18305
Tobacco Rd	9	1.14656	0.21999

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.606157	0.712933	.	0.068244	0.714758	0.952415
Black Creek	-0.60616	0.000000	0.106776	.	-0.53791	0.108601	0.346258
Congaree	-0.71293	-0.10678	0.000000	.	-0.64469	0.001825	0.239482
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.06824	0.537913	0.644689	.	0.000000	0.646514	0.884171
Middendorf	-0.71476	-0.1086	-0.00183	.	-0.64651	0.000000	0.237657
Pee Dee	-0.95242	-0.34626	-0.23948	.	-0.88417	-0.23766	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.47924	0.118436	0.233695	.	-0.48513	0.282779	0.455086
Black Creek	0.118436	-0.49606	-0.38095	.	-0.02283	-0.33277	-0.15925
Congaree	0.233695	-0.38095	-0.47924	.	0.091312	-0.43015	-0.25785
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.48513	-0.02283	0.091312	.	-0.61869	0.133520	0.315055
Middendorf	0.282779	-0.33277	-0.43015	.	0.133520	-0.37887	-0.21431
Pee Dee	0.455086	-0.15925	-0.25785	.	0.315055	-0.21431	-0.51478

Positive values show pairs of means that are significantly different.

FIGURE 9k.

Oneway Anova

Summary of Fit

RSquare	0.109487
RSquare Adj	0.05648
Root Mean Square Error	0.685492
Mean of Response	0.650411
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4.852956	0.970591	2.0655
Error	84	39.471596	0.469900	Prob>F
C Total	89	44.324552		0.0778

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.368643	0.18321
Congaree	15	0.786067	0.17699
Dry Branch	15	0.910200	0.17699
McBean	0	.	.
Middendorf	24	0.640292	0.13993
Pee Dee	13	0.301385	0.19012
Tobacco Rd	9	0.960778	0.22850

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.124133	0.541557	.	-0.05058	0.269908	0.608815
Congaree	-0.12413	0.000000	0.417424	.	-0.17471	0.145775	0.484682
Black Creek	-0.54156	-0.41742	0.000000	.	-0.59213	-0.27165	0.067258
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.050578	0.174711	0.592135	.	0.000000	0.320486	0.659393
Middendorf	-0.26991	-0.14577	0.271649	.	-0.32049	0.000000	0.338907
Pee Dee	-0.60882	-0.48468	-0.06726	.	-0.65939	-0.33891	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

t

1.98862

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.49776	-0.37363	0.034983	.	-0.52419	-0.17877	0.092261
Congaree	-0.37363	-0.49776	-0.08915	.	-0.40006	-0.3029	-0.03187
Black Creek	0.034983	-0.08915	-0.51523	.	0.009720	-0.18678	-0.45779
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.52419	-0.40006	0.009720	.	-0.64261	-0.21234	0.068277
Middendorf	-0.17877	-0.3029	-0.18678	.	-0.21234	-0.39352	-0.13053
Pee Dee	0.092261	-0.03187	-0.45779	.	0.068277	-0.13053	-0.53468

Positive values show pairs of means that are significantly different.

FIGURE 91.

alpha-D glucose By Aquifers

Oneway Anova

Summary of Fit

RSquare 0.176499
 RSquare Adj 0.127481
 Root Mean Square Error 0.835943
 Mean of Response 1.010389
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	12.580893	2.51618	3.6007
Error	84	58.699276	0.69880	Prob>F
C Total	89	71.280169		0.0053

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.89307	0.22342
Congaree	15	1.10240	0.21584
Dry Branch	15	1.63913	0.21584
McBean	0	.	.
Middendorf	24	0.77604	0.17064
Pee Dee	13	0.47538	0.23185
Tobacco Rd	9	1.38933	0.27865

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.00000	0.53673	0.74606	.	0.24980	0.86309	1.16375
Congaree	-0.53673	0.00000	0.20933	.	-0.28693	0.32636	0.62702
Black Creek	-0.74606	-0.20933	0.00000	.	-0.49626	0.11703	0.41769
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.24980	0.28693	0.49626	.	0.00000	0.61329	0.91395
Middendorf	-0.86309	-0.32636	-0.11703	.	-0.61329	0.00000	0.30066
Pee Dee	-1.16375	-0.62702	-0.41769	.	-0.91395	-0.30066	0.00000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
1.98862							
Dry Branch	-0.60701	-0.07028	0.128305	.	-0.45112	0.315938	0.533822
Congaree	-0.07028	-0.60701	-0.40843	.	-0.41398	-0.2208	-0.00291
Black Creek	0.128305	-0.40843	-0.62832	.	-0.21398	-0.44202	-0.2226
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.45112	-0.41398	-0.21398	.	-0.78365	-0.03648	0.193096
Middendorf	0.315938	-0.2208	-0.44202	.	-0.03648	-0.47989	-0.27181
Pee Dee	0.533822	-0.00291	-0.2226	.	0.193096	-0.27181	-0.65204

Positive values show pairs of means that are significantly different.

FIGURE 9m.

FIGURE 9n.

alpha-D lactose By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.073686
RSquare Adj	0.018548
Root Mean Square Error	0.676833
Mean of Response	0.604467
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	3.061043	0.612209	1.3364
Error	84	38.480664	0.458103	Prob>F
C Total	89	41.541706		0.2569

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.513571	0.18089
Congaree	15	0.681533	0.17476
Dry Branch	15	0.841600	0.17476
McBean	0	.	.
Middendorf	24	0.576250	0.13816
Pee Dee	13	0.251231	0.18772
Tobacco Rd	9	0.807667	0.22561

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.160067	0.328029	.	0.033933	0.265350	0.590369
Congaree	-0.16007	0.000000	0.167962	.	-0.12613	0.105283	0.430303
Black Creek	-0.32803	-0.16796	0.000000	.	-0.2941	-0.06268	0.262341
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.03393	0.126133	0.294095	.	0.000000	0.231417	0.556436
Middendorf	-0.26535	-0.10528	0.062679	.	-0.23142	0.000000	0.325019
Pee Dee	-0.59037	-0.4303	-0.26234	.	-0.55644	-0.32502	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

1.98862							
Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.49148	-0.33141	-0.17215	.	-0.53357	-0.17766	0.080340
Congaree	-0.33141	-0.49148	-0.33221	.	-0.44137	-0.33773	-0.07973
Black Creek	-0.17215	-0.33221	-0.50873	.	-0.28096	-0.38996	-0.25608
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.53357	-0.44137	-0.28096	.	-0.63449	-0.29468	-0.02721
Middendorf	-0.17766	-0.33773	-0.38996	.	-0.29468	-0.38855	-0.13849
Pee Dee	0.080340	-0.07973	-0.25608	.	-0.02721	-0.13849	-0.52793

Positive values show pairs of means that are significantly different.

FIGURE 9o.

Oneway Anova**Summary of Fit**

RSquare	0.112122
RSquare Adj	0.059272
Root Mean Square Error	0.684463
Mean of Response	0.575678
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4.969540	0.993908	2.1215
Error	84	39.353072	0.468489	Prob>F
C Total	89	44.322612		0.0707

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.47050	0.18293
Congaree	15	0.50907	0.17673
Dry Branch	15	0.47940	0.17673
McBean	0	.	.
Middendorf	24	0.63446	0.13972
Pee Dee	13	0.32423	0.18984
Tobacco Rd	9	1.21722	0.22815

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Middendorf	Dry Branch	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Middendorf	0.000000	0.155058	0.163958	.	-0.58276	0.125392	0.310228
Dry Branch	-0.15506	0.000000	0.008900	.	-0.73782	-0.02967	0.155169
Black Creek	-0.16396	-0.0089	0.000000	.	-0.74672	-0.03857	0.146269
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.582764	0.737822	0.746722	.	0.000000	0.708156	0.892991
Congaree	-0.12539	0.029667	0.038567	.	-0.70816	0.000000	0.184836
Pee Dee	-0.31023	-0.15517	-0.14627	.	-0.89299	-0.18484	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Middendorf	Dry Branch	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Middendorf	-0.39293	-0.29295	-0.29379	.	0.050740	-0.32261	-0.1585
Dry Branch	-0.29295	-0.49702	-0.49691	.	0.163918	-0.46735	-0.36061
Black Creek	-0.29379	-0.49691	-0.51446	.	0.165182	-0.46725	-0.37799
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.050740	0.163918	0.165182	.	-0.64164	0.134251	0.302764
Congaree	-0.32261	-0.46735	-0.46725	.	0.134251	-0.49702	-0.33094
Pee Dee	-0.1585	-0.36061	-0.37799	.	0.302764	-0.33094	-0.53388

Positive values show pairs of means that are significantly different.

FIGURE 9p.

maltose By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.096328
RSquare Adj	0.042538
Root Mean Square Error	0.622511
Mean of Response	0.652378
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	3.469884	0.693977	1.7908
Error	84	32.551717	0.387520	Prob>F
C Total	89	36.021601		0.1235

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.638000	0.16637
Congaree	15	0.728467	0.16073
Dry Branch	15	0.870133	0.16073
McBean	0	.	.
Middendorf	24	0.565125	0.12707
Pee Dee	13	0.288308	0.17265
Tobacco Rd	9	0.943556	0.20750

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.141667	0.232133	.	-0.07342	0.305008	0.581826
Congaree	-0.14167	0.000000	0.090467	.	-0.21509	0.163342	0.440159
Black Creek	-0.23213	-0.09047	0.000000	.	-0.30556	0.072875	0.349692
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.073422	0.215089	0.305556	.	0.000000	0.378431	0.655248
Middendorf	-0.30501	-0.16334	-0.07287	.	-0.37843	0.000000	0.276817
Pee Dee	-0.58183	-0.44016	-0.34969	.	-0.65525	-0.27682	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

1.98862	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Abs(Dif)-LSD							
Dry Branch	-0.45203	-0.31036	-0.2279	.	-0.44854	-0.10245	0.112731
Congaree	-0.31036	-0.45203	-0.36957	.	-0.30687	-0.24411	-0.02894
Black Creek	-0.2279	-0.36957	-0.4679	.	-0.22335	-0.34344	-0.12712
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.44854	-0.30687	-0.22335	.	-0.58357	-0.10544	0.118442
Middendorf	-0.10245	-0.24411	-0.34344	.	-0.10544	-0.35736	-0.14949
Pee Dee	0.112731	-0.02894	-0.12712	.	0.118442	-0.14949	-0.48556

Positive values show pairs of means that are significantly different.

FIGURE 9a

D-mannitol By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.103303
RSquare Adj	0.049928
Root Mean Square Error	0.756553
Mean of Response	0.7556
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5.538908	1.10778	1.9354
Error	84	48.079261	0.57237	Prob>F
C Total	89	53.618170		0.0970

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.54607	0.20220
Congaree	15	0.93940	0.19534
Dry Branch	15	1.07453	0.19534
McBean	0	.	.
Middendorf	24	0.60113	0.15443
Pee Dee	13	0.44669	0.20983
Tobacco Rd	9	1.10178	0.25218

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.135133	0.528462	.	-0.02724	0.473408	0.627841
Congaree	-0.13513	0.000000	0.393329	.	-0.16238	0.338275	0.492708
Black Creek	-0.52846	-0.39333	0.000000	.	-0.55571	-0.05505	0.099379
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.027244	0.162378	0.555706	.	0.000000	0.500653	0.655085
Middendorf	-0.47341	-0.33828	0.055054	.	-0.50065	0.000000	0.154433
Pee Dee	-0.62784	-0.49271	-0.09938	.	-0.65509	-0.15443	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.54936	-0.41423	-0.03063	.	-0.60711	-0.02178	0.057739
Congaree	-0.41423	-0.54936	-0.16576	.	-0.47197	-0.15691	-0.07739
Black Creek	-0.03063	-0.16576	-0.56865	.	-0.08708	-0.4509	-0.4801
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.60711	-0.47197	-0.08708	.	-0.70923	-0.08741	0.002693
Middendorf	-0.02178	-0.15691	-0.4509	.	-0.08741	-0.43431	-0.36367
Pee Dee	0.057739	-0.07739	-0.4801	.	0.002693	-0.36367	-0.59011

Positive values show pairs of means that are significantly different.

FIGURE 9r.

D-mannose By Aquifers **Oneway Anova****Summary of Fit**

RSquare 0.101901
 RSquare Adj 0.048443
 Root Mean Square Error 0.709797
 Mean of Response 0.748111
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4.801762	0.960352	1.9062
Error	84	42.320151	0.503811	Prob>F
C Total	89	47.121913		0.1019

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.58043	0.18970
Congaree	15	0.71653	0.18327
Dry Branch	15	1.10080	0.18327
McBean	0	.	.
Middendorf	24	0.66167	0.14489
Pee Dee	13	0.45877	0.19686
Tobacco Rd	9	1.12222	0.23660

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.384267	0.520371	.	-0.02142	0.439133	0.642031
Congaree	-0.38427	0.000000	0.136105	.	-0.40569	0.054867	0.257764
Blck Creek	-0.52037	-0.1361	0.000000	.	-0.54179	-0.08124	0.121659
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.021422	0.405689	0.541794	.	0.000000	0.460556	0.663453
Middendorf	-0.43913	-0.05487	0.081238	.	-0.46056	0.000000	0.202897
Pee Dee	-0.64203	-0.25776	-0.12166	.	-0.66345	-0.2029	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.51541	-0.13115	-0.00416	.	-0.57372	-0.02545	0.107162
Congaree	-0.13115	-0.51541	-0.38843	.	-0.18946	-0.40972	-0.2771
Blck Creek	-0.00416	-0.38843	-0.5335	.	-0.06127	-0.39345	-0.42201
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.57372	-0.18946	-0.06127	.	-0.66539	-0.09116	0.051379
Middendorf	-0.02545	-0.40972	-0.39345	.	-0.09116	-0.40747	-0.28318
Pee Dee	0.107162	-0.2771	-0.42201	.	0.051379	-0.28318	-0.55364

Positive values show pairs of means that are significantly different.

FIGURE 9s.

D-melibiose By Aquifers **Oneway Anova****Summary of Fit**

RSquare	0.044221
RSquare Adj	-0.01267
Root Mean Square Error	0.607086
Mean of Response	0.488133
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1.432355	0.286471	0.7773
Error	84	30.958447	0.368553	Prob>F
C Total	89	32.390802		0.5688

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.370929	0.16225
Congaree	15	0.598067	0.15675
Dry Branch	15	0.520067	0.15675
McBean	0	.	.
Middendorf	24	0.562500	0.12392
Pee Dee	13	0.239000	0.16838
Tobacco Rd	9	0.595556	0.20236

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Congaree	Dry Branch	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	0.000000	0.078000	0.227138	.	0.002511	0.035567	0.359067
Dry Branch	-0.078	0.000000	0.149138	.	-0.07549	-0.04243	0.281067
Black Creek	-0.22714	-0.14914	0.000000	.	-0.22463	-0.19157	0.131929
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.00251	0.075489	0.224627	.	0.000000	0.033056	0.356556
Middendorf	-0.03557	0.042433	0.191571	.	-0.03306	0.000000	0.323500
Pee Dee	-0.35907	-0.28107	-0.13193	.	-0.35656	-0.3235	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

t	1.98862						
Abs(Dif)-LSD	Congaree	Dry Branch	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	-0.44083	-0.36283	-0.22149	.	-0.50651	-0.36179	-0.0984
Dry Branch	-0.36283	-0.44083	-0.29949	.	-0.43354	-0.35493	-0.1764
Black Creek	-0.22149	-0.29949	-0.4563	.	-0.29117	-0.21443	-0.33307
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.50651	-0.43354	-0.29117	.	-0.56911	-0.43882	-0.16695
Middendorf	-0.36179	-0.35493	-0.21443	.	-0.43882	-0.34851	-0.09224
Pee Dee	-0.0984	-0.1764	-0.33307	.	-0.16695	-0.09224	-0.47353

Positive values show pairs of means that are significantly different.

FIGURE 9t.

beta-methyl D-glucoside By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.191073
RSquare Adj	0.142923
Root Mean Square Error	0.534663
Mean of Response	0.555111
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5.671908	1.13438	3.9683
Error	84	24.012595	0.28586	Prob>F
C Total	89	29.684503		0.0028

Means for Oneway Anova

Level	Number	Mean	Std. Error
Blck Creek	14	0.26800	0.14289
Congaree	15	0.65453	0.13805
Dry Branch	15	0.68153	0.13805
McBean	0	.	.
Middendorf	24	0.54654	0.10914
Pee Dee	13	0.23415	0.14829
Tobacco Rd	9	1.11178	0.17822

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.027000	0.413533	.	-0.43024	0.134992	0.447379
Congaree	-0.027	0.000000	0.386533	.	-0.45724	0.107992	0.420379
Blck Creek	-0.41353	-0.38653	0.000000	.	-0.84378	-0.27854	0.033846
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.430244	0.457244	0.843778	.	0.000000	0.565236	0.877624
Middendorf	-0.13499	-0.10799	0.278542	.	-0.56524	0.000000	0.312388
Pee Dee	-0.44738	-0.42038	-0.03385	.	-0.87762	-0.31239	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
1.98862							
Dry Branch	-0.38824	-0.36124	0.018421	.	-0.01806	-0.21496	0.044483
Congaree	-0.36124	-0.38824	-0.00858	.	0.008943	-0.24196	0.017483
Blck Creek	0.018421	-0.00858	-0.40187	.	0.389512	-0.07902	-0.37568
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.01806	0.008943	0.389512	.	-0.50122	0.149650	0.416572
Middendorf	-0.21496	-0.24196	-0.07902	.	0.149650	-0.30693	-0.05376
Pee Dee	0.044483	0.017483	-0.37568	.	0.416572	-0.05376	-0.41704

Positive values show pairs of means that are significantly different.

FIGURE 9u.

D-psicose By Aquifers **Oneway Anova****Summary of Fit**

RSquare	0.049607
RSquare Adj	-0.00696
Root Mean Square Error	0.193719
Mean of Response	0.359478
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.1645390	0.032908	0.8769
Error	84	3.1522854	0.037527	Prob>F
C Total	89	3.3168245		0.5003

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.358786	0.05177
Congaree	15	0.365267	0.05002
Dry Branch	15	0.379533	0.05002
McBean	0	.	.
Middendorf	24	0.352750	0.03954
Pee Dee	13	0.279846	0.05373
Tobacco Rd	9	0.450444	0.06457

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.014267	0.020748	.	-0.07091	0.026783	0.099687
Congaree	-0.01427	0.000000	0.006481	.	-0.08518	0.012517	0.085421
Blck Creek	-0.02075	-0.00648	0.000000	.	-0.09166	0.006036	0.078940
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.070911	0.085178	0.091659	.	0.000000	0.097694	0.170598
Middendorf	-0.02678	-0.01252	-0.00604	.	-0.09769	0.000000	0.072904
Pee Dee	-0.09969	-0.08542	-0.07894	.	-0.1706	-0.0729	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
1.98862							
Abs(Dif)-LSD							
Dry Branch	-0.14067	-0.1264	-0.12241	.	-0.09152	-0.10001	-0.04629
Congaree	-0.1264	-0.14067	-0.13668	.	-0.07725	-0.11428	-0.06056
Blck Creek	-0.12241	-0.13668	-0.1456	.	-0.07293	-0.12352	-0.06944
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.09152	-0.07725	-0.07293	.	-0.1816	-0.05288	0.003550
Middendorf	-0.10001	-0.11428	-0.12352	.	-0.05288	-0.11121	-0.05976
Pee Dee	-0.04629	-0.06056	-0.06944	.	0.003550	-0.05976	-0.1511

Positive values show pairs of means that are significantly different.

FIGURE 9v.

D-raffinose By Aquifers **Oneway Anova****Summary of Fit**

RSquare	0.076771
RSquare Adj	0.021817
Root Mean Square Error	0.58024
Mean of Response	0.510522
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	2.351694	0.470339	1.3970
Error	84	28.280986	0.336678	Prob>F
C Total	89	30.632680		0.2338

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.476929	0.15508
Congaree	15	0.687133	0.14982
Dry Branch	15	0.687267	0.14982
McBean	0	.	.
Middendorf	24	0.538667	0.11844
Pee Dee	13	0.251077	0.16093
Tobacco Rd	9	0.273556	0.19341

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Middendorf	Tobacco Rd	Pee Dee
Dry Branch	0.000000	0.000133	0.210338	.	0.148600	0.413711	0.436190
Congaree	-0.00013	0.000000	0.210205	.	0.148467	0.413578	0.436056
Black Creek	-0.21034	-0.2102	0.000000	.	-0.06174	0.203373	0.225852
McBean	.	.	.	.	.	.	.
Middendorf	-0.1486	-0.14847	0.061738	.	0.000000	0.265111	0.287590
Tobacco Rd	-0.41371	-0.41358	-0.20337	.	-0.26511	0.000000	0.022479
Pee Dee	-0.43619	-0.43606	-0.22585	.	-0.28759	-0.02248	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Middendorf	Tobacco Rd	Pee Dee
Dry Branch	-0.42134	-0.4212	-0.21846	.	-0.23119	-0.07281	-0.00105
Congaree	-0.4212	-0.42134	-0.21859	.	-0.23132	-0.07294	-0.00118
Black Creek	-0.21846	-0.21859	-0.43612	.	-0.32631	-0.28962	-0.21858
McBean	.	.	.	.	.	.	.
Middendorf	-0.23119	-0.23132	-0.32631	.	-0.3331	-0.1859	-0.10977
Tobacco Rd	-0.07281	-0.07294	-0.28962	.	-0.1859	-0.54394	-0.47788
Pee Dee	-0.00105	-0.00118	-0.21858	.	-0.10977	-0.47788	-0.45259

Positive values show pairs of means that are significantly different.

FIGURE 9w.

L-rhamnose By Aquifers **Oneway Anova****Summary of Fit**

RSquare	0.119853
RSquare Adj	0.067463
Root Mean Square Error	0.58902
Mean of Response	0.540944
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	3.968550	0.793710	2.2877
Error	84	29.143372	0.346945	Prob>F
C Total	89	33.111923		0.0532

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.289500	0.15742
Congaree	15	0.893933	0.15208
Dry Branch	15	0.717133	0.15208
McBean	0	.	.
Middendorf	24	0.436792	0.12023
Pee Dee	13	0.353231	0.16336
Tobacco Rd	9	0.599000	0.19634

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Congaree	Dry Branch	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	0.000000	0.176800	0.604433	.	0.294933	0.457142	0.540703
Dry Branch	-0.1768	0.000000	0.427633	.	0.118133	0.280342	0.363903
Black Creek	-0.60443	-0.42763	0.000000	.	-0.3095	-0.14729	-0.06373
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.29493	-0.11813	0.309500	.	0.000000	0.162208	0.245769
Middendorf	-0.45714	-0.28034	0.147292	.	-0.16221	0.000000	0.083561
Pee Dee	-0.5407	-0.3639	0.063731	.	-0.24577	-0.08356	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	Congaree	Dry Branch	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Abs(Dif)-LSD							
Congaree	-0.42771	-0.25091	0.169151	.	-0.19895	0.071608	0.096845
Dry Branch	-0.25091	-0.42771	-0.00765	.	-0.37575	-0.10519	-0.07995
Black Creek	0.169151	-0.00765	-0.44272	.	-0.19095	-0.24662	-0.38743
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.19895	-0.37575	-0.19095	.	-0.55217	-0.29563	-0.26216
Middendorf	0.071608	-0.10519	-0.24662	.	-0.29563	-0.33814	-0.31981
Pee Dee	0.096845	-0.07995	-0.38743	.	-0.26216	-0.31981	-0.45944

Positive values show pairs of means that are significantly different.

FIGURE 9x.

D-sorbitol By Aquifers **Oneway Anova****Summary of Fit**

RSquare 0.155564
 RSquare Adj 0.1053
 Root Mean Square Error 0.735583
 Mean of Response 0.779467
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	8.373075	1.67461	3.0949
Error	84	45.450902	0.54108	Prob>F
C Total	89	53.823976		0.0130

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.41293	0.19659
Congaree	15	0.83153	0.18993
Dry Branch	15	1.03093	0.18993
McBean	0	.	.
Middendorf	24	0.85933	0.15015
Pee Dee	13	0.31146	0.20401
Tobacco Rd	9	1.30678	0.24519

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Middendorf	Blck Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	0.000000	0.171600	0.618005	.	-0.27584	0.199400	0.719472
Middendorf	-0.1716	0.000000	0.446405	.	-0.44744	0.027800	0.547872
Blck Creek	-0.618	-0.4464	0.000000	.	-0.89385	-0.4186	0.101467
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.275844	0.447444	0.893849	.	0.000000	0.475244	0.995316
Congaree	-0.1994	-0.0278	0.418605	.	-0.47524	0.000000	0.520072
Pee Dee	-0.71947	-0.54787	-0.10147	.	-0.99532	-0.52007	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Middendorf	Blck Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	-0.53414	-0.30986	0.074414	.	-0.34092	-0.33474	0.165172
Middendorf	-0.30986	-0.42227	-0.04553	.	-0.12431	-0.45366	0.044132
Blck Creek	0.074414	-0.04553	-0.55288	.	0.268876	-0.12499	-0.46195
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.34092	-0.12431	0.268876	.	-0.68957	-0.14152	0.361006
Congaree	-0.33474	-0.45366	-0.12499	.	-0.14152	-0.53414	-0.03423
Pee Dee	0.165172	0.044132	-0.46195	.	0.361006	-0.03423	-0.57375

Positive values show pairs of means that are significantly different.

FIGURE 9y.

Oneway Anova

Summary of Fit

RSquare	0.152526
RSquare Adj	0.102082
Root Mean Square Error	0.680577
Mean of Response	0.660022
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	7.002484	1.40050	3.0236
Error	84	38.907490	0.46318	Prob>F
C Total	89	45.909974		0.0147

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.73514	0.18189
Congaree	15	0.50560	0.17572
Dry Branch	15	1.08893	0.17572
McBean	0	.	.
Middendorf	24	0.47604	0.13892
Pee Dee	13	0.32015	0.18876
Tobacco Rd	9	1.06722	0.22686

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.353790	0.583333	.	0.021711	0.612892	0.768779
Black Creek	-0.35379	0.000000	0.229543	.	-0.33208	0.259101	0.414989
Congaree	-0.58333	-0.22954	0.000000	.	-0.56162	0.029558	0.185446
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.02171	0.332079	0.561622	.	0.000000	0.591181	0.747068
Middendorf	-0.61289	-0.2591	-0.02956	.	-0.59118	0.000000	0.155888
Pee Dee	-0.76878	-0.41499	-0.18545	.	-0.74707	-0.15589	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
1.98862							
Abs(Dif)-LSD							
Dry Branch	-0.49419	-0.14915	0.089139	.	-0.54894	0.167431	0.255930
Black Creek	-0.14915	-0.51154	-0.2734	.	-0.24616	-0.19604	-0.1063
Congaree	0.089139	-0.2734	-0.49419	.	-0.00902	-0.4159	-0.3274
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.54894	-0.24616	-0.00902	.	-0.638	0.062177	0.160192
Middendorf	0.167431	-0.19604	-0.4159	.	0.062177	-0.39069	-0.31018
Pee Dee	0.255930	-0.1063	-0.3274	.	0.160192	-0.31018	-0.53085

Positive values show pairs of means that are significantly different.

FIGURE 9z.

D-trehalose By Aquifers **Oneway Anova****Summary of Fit**

RSquare 0.095861
 RSquare Adj 0.042043
 Root Mean Square Error 0.762667
 Mean of Response 0.728989
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5.180296	1.03606	1.7812
Error	84	48.859499	0.58166	Prob>F
C Total	89	54.039795		0.1255

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.65929	0.20383
Congaree	15	0.86187	0.19692
Dry Branch	15	1.09007	0.19692
McBean	0	.	.
Middendorf	24	0.67546	0.15568
Pee Dee	13	0.26931	0.21153
Tobacco Rd	9	0.82089	0.25422

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.228200	0.430781	.	0.269178	0.414608	0.820759
Congaree	-0.2282	0.000000	0.202581	.	0.040978	0.186408	0.592559
Black Creek	-0.43078	-0.20258	0.000000	.	-0.1616	-0.01617	0.389978
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.26918	-0.04098	0.161603	.	0.000000	0.145431	0.551581
Middendorf	-0.41461	-0.18641	0.016173	.	-0.14543	0.000000	0.406151
Pee Dee	-0.82076	-0.59256	-0.38998	.	-0.55158	-0.40615	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.5538	-0.3256	-0.13283	.	-0.3703	-0.08458	0.246050
Congaree	-0.3256	-0.5538	-0.36103	.	-0.5985	-0.31278	0.017850
Black Creek	-0.13283	-0.36103	-0.57324	.	-0.48638	-0.49387	-0.19418
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.3703	-0.5985	-0.48638	.	-0.71496	-0.44738	-0.10608
Middendorf	-0.08458	-0.31278	-0.49387	.	-0.44738	-0.43782	-0.11614
Pee Dee	0.246050	0.017850	-0.19418	.	-0.10608	-0.11614	-0.59488

Positive values show pairs of means that are significantly different.

FIGURE 9aa.

Oneway Anova**Summary of Fit**

RSquare	0.041598
RSquare Adj	-0.01545
Root Mean Square Error	0.758466
Mean of Response	0.599511
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	2.097387	0.419477	0.7292
Error	84	48.322768	0.575271	Prob>F
C Total	89	50.420154		0.6035

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.557786	0.20271
Congaree	15	0.646200	0.19584
Dry Branch	15	0.841067	0.19584
McBean	0	.	.
Middendorf	24	0.416208	0.15482
Pee Dee	13	0.526231	0.21036
Tobacco Rd	9	0.778667	0.25282

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	0.000000	0.194867	0.283281	.	0.062400	0.314836	0.424858
Congaree	-0.19487	0.000000	0.088414	.	-0.13247	0.119969	0.229992
Black Creek	-0.28328	-0.08841	0.000000	.	-0.22088	0.031555	0.141577
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.0624	0.132467	0.220881	.	0.000000	0.252436	0.362458
Pee Dee	-0.31484	-0.11997	-0.03155	.	-0.25244	0.000000	0.110022
Middendorf	-0.42486	-0.22999	-0.14158	.	-0.36246	-0.11002	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	-0.55075	-0.35589	-0.27722	.	-0.57355	-0.25671	-0.07158
Congaree	-0.35589	-0.55075	-0.47209	.	-0.50349	-0.45157	-0.26645
Black Creek	-0.27722	-0.47209	-0.57008	.	-0.42353	-0.54939	-0.36566
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.57355	-0.50349	-0.42353	.	-0.71102	-0.40161	-0.22709
Pee Dee	-0.25671	-0.45157	-0.54939	.	-0.40161	-0.5916	-0.40939
Middendorf	-0.07158	-0.26645	-0.36566	.	-0.22709	-0.40939	-0.43541

Positive values show pairs of means that are significantly different.

FIGURE 9bb.

Oneway Anova

Summary of Fit

RSquare 0.107158
 RSquare Adj 0.054013
 Root Mean Square Error 0.561095
 Mean of Response 0.5421
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	3.173958	0.634792	2.0163
Error	84	26.445496	0.314827	Prob>F
C Total	89	29.619454		0.0846

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.38750	0.14996
Congaree	15	0.67807	0.14487
Dry Branch	15	0.57240	0.14487
McBean	0	.	.
Middendorf	24	0.44058	0.11453
Pee Dee	13	0.38085	0.15562
Tobacco Rd	9	1.00911	0.18703

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Congaree	Dry Branch	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	0.000000	0.105667	0.290567	.	-0.33104	0.237483	0.297221
Dry Branch	-0.10567	0.000000	0.184900	.	-0.43671	0.131817	0.191554
Blck Creek	-0.29057	-0.1849	0.000000	.	-0.62161	-0.05308	0.006654
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.331044	0.436711	0.621611	.	0.000000	0.568528	0.628265
Middendorf	-0.23748	-0.13182	0.053083	.	-0.56853	0.000000	0.059737
Pee Dee	-0.29722	-0.19155	-0.00665	.	-0.62826	-0.05974	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Congaree	Dry Branch	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	-0.40743	-0.30177	-0.12408	.	-0.13942	-0.12977	-0.12559
Dry Branch	-0.30177	-0.40743	-0.22975	.	-0.03375	-0.23544	-0.23126
Blck Creek	-0.12408	-0.22975	-0.42173	.	0.144888	-0.32216	-0.42311
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.13942	-0.03375	0.144888	.	-0.52599	0.132396	0.144420
Middendorf	-0.12977	-0.23544	-0.32216	.	0.132396	-0.3221	-0.32451
Pee Dee	-0.12559	-0.23126	-0.42311	.	0.144420	-0.32451	-0.43765

Positive values show pairs of means that are significantly different.

FIGURE 70.

Oneway Anova

Summary of Fit

RSquare	0.116064
RSquare Adj	0.090664
Root Mean Square Error	0.730982
Mean of Response	0.955928
Observations (or Sum Wgts)	180

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	12.20793	2.44159	4.5694
Error	174	92.97435	0.53434	Prob>F
C Total	179	105.18228		0.0006

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	28	0.74868	0.13814
Congaree	30	1.00467	0.13346
Dry Branch	30	1.33797	0.13346
McBean	0	.	.
Middendorf	48	0.84388	0.10551
Pee Dee	26	0.61208	0.14336
Tobacco Rd	18	1.35583	0.17229

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.333300	0.589288	.	-0.01787	0.494092	0.725890
Congaree	-0.3333	0.000000	0.255988	.	-0.35117	0.160792	0.392590
Blck Creek	-0.58929	-0.25599	0.000000	.	-0.60715	-0.0952	0.136602
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.017867	0.351167	0.607155	.	0.000000	0.511958	0.743756
Middendorf	-0.49409	-0.16079	-0.095196	.	-0.51196	0.000000	0.231798
Pee Dee	-0.72589	-0.39259	-0.1366	.	-0.74376	-0.2318	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.37252	-0.03922	0.210178	.	-0.41228	0.158310	0.339311
Congaree	-0.03922	-0.37252	-0.12312	.	-0.07898	-0.17499	0.006011
Blck Creek	0.210178	-0.12312	-0.38559	.	0.171287	-0.24789	-0.25633
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.41228	-0.07898	0.171287	.	-0.48092	0.113204	0.301378
Middendorf	0.158310	-0.17499	-0.24789	.	0.113204	-0.2945	-0.11952
Pee Dee	0.339311	0.006011	-0.25633	.	0.301378	-0.11952	-0.40015

Positive values show pairs of means that are significantly different.

FIGURE 10a.

mono-methyl succinate By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.139297
RSquare Adj	0.088065
Root Mean Square Error	0.797599
Mean of Response	0.922678
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	8.648445	1.72969	2.7189
Error	84	53.437846	0.63616	Prob>F
C Total	89	62.086292		0.0251

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.57371	0.21317
Congaree	15	1.10473	0.20594
Dry Branch	15	1.29827	0.20594
McBean	0	.	.
Middendorf	24	0.83558	0.16281
Pee Dee	13	0.50208	0.22121
Tobacco Rd	9	1.37589	0.26587

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.193533	0.724552	.	-0.07762	0.462683	0.796190
Congaree	-0.19353	0.000000	0.531019	.	-0.27116	0.269150	0.602656
Blck Creek	-0.72455	-0.53102	0.000000	.	-0.80217	-0.26187	0.071637
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.077622	0.271156	0.802175	.	0.000000	0.540306	0.873812
Middendorf	-0.46268	-0.26915	0.261869	.	-0.54031	0.000000	0.333506
Pee Dee	-0.79619	-0.60266	-0.07164	.	-0.87381	-0.33351	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Abs(Dif)-LSD							
Dry Branch	-0.57917	-0.38564	0.135131	.	-0.59114	-0.05937	0.195157
Congaree	-0.38564	-0.57917	-0.0584	.	-0.39761	-0.25291	0.001624
Blck Creek	0.135131	-0.0584	-0.5995	.	0.124510	-0.27154	-0.53928
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.59114	-0.39761	0.124510	.	-0.7477	-0.07966	0.186024
Middendorf	-0.05937	-0.25291	-0.27154	.	-0.07966	-0.45787	-0.2127
Pee Dee	0.195157	0.001624	-0.53928	.	0.186024	-0.2127	-0.62213

Positive values show pairs of means that are significantly different.

FIGURE 10b.

Oneway Anova**Summary of Fit**

RSquare	0.114005
RSquare Adj	0.061267
Root Mean Square Error	0.672651
Mean of Response	0.989178
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4.890453	0.978091	2.1617
Error	84	38.006534	0.452459	Prob>F
C Total	89	42.896987		0.0660

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.92364	0.17977
Congaree	15	0.90460	0.17368
Dry Branch	15	1.37767	0.17368
McBean	0	.	.
Middendorf	24	0.85217	0.13730
Pee Dee	13	0.72208	0.18656
Tobacco Rd	9	1.33578	0.22422

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.454024	0.473067	.	0.041889	0.525500	0.655590
Black Creek	-0.45402	0.000000	0.019043	.	-0.41213	0.071476	0.201566
Congaree	-0.47307	-0.01904	0.000000	.	-0.43118	0.052433	0.182523
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.04189	0.412135	0.431178	.	0.000000	0.483611	0.613701
Middendorf	-0.5255	-0.07148	-0.05243	.	-0.48361	0.000000	0.130090
Pee Dee	-0.65559	-0.20157	-0.18252	.	-0.6137	-0.13009	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.48844	-0.04306	-0.01537	.	-0.52211	0.085227	0.148713
Black Creek	-0.04306	-0.50558	-0.47804	.	-0.15937	-0.37837	-0.31365
Congaree	-0.01537	-0.47804	-0.48844	.	-0.13282	-0.38784	-0.32435
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.52211	-0.15937	-0.13282	.	-0.63057	-0.03923	0.033659
Middendorf	0.085227	-0.37837	-0.38784	.	-0.03923	-0.38614	-0.33055
Pee Dee	0.148713	-0.31365	-0.32435	.	0.033659	-0.33055	-0.52467

Positive values show pairs of means that are significantly different.

FIGURE 77.

polymers By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.068679
RSquare Adj	0.058191
Root Mean Square Error	0.598172
Mean of Response	0.744598
Observations (or Sum Wgts)	450

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	11.71549	2.34310	6.5484
Error	444	158.86777	0.35781	Prob>F
C Total	449	170.58326		0.0000

Means for Oneway Anova

Level	Number	Mean	Std. Error
Black Creek	70	0.69791	0.07150
Congaree	75	0.73108	0.06907
Dry Branch	75	1.04011	0.06907
McBean	0	.	.
Middendorf	120	0.64218	0.05461
Pee Dee	65	0.54626	0.07419
Tobacco Rd	45	0.90682	0.08917

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.309027	0.342192	.	0.133284	0.397923	0.493845
Congaree	-0.30903	0.000000	0.033166	.	-0.17574	0.088897	0.184818
Black Creek	-0.34219	-0.03317	0.000000	.	-0.20891	0.055731	0.151653
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.13328	0.175742	0.208908	.	0.000000	0.264639	0.360561
Middendorf	-0.39792	-0.0889	-0.05573	.	-0.26464	0.000000	0.095922
Pee Dee	-0.49385	-0.18482	-0.15165	.	-0.36056	-0.09592	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.19198	0.117049	0.146817	.	-0.08839	0.224877	0.294620
Congaree	0.117049	-0.19198	-0.16221	.	-0.04593	-0.08415	-0.01441
Black Creek	0.146817	-0.16221	-0.19872	.	-0.01572	-0.12108	-0.05085
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.08839	-0.04593	-0.01572	.	-0.24784	0.059139	0.132579
Middendorf	0.224877	-0.08415	-0.12108	.	0.059139	-0.15177	-0.08513
Pee Dee	0.294620	-0.01441	-0.05085	.	0.132579	-0.08513	-0.20622

Positive values show pairs of means that are significantly different.

FIGURE 11a.

Oneway Anova

Summary of Fit

RSquare	0.051659
RSquare Adj	-0.00479
Root Mean Square Error	0.554412
Mean of Response	0.616933
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1.406447	0.281289	0.9151
Error	84	25.819298	0.307373	Prob>F
C Total	89	27.225746		0.4753

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.540000	0.14817
Congaree	15	0.653933	0.14315
Dry Branch	15	0.793200	0.14315
McBean	0	.	.
Middendorf	24	0.479750	0.11317
Pee Dee	13	0.569308	0.15377
Tobacco Rd	9	0.815778	0.18480

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch		0.000000	0.139267	0.253200	.	-0.02258	0.223892
Congaree	-0.13927		0.000000	0.113933	.	-0.16184	0.084626
Black Creek	-0.2532	-0.11393		0.000000	.	-0.27578	-0.02931
McBean	.	.	.		.	.	.
Tobacco Rd	0.022578	0.161844	0.275778	.		0.000000	0.246470
Pee Dee	-0.22389	-0.08463	0.029308	.	-0.24647		0.000000
Middendorf	-0.31345	-0.17418	-0.06025	.	-0.33603	-0.08956	

Alpha= 0.05

Comparisons for each pair using Student's t

t

1.98862

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch		-0.40258	-0.26331	-0.15651	.	-0.44228	-0.19389
Congaree	-0.26331		-0.40258	-0.29577	.	-0.30302	-0.33315
Black Creek	-0.15651	-0.29577		-0.41671	.	-0.19527	-0.39534
McBean	.	.	.		.	.	.
Tobacco Rd	-0.44228	-0.30302	-0.19527	.		-0.51973	-0.23161
Pee Dee	-0.19389	-0.33315	-0.39534	.	-0.23161		-0.43244
Middendorf	-0.04943	-0.1887	-0.31052	.	-0.09491	-0.29011	

Positive values show pairs of means that are significantly different.

FIGURE 11b.

alpha-cyclo-dextrin By Aquifers

Oneway. Anova

Summary of Fit

RSquare	0.031521
RSquare Adj	-0.02613
Root Mean Square Error	0.34904
Mean of Response	0.349578
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.333070	0.066614	0.5468
Error	84	10.233606	0.121829	Prob>F
C Total	89	10.566676		0.7403

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.397214	0.09328
Congaree	15	0.447867	0.09012
Dry Branch	15	0.364067	0.09012
McBean	0	.	.
Middendorf	24	0.318417	0.07125
Pee Dee	13	0.256923	0.09681
Tobacco Rd	9	0.304444	0.11635

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Congaree	Blck Creek	Dry Branch	McBean	Middendorf	Tobacco Rd	Pee Dee
Congaree	0.000000	0.050652	0.083800	.	0.129450	0.143422	0.190944
Blck Creek	-0.05065	0.000000	0.033148	.	0.078798	0.092770	0.140291
Dry Branch	-0.0838	-0.03315	0.000000	.	0.045650	0.059622	0.107144
McBean	.	.	.	.	.	.	.
Middendorf	-0.12945	-0.0788	-0.04565	.	0.000000	0.013972	0.061494
Tobacco Rd	-0.14342	-0.09277	-0.05962	.	-0.01397	0.000000	0.047521
Pee Dee	-0.19094	-0.14029	-0.10714	.	-0.06149	-0.04752	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Congaree	Blck Creek	Dry Branch	McBean	Middendorf	Tobacco Rd	Pee Dee
Congaree	-0.25345	-0.20729	-0.16965	.	-0.09901	-0.14924	-0.07208
Blck Creek	-0.20729	-0.26235	-0.22479	.	-0.15463	-0.20378	-0.12705
Dry Branch	-0.16965	-0.22479	-0.25345	.	-0.18281	-0.23304	-0.15588
McBean	.	.	.	.	.	.	.
Middendorf	-0.09901	-0.15463	-0.18281	.	-0.20037	-0.25733	-0.17753
Tobacco Rd	-0.14924	-0.20378	-0.23304	.	-0.25733	-0.3272	-0.25346
Pee Dee	-0.07208	-0.12705	-0.15588	.	-0.17753	-0.25346	-0.27225

Positive values show pairs of means that are significantly different.

FIGURE 11c.

dextrin By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.134728
RSquare Adj	0.083224
Root Mean Square Error	0.626902
Mean of Response	0.674778
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5.140248	1.02805	2.6159
Error	84	33.012531	0.39301	Prob>F
C Total	89	38.152780		0.0301

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.62600	0.16755
Congaree	15	0.83220	0.16187
Dry Branch	15	1.04093	0.16187
McBean	0	.	.
Middendorf	24	0.55333	0.12797
Pee Dee	13	0.26069	0.17387
Tobacco Rd	9	0.80000	0.20897

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.208733	0.414933	.	0.240933	0.487600	0.780241
Congaree	-0.20873	0.000000	0.206200	.	0.032200	0.278867	0.571508
Black Creek	-0.41493	-0.2062	0.000000	.	-0.174	0.072667	0.365308
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.24093	-0.0322	0.174000	.	0.000000	0.246667	0.539308
Middendorf	-0.4876	-0.27887	-0.07267	.	-0.24667	0.000000	0.292641
Pee Dee	-0.78024	-0.57151	-0.36531	.	-0.53931	-0.29264	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.45522	-0.24649	-0.04834	.	-0.28471	0.077271	0.307838
Congaree	-0.24649	-0.45522	-0.25708	.	-0.49344	-0.13146	0.099104
Black Creek	-0.04834	-0.25708	-0.4712	.	-0.35864	-0.34658	-0.11486
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.28471	-0.49344	-0.35864	.	-0.58769	-0.24062	-0.00128
Middendorf	0.077271	-0.13146	-0.34658	.	-0.24062	-0.35988	-0.13667
Pee Dee	0.307838	0.099104	-0.11486	.	-0.00128	-0.13667	-0.48898

Positive values show pairs of means that are significantly different.

FIGURE 11d.

tween 80 By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.198805
RSquare Adj	0.151115
Root Mean Square Error	0.499469
Mean of Response	0.823544
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5.199784	1.03996	4.1687
Error	84	20.955434	0.24947	Prob>F
C Total	89	26.155218		0.0020

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.77729	0.13349
Congaree	15	0.61887	0.12896
Dry Branch	15	1.28567	0.12896
McBean	0	.	.
Middendorf	24	0.68687	0.10195
Pee Dee	13	0.65923	0.13853
Tobacco Rd	9	1.06822	0.16649

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Blck Creek	Middendorf	McBean	Tobacco Rd	Pee Dee	Congaree
Dry Branch	0.000000	0.508381	0.598792	.	0.217444	0.626436	0.666800
Blck Creek	-0.50838	0.000000	0.090411	.	-0.29094	0.118055	0.158419
Middendorf	-0.59879	-0.09041	0.000000	.	-0.38135	0.027644	0.068008
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.21744	0.290937	0.381347	.	0.000000	0.408991	0.449356
Pee Dee	-0.62644	-0.11805	-0.02764	.	-0.40899	0.000000	0.040364
Congaree	-0.6668	-0.15842	-0.06801	.	-0.44936	-0.04036	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Blck Creek	Middendorf	McBean	Tobacco Rd	Pee Dee	Congaree
Dry Branch	-0.36268	0.139276	0.271872	.	-0.20135	0.250060	0.304115
Blck Creek	0.139276	-0.37541	-0.24362	.	-0.13343	-0.26451	-0.21069
Middendorf	0.271872	-0.24362	-0.28673	.	-0.00688	-0.3144	-0.25891
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.20135	-0.13343	-0.00688	.	-0.46822	-0.02171	0.030563
Pee Dee	0.250060	-0.26451	-0.3144	.	-0.02171	-0.38959	-0.33601
Congaree	0.304115	-0.21069	-0.25891	.	0.030563	-0.33601	-0.36268

Positive values show pairs of means that are significantly different.

FIGURE 11e.

tween 40 By Aquifers

Oneway Anova

Summary of Fit

RSquare 0.197341
 RSquare Adj 0.149564
 Root Mean Square Error 0.51943
 Mean of Response 1.258156
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob>F
Model	5	5.572118	1.11442	4.1304	
Error	84	22.663806	0.26981		
C Total	89	28.235924			0.0021

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	1.14907	0.13882
Congaree	15	1.10253	0.13412
Dry Branch	15	1.71667	0.13412
McBean	0	.	.
Middendorf	24	1.17254	0.10603
Pee Dee	13	0.98515	0.14406
Tobacco Rd	9	1.54567	0.17314

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Middendorf	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	0.000000	0.544125	0.567595	.	0.171000	0.614133	0.731513
Middendorf	-0.54412	0.000000	0.023470	.	-0.37312	0.070008	0.187388
Black Creek	-0.5676	-0.02347	0.000000	.	-0.3966	0.046538	0.163918
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.171	0.373125	0.396595	.	0.000000	0.443133	0.560513
Congaree	-0.61413	-0.07001	-0.04654	.	-0.44313	0.000000	0.117379
Pee Dee	-0.73151	-0.18739	-0.16392	.	-0.56051	-0.11738	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Middendorf	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	-0.37718	0.204140	0.183740	.	-0.26453	0.236954	0.340096
Middendorf	0.204140	-0.29819	-0.32391	.	-0.03062	-0.26998	-0.16833
Black Creek	0.183740	-0.32391	-0.39042	.	-0.04473	-0.33732	-0.23394
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.26453	-0.03062	-0.04473	.	-0.48694	0.007605	0.112597
Congaree	0.236954	-0.26998	-0.33732	.	0.007605	-0.37718	-0.27404
Pee Dee	0.340096	-0.16833	-0.23394	.	0.112597	-0.27404	-0.40516

Positive values show pairs of means that are significantly different.

FIGURE 12.

carboxylic acids By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.101771
RSquare Adj	0.09977
Root Mean Square Error	0.575794
Mean of Response	0.666681
Observations (or Sum Wgts)	2250

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	84.29378	16.8588	50.8500
Error	2244	743.97328	0.3315	Prob>F
C Total	2249	828.26706		0.0000

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	350	0.566397	0.03078
Congaree	375	0.688472	0.02973
Dry Branch	375	0.951947	0.02973
McBean	0	.	.
Middendorf	600	0.551388	0.02351
Pee Dee	325	0.417289	0.03194
Tobacco Rd	225	0.978596	0.03839

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.263475	0.385550	.	-0.02665	0.400558	0.534657
Congaree	-0.26347	0.000000	0.122075	.	-0.29012	0.137084	0.271183
Black Creek	-0.38555	-0.12207	0.000000	.	-0.4122	0.015009	0.149108
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.026649	0.290124	0.412198	.	0.000000	0.427207	0.561306
Middendorf	-0.40056	-0.13708	-0.01501	.	-0.42721	0.000000	0.134099
Pee Dee	-0.53466	-0.27118	-0.14911	.	-0.56131	-0.1341	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.08246	0.181012	0.301627	.	-0.06857	0.326228	0.449082
Congaree	0.181012	-0.08246	0.038153	.	0.194904	0.062753	0.185607
Black Creek	0.301627	0.038153	-0.08536	.	0.315712	-0.06094	0.062125
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.06857	0.194904	0.315712	.	-0.10646	0.338936	0.463379
Middendorf	0.326228	0.062753	-0.06094	.	0.338936	-0.06519	0.056329
Pee Dee	0.449082	0.185607	0.062125	.	0.463379	0.056329	-0.08858

Positive values show pairs of means that are significantly different.

FIGURE 12a.

acetic acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.028143
RSquare Adj	-0.02971
Root Mean Square Error	0.213367
Mean of Response	0.364811
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.1107393	0.022148	0.4865
Error	84	3.8241225	0.045525	Prob>F
C Total	89	3.9348618		0.7855

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.368500	0.05702
Congaree	15	0.386400	0.05509
Dry Branch	15	0.392200	0.05509
McBean	0	.	.
Middendorf	24	0.381708	0.04355
Pee Dee	13	0.285000	0.05918
Tobacco Rd	9	0.347667	0.07112

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Middendorf	Tobacco Rd	Pee Dee
Dry Branch	0.000000	0.005800	0.023700	.	0.010492	0.044533	0.107200
Congaree	-0.0058	0.000000	0.017900	.	0.004692	0.038733	0.101400
Black Creek	-0.0237	-0.0179	0.000000	.	-0.01321	0.020833	0.083500
McBean	.	.	.	.	.	.	.
Middendorf	-0.01049	-0.00469	0.013208	.	0.000000	0.034042	0.096708
Tobacco Rd	-0.04453	-0.03873	-0.02083	.	-0.03404	0.000000	0.062667
Pee Dee	-0.1072	-0.1014	-0.0835	.	-0.09671	-0.06267	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Middendorf	Tobacco Rd	Pee Dee
Dry Branch	-0.15493	-0.14913	-0.13398	.	-0.12916	-0.13437	-0.05358
Congaree	-0.14913	-0.15493	-0.13978	.	-0.13496	-0.14017	-0.05938
Black Creek	-0.13398	-0.13978	-0.16037	.	-0.12948	-0.16045	-0.07993
McBean	.	.	.	.	.	.	.
Middendorf	-0.12916	-0.13496	-0.12948	.	-0.12249	-0.13181	-0.04941
Tobacco Rd	-0.13437	-0.14017	-0.16045	.	-0.13181	-0.20002	-0.12132
Pee Dee	-0.05358	-0.05938	-0.07993	.	-0.04941	-0.12132	-0.16643

Positive values show pairs of means that are significantly different.

FIGURE 12b.

cis-aconitic acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.153932
RSquare Adj	0.10357
Root Mean Square Error	0.625606
Mean of Response	0.704278
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5.981411	1.19628	3.0566
Error	84	32.876167	0.39138	Prob>F
C Total	89	38.857578		.00139

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.57257	0.16720
Congaree	15	0.94933	0.16153
Dry Branch	15	1.08740	0.16153
McBean	0	.	.
Middendorf	24	0.59600	0.12770
Pee Dee	13	0.28138	0.17351
Tobacco Rd	9	0.76178	0.20854

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.138067	0.514829	.	0.325622	0.491400	0.806015
Congaree	-0.13807	0.000000	0.376762	.	0.187556	0.353333	0.667949
Blck Creek	-0.51483	-0.37676	0.000000	.	-0.18921	-0.02343	0.291187
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.32562	-0.18756	0.189206	.	0.000000	0.165778	0.480393
Middendorf	-0.4914	-0.35333	0.023429	.	-0.16578	0.000000	0.314615
Pee Dee	-0.80602	-0.66795	-0.29119	.	-0.48039	-0.31462	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.45428	-0.31621	0.052510	.	-0.19893	0.081919	0.334589
Congaree	-0.31621	-0.45428	-0.08556	.	-0.337	-0.05615	0.196522
Blck Creek	0.052510	-0.08556	-0.47022	.	-0.34233	-0.39495	-0.18799
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.19893	-0.337	-0.34233	.	-0.58647	-0.3205	-0.05908
Middendorf	0.081919	-0.05615	-0.39495	.	-0.3205	-0.35914	-0.11381
Pee Dee	0.334589	0.196522	-0.18799	.	-0.05908	-0.11381	-0.48797

Positive values show pairs of means that are significantly different.

FIGURE 12c.

citric acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.138878
RSquare Adj	0.08762
Root Mean Square Error	0.503472
Mean of Response	0.590567
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	3.433971	0.686794	2.7094
Error	84	21.292619	0.253484	Prob>F
C Total	89	24.726590		0.0255

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.480357	0.13456
Congaree	15	0.566200	0.13000
Dry Branch	15	0.905333	0.13000
McBean	0	.	.
Middendorf	24	0.532708	0.10277
Pee Dee	13	0.301692	0.13964
Tobacco Rd	9	0.849556	0.16782

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.339133	0.424976	.	0.055778	0.372625	0.603641
Congaree	-0.33913	0.000000	0.085843	.	-0.28336	0.033492	0.264508
Black Creek	-0.42498	-0.08584	0.000000	.	-0.3692	-0.05235	0.178665
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.05578	0.283356	0.369198	.	0.000000	0.316847	0.547863
Middendorf	-0.37262	-0.03349	0.052351	.	-0.31685	0.000000	0.231016
Pee Dee	-0.60364	-0.26451	-0.17866	.	-0.54786	-0.23102	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

t							
1.98862							
Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.36559	-0.02646	0.052914	.	-0.36637	0.043086	0.224249
Congaree	-0.02646	-0.36559	-0.28622	.	-0.13879	-0.29605	-0.11488
Black Creek	0.052914	-0.28622	-0.37842	.	-0.05857	-0.28435	-0.20697
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.36637	-0.13879	-0.05857	.	-0.47198	-0.07449	0.113708
Middendorf	0.043086	-0.29605	-0.28435	.	-0.07449	-0.28903	-0.11377
Pee Dee	0.224249	-0.11488	-0.20697	.	0.113708	-0.11377	-0.39271

Positive values show pairs of means that are significantly different.

FIGURE 12d.

formic acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.073816
RSquare Adj	0.018686
Root Mean Square Error	0.238572
Mean of Response	0.376578
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.3810373	0.076207	1.3389
Error	84	4.7809786	0.056916	Prob>F
C Total	89	5.1620160		0.2559

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.302071	0.06376
Congaree	15	0.395733	0.06160
Dry Branch	15	0.411533	0.06160
McBean	0	.	.
Middendorf	24	0.392833	0.04870
Pee Dee	13	0.276846	0.06617
Tobacco Rd	9	0.503000	0.07952

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.015800	0.109462	.	-0.09147	0.018700	0.134687
Congaree	-0.0158	0.000000	0.093662	.	-0.10727	0.002900	0.118887
Black Creek	-0.10946	-0.09366	0.000000	.	-0.20093	-0.09076	0.025225
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.091467	0.107267	0.200929	.	0.000000	0.110167	0.226154
Middendorf	-0.0187	-0.0029	0.090762	.	-0.11017	0.000000	0.115987
Pee Dee	-0.13469	-0.11889	-0.02523	.	-0.22615	-0.11599	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.17324	-0.15744	-0.06684	.	-0.10857	-0.13745	-0.04509
Congaree	-0.15744	-0.17324	-0.08264	.	-0.09277	-0.15325	-0.06089
Black Creek	-0.06684	-0.08264	-0.17932	.	-0.00177	-0.06879	-0.15751
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.10857	-0.09277	-0.00177	.	-0.22365	-0.07527	0.020428
Middendorf	-0.13745	-0.15325	-0.06879	.	-0.07527	-0.13696	-0.04739
Pee Dee	-0.04509	-0.06089	-0.15751	.	0.020428	-0.04739	-0.18609

Positive values show pairs of means that are significantly different.

FIGURE 12e.

D-galactonic acid lactone By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.100042
RSquare Adj	0.046473
Root Mean Square Error	0.632288
Mean of Response	0.7445
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	3.733083	0.746617	1.8675
Error	84	33.582178	0.399788	Prob>F
C Total	89	37.315260		0.1087

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.59757	0.16899
Congaree	15	0.77980	0.16326
Dry Branch	15	0.89933	0.16326
McBean	0	.	.
Middendorf	24	0.61233	0.12907
Pee Dee	13	0.57908	0.17537
Tobacco Rd	9	1.24756	0.21076

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.119533	0.301762	.	-0.34822	0.287000	0.320256
Congaree	-0.11953	0.000000	0.182229	.	-0.46776	0.167467	0.200723
Blck Creek	-0.30176	-0.18223	0.000000	.	-0.64998	-0.01476	0.018495
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.348222	0.467756	0.649984	.	0.000000	0.635222	0.668479
Middendorf	-0.287	-0.16747	0.014762	.	-0.63522	0.000000	0.033256
Pee Dee	-0.32026	-0.20072	-0.01849	.	-0.66848	-0.03326	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
t	1.98862						
Abs(Dif)-LSD							
Dry Branch	-0.45913	-0.3396	-0.16549	.	-0.18194	-0.12685	-0.15621
Congaree	-0.3396	-0.45913	-0.28503	.	-0.0624	-0.24639	-0.27574
Blck Creek	-0.16549	-0.28503	-0.47524	.	0.112773	-0.40809	-0.4658
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.18194	-0.0624	0.112773	.	-0.59273	0.143753	0.123243
Middendorf	-0.12685	-0.24639	-0.40809	.	0.143753	-0.36297	-0.39975
Pee Dee	-0.15621	-0.27574	-0.4658	.	0.123243	-0.39975	-0.49318

Positive values show pairs of means that are significantly different.

FIGURE 12f.

Oneway Anova**Summary of Fit**

RSquare	0.124578
RSquare Adj	0.07247
Root Mean Square Error	0.556226
Mean of Response	0.6274
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	3.698334	0.739667	2.3907
Error	84	25.988542	0.309387	Prob>F
C Total	89	29.686876		0.0445

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.60121	0.14866
Congaree	15	0.59607	0.14362
Dry Branch	15	1.00860	0.14362
McBean	0	.	.
Middendorf	24	0.47987	0.11354
Pee Dee	13	0.39908	0.15427
Tobacco Rd	9	0.80822	0.18541

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.407386	0.412533	.	0.200378	0.528725	0.609523
Black Creek	-0.40739	0.000000	0.005148	.	-0.20701	0.121339	0.202137
Congaree	-0.41253	-0.00515	0.000000	.	-0.21216	0.116192	0.196990
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.20038	0.207008	0.212156	.	0.000000	0.328347	0.409145
Middendorf	-0.52872	-0.12134	-0.11619	.	-0.32835	0.000000	0.080798
Pee Dee	-0.60952	-0.20214	-0.19699	.	-0.40915	-0.0808	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.4039	-0.00366	0.008635	.	-0.266	0.164656	0.190378
Black Creek	-0.00366	-0.41807	-0.4059	.	-0.26558	-0.25065	-0.2239
Congaree	0.008635	-0.4059	-0.4039	.	-0.25423	-0.24788	-0.22216
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.266	-0.26558	-0.25423	.	-0.52143	-0.104	-0.0705
Middendorf	0.164656	-0.25065	-0.24788	.	-0.104	-0.31931	-0.30012
Pee Dee	0.190378	-0.2239	-0.22216	.	-0.0705	-0.30012	-0.43386

Positive values show pairs of means that are significantly different.

FIGURE 12g.

D-gluconic acid By Aquifers **Oneway Anova****Summary of Fit**

RSquare	0.285225
RSquare Adj	0.242679
Root Mean Square Error	0.57941
Mean of Response	0.839056
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	11.253045	2.25061	6.7039
Error	84	28.200164	0.33572	Prob>F
C Total	89	39.453209		0.0000

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.83786	0.15485
Congaree	15	0.64907	0.14960
Dry Branch	15	1.30287	0.14960
McBean	0	.	.
Middendorf	24	0.63279	0.11827
Pee Dee	13	0.42831	0.16070
Tobacco Rd	9	1.52789	0.19314

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Blck Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.00000	0.46501	0.65380	.	-0.22502	0.67008	0.87456
Blck Creek	-0.46501	0.00000	0.18879	.	-0.69003	0.20507	0.40955
Congaree	-0.65380	-0.18879	0.00000	.	-0.87882	0.01628	0.22076
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.22502	0.69003	0.87882	.	0.00000	0.89510	1.09958
Middendorf	-0.67008	-0.20507	-0.01628	.	-0.89510	0.00000	0.20448
Pee Dee	-0.87456	-0.40955	-0.22076	.	-1.09958	-0.20448	0.00000

Alpha= 0.05

Comparisons for each pair using Student's t

		Dry Branch	Blck Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Abs(Dif)-LSD	1.98862							
Dry Branch		-0.42073	0.036829	0.233067	.	-0.2608	0.290831	0.437943
Blck Creek		0.036829	-0.4355	-0.23939	.	0.197747	-0.18242	-0.03425
Congaree		0.233067	-0.23939	-0.42073	.	0.393001	-0.36297	-0.21586
McBean		.	.	.	.	.	.	.
Tobacco Rd		-0.2608	0.197747	0.393001	.	-0.54316	0.444729	0.599943
Middendorf		0.290831	-0.18242	-0.36297	.	0.444729	-0.33262	-0.19231
Pee Dee		0.437943	-0.03425	-0.21586	.	0.599943	-0.19231	-0.45194

Positive values show pairs of means that are significantly different.

FIGURE 12h.

Oneway Anova**Summary of Fit**

RSquare	0.164126
RSquare Adj	0.114372
Root Mean Square Error	0.584924
Mean of Response	0.619544
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5.643069	1.12861	3.2987
Error	84	28.739463	0.34214	Prob>F
C Total	89	34.382532		0.0091

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.55586	0.15633
Congaree	15	0.76513	0.15103
Dry Branch	15	1.02233	0.15103
McBean	0	.	.
Middendorf	24	0.40133	0.11940
Pee Dee	13	0.30754	0.16223
Tobacco Rd	9	0.83722	0.19497

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.257200	0.466476	.	0.185111	0.621000	0.714795
Congaree	-0.2572	0.000000	0.209276	.	-0.07209	0.363800	0.457595
Blck Creek	-0.46648	-0.20928	0.000000	.	-0.28137	0.154524	0.248319
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.18511	0.072089	0.281365	.	0.000000	0.435889	0.529684
Middendorf	-0.621	-0.3638	-0.15452	.	-0.43589	0.000000	0.093795
Pee Dee	-0.71479	-0.45759	-0.24832	.	-0.52968	-0.09379	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.42474	-0.16754	0.034221	.	-0.30533	0.238147	0.274024
Congaree	-0.16754	-0.42474	-0.22298	.	-0.41836	-0.01905	0.016824
Blck Creek	0.034221	-0.22298	-0.43964	.	-0.2156	-0.23665	-0.1997
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.30533	-0.41836	-0.2156	.	-0.54833	-0.01877	0.025290
Middendorf	0.238147	-0.01905	-0.23665	.	-0.01877	-0.33578	-0.30677
Pee Dee	0.274024	0.016824	-0.1997	.	0.025290	-0.30677	-0.45624

Positive values show pairs of means that are significantly different.

FIGURE 12i.

Oneway Anova**Summary of Fit**

RSquare	0.164445
RSquare Adj	0.11471
Root Mean Square Error	0.58576
Mean of Response	0.638211
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5.672364	1.13447	3.3064
Error	84	28.821635	0.34311	Prob>F
C Total	89	34.493999		0.0089

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.47429	0.15655
Congaree	15	0.69880	0.15124
Dry Branch	15	0.99533	0.15124
McBean	0	.	.
Middendorf	24	0.53738	0.11957
Pee Dee	13	0.26177	0.16246
Tobacco Rd	9	1.00967	0.19525

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.296533	0.521048	.	-0.01433	0.457958	0.733564
Congaree	-0.29653	0.000000	0.224514	.	-0.31087	0.161425	0.437031
Black Creek	-0.52105	-0.22451	0.000000	.	-0.53538	-0.06309	0.212516
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.014333	0.310867	0.535381	.	0.000000	0.472292	0.747897
Middendorf	-0.45796	-0.16143	0.063089	.	-0.47229	0.000000	0.275606
Pee Dee	-0.73356	-0.43703	-0.21252	.	-0.7479	-0.27561	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.42534	-0.12881	0.088175	.	-0.47681	0.074558	0.292164
Congaree	-0.12881	-0.42534	-0.20836	.	-0.18028	-0.22197	-0.00437
Black Creek	0.088175	-0.20836	-0.44027	.	0.037702	-0.32865	-0.23614
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.47681	-0.18028	0.037702	.	-0.54912	0.016988	0.242783
Middendorf	0.074558	-0.22197	-0.32865	.	0.016988	-0.33626	-0.12553
Pee Dee	0.292164	-0.00437	-0.23614	.	0.242783	-0.12553	-0.45689

Positive values show pairs of means that are significantly different.

FIGURE 12j.

alpha-hydroxy butyric acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.090808
RSquare Adj	0.03669
Root Mean Square Error	0.580686
Mean of Response	0.622144
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	2.828989	0.565798	1.6779
Error	84	28.324486	0.337196	Prob>F
C Total	89	31.153475		0.1488

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.66757	0.15519
Congaree	15	0.54520	0.14993
Dry Branch	15	0.73467	0.14993
McBean	0	.	.
Middendorf	24	0.52383	0.11853
Pee Dee	13	0.41162	0.16105
Tobacco Rd	9	1.05844	0.19356

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Blck Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.067095	0.189467	.	-0.32378	0.210833	0.323051
Blck Creek	-0.0671	0.000000	0.122371	.	-0.39087	0.143738	0.255956
Congaree	-0.18947	-0.12237	0.000000	.	-0.51324	0.021367	0.133585
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.323778	0.390873	0.513244	.	0.000000	0.534611	0.646829
Middendorf	-0.21083	-0.14374	-0.02137	.	-0.53461	0.000000	0.112218
Pee Dee	-0.32305	-0.25596	-0.13358	.	-0.64683	-0.11222	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Blck Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.42166	-0.36203	-0.23219	.	-0.16311	-0.16925	-0.11453
Blck Creek	-0.36203	-0.43646	-0.30675	.	-0.1025	-0.2446	-0.18882
Congaree	-0.23219	-0.30675	-0.42166	.	0.026354	-0.35871	-0.30399
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.16311	-0.1025	0.026354	.	-0.54436	0.083251	0.146090
Middendorf	-0.16925	-0.2446	-0.35871	.	0.083251	-0.33335	-0.28545
Pee Dee	-0.11453	-0.18882	-0.30399	.	0.146090	-0.28545	-0.45294

Positive values show pairs of means that are significantly different.

FIGURE 12k.

Oneway Anova**Summary of Fit**

RSquare 0.148348
 RSquare Adj 0.097654
 Root Mean Square Error 0.704485
 Mean of Response 1.016978
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	7.261756	1.45235	2.9264
Error	84	41.689072	0.49630	Prob>F
C Total	89	48.950828		0.0175

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.68529	0.18828
Congaree	15	1.12153	0.18190
Dry Branch	15	1.29087	0.18190
McBean	0	.	.
Middendorf	24	0.99925	0.14380
Pee Dee	13	0.61692	0.19539
Tobacco Rd	9	1.52733	0.23483

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.169333	0.605581	.	-0.23647	0.291617	0.673944
Congaree	-0.16933	0.000000	0.436248	.	-0.4058	0.122283	0.504610
Black Creek	-0.60558	-0.43625	0.000000	.	-0.84205	-0.31396	0.068363
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.236467	0.405800	0.842048	.	0.000000	0.528083	0.910410
Middendorf	-0.29162	-0.12228	0.313964	.	-0.52808	0.000000	0.382327
Pee Dee	-0.67394	-0.50461	-0.06836	.	-0.91041	-0.38233	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.51155	-0.34222	0.084971	.	-0.35423	-0.16949	0.143078
Congaree	-0.34222	-0.51155	-0.08436	.	-0.18489	-0.33883	-0.02626
Black Creek	0.084971	-0.08436	-0.52951	.	0.243496	-0.15717	-0.47123
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.35423	-0.18489	0.243496	.	-0.66041	-0.0195	0.302917
Middendorf	-0.16949	-0.33883	-0.15717	.	-0.0195	-0.40442	-0.10012
Pee Dee	0.143078	-0.02626	-0.47123	.	0.302917	-0.10012	-0.5495

Positive values show pairs of means that are significantly different.

FIGURE 121.

Oneway Anova**Summary of Fit**

RSquare	0.145103
RSquare Adj	0.094216
Root Mean Square Error	0.629001
Mean of Response	0.784456
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5.640831	1.12817	2.8515
Error	84	33.233912	0.39564	Prob>F
C Total	89	38.874742		0.0199

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.73693	0.16811
Congaree	15	0.84007	0.16241
Dry Branch	15	0.98080	0.16241
McBean	0	.	.
Middendorf	24	0.55033	0.12839
Pee Dee	13	0.57200	0.17445
Tobacco Rd	9	1.36967	0.20967

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	0.000000	0.140733	0.243871	.	-0.38887	0.408800	0.430467
Congaree	-0.14073	0.000000	0.103138	.	-0.5296	0.268067	0.289733
Black Creek	-0.24387	-0.10314	0.000000	.	-0.63274	0.164929	0.186595
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.388867	0.529600	0.632738	.	0.000000	0.797667	0.819333
Pee Dee	-0.4088	-0.26807	-0.16493	.	-0.79767	0.000000	0.021667
Middendorf	-0.43047	-0.28973	-0.1866	.	-0.81933	-0.02167	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	-0.45674	-0.31601	-0.22096	.	-0.13853	-0.06518	0.018764
Congaree	-0.31601	-0.45674	-0.36169	.	0.002199	-0.20592	-0.12197
Black Creek	-0.22096	-0.36169	-0.47277	.	0.098320	-0.31685	-0.23406
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.13853	0.002199	0.098320	.	-0.58965	0.255265	0.330419
Pee Dee	-0.06518	-0.20592	-0.31685	.	0.255265	-0.49062	-0.40908
Middendorf	0.018764	-0.12197	-0.23406	.	0.330419	-0.40908	-0.36109

Positive values show pairs of means that are significantly different.

FIGURE 12m.

p-hydroxyphenyl acetic acid By Aquifers **Oneway Anova****Summary of Fit**

RSquare	0.113075
RSquare Adj	0.060281
Root Mean Square Error	0.662585
Mean of Response	0.706744
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4.701541	0.940308	2.1418
Error	84	36.877546	0.439018	Prob>F
C Total	89	41.579087		0.0683

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.749643	0.17708
Congaree	15	0.841333	0.17108
Dry Branch	15	0.957800	0.17108
McBean	0	.	.
Middendorf	24	0.549708	0.13525
Pee Dee	13	0.304231	0.18377
Tobacco Rd	9	0.997444	0.22086

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.116467	0.208157	.	-0.03964	0.408092	0.653569
Congaree	-0.11647	0.000000	0.091690	.	-0.15611	0.291625	0.537103
Black Creek	-0.20816	-0.09169	0.000000	.	-0.2478	0.199935	0.445412
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.039644	0.156111	0.247802	.	0.000000	0.447736	0.693214
Middendorf	-0.40809	-0.29162	-0.19993	.	-0.44774	0.000000	0.245478
Pee Dee	-0.65357	-0.5371	-0.44541	.	-0.69321	-0.24548	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
1.98862							
Abs(Dif)-LSD							
Dry Branch	-0.48113	-0.36466	-0.28149	.	-0.51592	-0.02559	0.154277
Congaree	-0.36466	-0.48113	-0.39796	.	-0.39945	-0.14206	0.037811
Black Creek	-0.28149	-0.39796	-0.49802	.	-0.31515	-0.24318	-0.06209
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.51592	-0.39945	-0.31515	.	-0.62114	-0.06728	0.121852
Middendorf	-0.02559	-0.14206	-0.24318	.	-0.06728	-0.38037	-0.20827
Pee Dee	0.154277	0.037811	-0.06209	.	0.121852	-0.20827	-0.51682

Positive values show pairs of means that are significantly different.

FIGURE 12n.

itaconic acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.089775
RSquare Adj	0.035595
Root Mean Square Error	0.545181
Mean of Response	0.664633
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	2.462454	0.492491	1.6570
Error	84	24.966715	0.297223	Prob>F
C Total	89	27.429169		0.1540

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.574214	0.14571
Congaree	15	0.752800	0.14077
Dry Branch	15	0.828667	0.14077
McBean	0	.	.
Middendorf	24	0.503208	0.11128
Pee Dee	13	0.538692	0.15121
Tobacco Rd	9	0.997333	0.18173

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	0.000000	0.075867	0.254452	.	-0.16867	0.289974	0.325458
Congaree	-0.07587	0.000000	0.178586	.	-0.24453	0.214108	0.249592
Blck Creek	-0.25445	-0.17859	0.000000	.	-0.42312	0.035522	0.071006
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.168667	0.244533	0.423119	.	0.000000	0.458641	0.494125
Pee Dee	-0.28997	-0.21411	-0.03552	.	-0.45864	0.000000	0.035484
Middendorf	-0.32546	-0.24959	-0.07101	.	-0.49412	-0.03548	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	-0.39588	-0.32001	-0.14843	.	-0.28845	-0.12085	-0.03138
Congaree	-0.32001	-0.39588	-0.2243	.	-0.21259	-0.19671	-0.10725
Blck Creek	-0.14843	-0.2243	-0.40977	.	-0.04008	-0.38206	-0.29359
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.28845	-0.21259	-0.04008	.	-0.51108	-0.01148	0.070363
Pee Dee	-0.12085	-0.19671	-0.38206	.	-0.01148	-0.42524	-0.33787
Middendorf	-0.03138	-0.10725	-0.29359	.	0.070363	-0.33787	-0.31297

Positive values show pairs of means that are significantly different.

FIGURE 12o.

alpha-ketobutyric acid By Aquifers **Oneway Anova****Summary of Fit**

RSquare 0.089569
 RSquare Adj 0.035377
 Root Mean Square Error 0.605774
 Mean of Response 0.688211
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob>F
Model	5	3.032581	0.606516	1.6528	
Error	84	30.824806	0.366962		
C Total	89	33.857387			0.1551

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.49657	0.16190
Congaree	15	0.68687	0.15641
Dry Branch	15	1.07247	0.15641
McBean	0	.	.
Middendorf	24	0.64675	0.12365
Pee Dee	13	0.54792	0.16801
Tobacco Rd	9	0.66133	0.20192

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.385600	0.575895	.	0.411133	0.425717	0.524544
Congaree	-0.3856	0.000000	0.190295	.	0.025533	0.040117	0.138944
Black Creek	-0.5759	-0.1903	0.000000	.	-0.16476	-0.15018	-0.05135
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.41113	-0.02553	0.164762	.	0.000000	0.014583	0.113410
Middendorf	-0.42572	-0.04012	0.150179	.	-0.01458	0.000000	0.098827
Pee Dee	-0.52454	-0.13894	0.051352	.	-0.11341	-0.09883	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.43988	-0.05428	0.128232	.	-0.09679	0.029217	0.068062
Congaree	-0.05428	-0.43988	-0.25737	.	-0.48239	-0.35638	-0.31754
Black Creek	0.128232	-0.25737	-0.45532	.	-0.34992	-0.25494	-0.41264
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.09679	-0.48239	-0.34992	.	-0.56788	-0.45628	-0.40896
Middendorf	0.029217	-0.35638	-0.25494	.	-0.45628	-0.34775	-0.31602
Pee Dee	0.068062	-0.31754	-0.41264	.	-0.40896	-0.31602	-0.4725

Positive values show pairs of means that are significantly different.

FIGURE 12p.

Oneway Anova

Summary of Fit

RSquare	0.146148
RSquare Adj	0.095324
Root Mean Square Error	0.573784
Mean of Response	0.812911
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4.733543	0.946709	2.8755
Error	84	27.655131	0.329228	Prob>F
C Total	89	32.388673		0.0191

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.73064	0.15335
Congaree	15	0.70333	0.14815
Dry Branch	15	1.15007	0.14815
McBean	0	.	.
Middendorf	24	0.64346	0.11712
Pee Dee	13	0.64938	0.15914
Tobacco Rd	9	1.24967	0.19126

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	0.000000	0.419424	0.446733	.	-0.0996	0.500682	0.506608
Black Creek	-0.41942	0.000000	0.027310	.	-0.51902	0.081258	0.087185
Congaree	-0.44673	-0.02731	0.000000	.	-0.54633	0.053949	0.059875
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.099600	0.519024	0.546333	.	0.000000	0.600282	0.606208
Pee Dee	-0.50068	-0.08126	-0.05395	.	-0.60028	0.000000	0.005926
Middendorf	-0.50661	-0.08718	-0.05987	.	-0.60621	-0.00593	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	-0.41665	-0.0046	0.030086	.	-0.3815	0.068306	0.131047
Black Creek	-0.0046	-0.43127	-0.39671	.	0.031520	-0.35823	-0.29654
Congaree	0.030086	-0.39671	-0.41665	.	0.065230	-0.37843	-0.31569
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.3815	0.031520	0.065230	.	-0.53789	0.105495	0.160214
Pee Dee	0.068306	-0.35823	-0.37843	.	0.105495	-0.44755	-0.38701
Middendorf	0.131047	-0.29654	-0.31569	.	0.160214	-0.38701	-0.32939

Positive values show pairs of means that are significantly different.

FIGURE 12g.

alpha-ketovaleric acid By Aquifers

Oneway Anova

Summary of Fit

RSquare 0.104358
 RSquare Adj 0.051046
 Root Mean Square Error 0.449336
 Mean of Response 0.463067
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1.976111	0.395222	1.9575
Error	84	16.959832	0.201903	Prob>F
C Total	89	18.935944		0.0934

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.354500	0.12009
Congaree	15	0.690000	0.11602
Dry Branch	15	0.588400	0.11602
McBean	0	.	.
Middendorf	24	0.426333	0.09172
Pee Dee	13	0.220846	0.12462
Tobacco Rd	9	0.492667	0.14978

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Congaree	Dry Branch	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	0.000000	0.101600	0.335500	.	0.197333	0.263667	0.469154
Dry Branch	-0.1016	0.000000	0.233900	.	0.095733	0.162067	0.367554
Black Creek	-0.3355	-0.2339	0.000000	.	-0.13817	-0.07183	0.133654
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.19733	-0.09573	0.138167	.	0.000000	0.066333	0.271821
Middendorf	-0.26367	-0.16207	0.071833	.	-0.06633	0.000000	0.205487
Pee Dee	-0.46915	-0.36755	-0.13365	.	-0.27182	-0.20549	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Congaree	Dry Branch	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	-0.32628	-0.22468	0.003444	.	-0.17942	-0.03044	0.130556
Dry Branch	-0.22468	-0.32628	-0.09816	.	-0.28102	-0.13204	0.028956
Black Creek	0.003444	-0.09816	-0.33773	.	-0.2436	-0.22867	-0.21051
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.17942	-0.28102	-0.2436	.	-0.42123	-0.28293	-0.11565
Middendorf	-0.03044	-0.13204	-0.22867	.	-0.28293	-0.25795	-0.10223
Pee Dee	0.130556	0.028956	-0.21051	.	-0.11565	-0.10223	-0.35048

Positive values show pairs of means that are significantly different.

FIGURE 12r.

Oneway Anova**Summary of Fit**

RSquare	0.247454
RSquare Adj	0.20266
Root Mean Square Error	0.464516
Mean of Response	0.713778
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	5.959947	1.19199	5.5242
Error	84	18.125112	0.21578	Prob>F
C Total	89	24.085060		0.0002

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.60357	0.12415
Congaree	15	0.66520	0.11994
Dry Branch	15	1.20553	0.11994
McBean	0	.	.
Middendorf	24	0.45567	0.09482
Pee Dee	13	0.64115	0.12883
Tobacco Rd	9	0.93978	0.15484

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	0.000000	0.540333	0.601962	.	0.265756	0.564379	0.749867
Congaree	-0.540333	0.000000	0.061629	.	-0.27458	0.024046	0.209533
Blck Creek	-0.601962	-0.06163	0.000000	.	-0.33621	-0.03758	0.147905
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.26576	0.274578	0.336206	.	0.000000	0.298624	0.484111
Pee Dee	-0.56438	-0.02405	0.037582	.	-0.29862	0.000000	0.185487
Middendorf	-0.74987	-0.20953	-0.1479	.	-0.48411	-0.18549	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	-0.3373	0.203029	0.258687	.	-0.12373	0.214343	0.445825
Congaree	0.203029	-0.3373	-0.28165	.	-0.11491	-0.32599	-0.09451
Blck Creek	0.258687	-0.28165	-0.34914	.	-0.05846	-0.31821	-0.16275
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.12373	-0.11491	-0.05846	.	-0.43546	-0.10194	0.123049
Pee Dee	0.214343	-0.32599	-0.31821	.	-0.10194	-0.36232	-0.13262
Middendorf	0.445825	-0.09451	-0.16275	.	0.123049	-0.13262	-0.26666

Positive values show pairs of means that are significantly different.

FIGURE 12s.

malonic acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.149879
RSquare Adj	0.099276
Root Mean Square Error	0.255209
Mean of Response	0.416156
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.9645632	0.192913	2.9619
Error	84	5.4710686	0.065132	Prob>F
C Total	89	6.4356318		0.0164

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.375714	0.06821
Congaree	15	0.616800	0.06589
Dry Branch	15	0.468533	0.06589
McBean	0	.	.
Middendorf	24	0.382875	0.05209
Pee Dee	13	0.312692	0.07078
Tobacco Rd	9	0.295556	0.08507

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Congaree	Dry Branch	Black Creek	McBean	Middendorf	Pee Dee	Tobacco Rd
Congaree	0.000000	0.148267	0.241086	.	0.233925	0.304108	0.321244
Dry Branch	-0.14827	0.000000	0.092819	.	0.085658	0.155841	0.172978
Black Creek	-0.24109	-0.09282	0.000000	.	-0.00716	0.063022	0.080159
McBean	.	.	.	.	.	.	.
Middendorf	-0.23392	-0.08566	0.007161	.	0.000000	0.070183	0.087319
Pee Dee	-0.30411	-0.15584	-0.06302	.	-0.07018	0.000000	0.017137
Tobacco Rd	-0.32124	-0.17298	-0.08016	.	-0.08732	-0.01714	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

t							
1.98862							
Abs(Dif)-LSD	Congaree	Dry Branch	Black Creek	McBean	Middendorf	Pee Dee	Tobacco Rd
Congaree	-0.18532	-0.03705	0.052488	.	0.066882	0.111794	0.107258
Dry Branch	-0.03705	-0.18532	-0.09578	.	-0.08138	-0.03647	-0.04101
Black Creek	0.052488	-0.09578	-0.19182	.	-0.16351	-0.13245	-0.13667
McBean	.	.	.	.	.	.	.
Middendorf	0.066882	-0.08138	-0.16351	.	-0.14651	-0.10459	-0.11105
Pee Dee	0.111794	-0.03647	-0.13245	.	-0.10459	-0.19906	-0.20294
Tobacco Rd	0.107258	-0.04101	-0.13667	.	-0.11105	-0.20294	-0.23924

Positive values show pairs of means that are significantly different.

FIGURE 12t.

propionic acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.08788
RSquare Adj	0.033587
Root Mean Square Error	0.40003
Mean of Response	0.438111
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1.295103	0.259021	1.6186
Error	84	13.442014	0.160024	Prob>F
C Total	89	14.737117		0.1640

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.329429	0.10691
Congaree	15	0.344333	0.10329
Dry Branch	15	0.487333	0.10329
McBean	0	.	.
Middendorf	24	0.474958	0.08166
Pee Dee	13	0.333769	0.11095
Tobacco Rd	9	0.733889	0.13334

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Middendorf	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	0.000000	0.012375	0.157905	.	-0.24656	0.143000	0.153564
Middendorf	-0.01237	0.000000	0.145530	.	-0.25893	0.130625	0.141189
Black Creek	-0.1579	-0.14553	0.000000	.	-0.40446	-0.0149	-0.00434
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.246556	0.258931	0.404460	.	0.000000	0.389556	0.400120
Congaree	-0.143	-0.13063	0.014905	.	-0.38956	0.000000	0.010564
Pee Dee	-0.15356	-0.14119	0.004341	.	-0.40012	-0.01056	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Middendorf	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	-0.29048	-0.24946	-0.13771	.	-0.08886	-0.14748	-0.14788
Middendorf	-0.24946	-0.22964	-0.122	.	-0.05201	-0.13121	-0.13276
Black Creek	-0.13771	-0.122	-0.30067	.	0.064583	-0.28071	-0.30206
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.08886	-0.05201	0.064583	.	-0.37501	0.054140	0.055165
Congaree	-0.14748	-0.13121	-0.28071	.	0.054140	-0.29048	-0.29088
Pee Dee	-0.14788	-0.13276	-0.30206	.	0.055165	-0.29088	-0.31202

Positive values show pairs of means that are significantly different.

FIGURE 12u.

Oneway Anova

Summary of Fit

RSquare	0.266401
RSquare Adj	0.222735
Root Mean Square Error	0.688154
Mean of Response	0.853111
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	14.445362	2.88907	.61008
Error	84	39.778703	0.47356	Prob>F
C Total	89	54.224065		0.0001

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.90957	0.18392
Congaree	15	0.68987	0.17768
Dry Branch	15	1.41940	0.17768
McBean	0	.	.
Middendorf	24	0.63967	0.14047
Pee Dee	13	0.27462	0.19086
Tobacco Rd	9	1.49833	0.22938

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.00000	0.50983	0.72953	.	-0.07893	0.77973	1.14478
Black Creek	-0.50983	0.00000	0.21970	.	-0.58876	0.26990	0.63496
Congaree	-0.72953	-0.21970	0.00000	.	-0.80847	0.05020	0.41525
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.07893	0.58876	0.80847	.	0.00000	0.85867	1.22372
Middendorf	-0.77973	-0.26990	-0.05020	.	-0.85867	0.00000	0.36505
Pee Dee	-1.14478	-0.63496	-0.41525	.	-1.22372	-0.36505	0.00000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.4997	0.001287	0.229837	.	-0.49807	0.329313	0.626225
Black Creek	0.001287	-0.51724	-0.28884	.	0.004085	-0.19031	0.107868
Congaree	0.229837	-0.28884	-0.4997	.	0.231467	-0.40022	-0.10331
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.49807	0.004085	0.231467	.	-0.64511	0.323773	0.630307
Middendorf	0.329313	-0.19031	-0.40022	.	0.323773	-0.39504	-0.10621
Pee Dee	0.626225	0.107868	-0.10331	.	0.630307	-0.10621	-0.53676

Positive values show pairs of means that are significantly different.

FIGURE 12v.

Oneway Anova

Summary of Fit

RSquare	0.123233
RSquare Adj	0.071044
Root Mean Square Error	0.503975
Mean of Response	0.6147
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	2.998743	0.599749	2.3613
Error	84	21.335190	0.253990	Prob>F
C Total	89	24.333933		0.0468

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.446857	0.13469
Congaree	15	0.634933	0.13013
Dry Branch	15	0.846600	0.13013
McBean	0	.	.
Middendorf	24	0.517583	0.10287
Pee Dee	13	0.436231	0.13978
Tobacco Rd	9	0.972333	0.16799

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]

	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.211667	0.399743	.	-0.12573	0.329017	0.410369
Congaree	-0.21167	0.000000	0.188076	.	-0.3374	0.117350	0.198703
Black Creek	-0.39974	-0.18808	0.000000	.	-0.52548	-0.07073	0.010626
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.125733	0.337400	0.525476	.	0.000000	0.454750	0.536103
Middendorf	-0.32902	-0.11735	0.070726	.	-0.45475	0.000000	0.081353
Pee Dee	-0.41037	-0.1987	-0.01063	.	-0.5361	-0.08135	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

t 1.98862

Abs(Dif)-LSD

	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.36596	-0.15429	0.027309	.	-0.29684	-0.00085	0.030598
Congaree	-0.15429	-0.36596	-0.18436	.	-0.08517	-0.21252	-0.18107
Black Creek	0.027309	-0.18436	-0.3788	.	0.097284	-0.26631	-0.37539
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.29684	-0.08517	0.097284	.	-0.47245	0.063017	0.101514
Middendorf	-0.00085	-0.21252	-0.26631	.	0.063017	-0.28931	-0.26378
Pee Dee	0.030598	-0.18107	-0.37539	.	0.101514	-0.26378	-0.3931

Positive values show pairs of means that are significantly different.

FIGURE 12w.

Oneway Anova

Summary of Fit

RSquare	0.127595
RSquare Adj	0.075666
Root Mean Square Error	0.755126
Mean of Response	0.753222
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob>F
Model	5	7.005392	1.40108	2.4571	
Error	84	47.898110	0.57022		
C Total	89	54.903502			0.0396

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.55586	0.20182
Congaree	15	0.92173	0.19497
Dry Branch	15	1.08200	0.19497
McBean	0	.	.
Middendorf	24	0.68437	0.15414
Pee Dee	13	0.26554	0.20943
Tobacco Rd	9	1.11944	0.25171

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.160267	0.526143	.	-0.03744	0.397625	0.816462
Congaree	-0.16027	0.000000	0.365876	.	-0.19771	0.237358	0.656195
Black Creek	-0.52614	-0.36588	0.000000	.	-0.56359	-0.12852	0.290319
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.037444	0.197711	0.563587	.	0.000000	0.435069	0.853906
Middendorf	-0.39763	-0.23736	0.128518	.	-0.43507	0.000000	0.418837
Pee Dee	-0.81646	-0.65619	-0.29032	.	-0.85391	-0.41884	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

1.98862							
Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.54833	-0.38806	-0.03189	.	-0.59571	-0.09663	0.247435
Congaree	-0.38806	-0.54833	-0.19216	.	-0.43544	-0.2569	0.087168
Black Creek	-0.03189	-0.19216	-0.56757	.	-0.07799	-0.37648	-0.28807
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.59571	-0.43544	-0.07799	.	-0.70789	-0.15188	0.202744
Middendorf	-0.09663	-0.2569	-0.37648	.	-0.15188	-0.43349	-0.09829
Pee Dee	0.247435	0.087168	-0.28807	.	0.202744	-0.09829	-0.589

Positive values show pairs of means that are significantly different.

FIGURE 12x.

Oneway Anova**Summary of Fit**

RSquare 0.143218
 RSquare Adj 0.092219
 Root Mean Square Error 0.40974
 Mean of Response 0.634389
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	2.357348	0.471470	2.8083
Error	84	14.102469	0.167887	Prob>F
C Total	89	16.459817		0.0215

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.506429	0.10951
Congaree	15	0.567133	0.10579
Dry Branch	15	0.909200	0.10579
McBean	0	.	.
Middendorf	24	0.535125	0.08364
Pee Dee	13	0.540692	0.11364
Tobacco Rd	9	0.887556	0.13658

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	0.000000	0.342067	0.402771	.	0.021644	0.368508	0.374075
Congaree	-0.34207	0.000000	0.060705	.	-0.32042	0.026441	0.032008
Blck Creek	-0.40277	-0.0607	0.000000	.	-0.38113	-0.03426	-0.0287
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.02164	0.320422	0.381127	.	0.000000	0.346863	0.352431
Pee Dee	-0.36851	-0.02644	0.034264	.	-0.34686	0.000000	0.005567
Middendorf	-0.37408	-0.03201	0.028696	.	-0.35243	-0.00557	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	-0.29753	0.044538	0.099976	.	-0.32191	0.059748	0.105886
Congaree	0.044538	-0.29753	-0.24209	.	-0.02313	-0.28232	-0.23618
Blck Creek	0.099976	-0.24209	-0.30797	.	0.033000	-0.27957	-0.24532
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.32191	-0.02313	0.033000	.	-0.38411	-0.00646	0.033945
Pee Dee	0.059748	-0.28232	-0.27957	.	-0.00646	-0.3196	-0.27503
Middendorf	0.105886	-0.23618	-0.24532	.	0.033945	-0.27503	-0.23522

Positive values show pairs of means that are significantly different.

FIGURE 13.

alcohols By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.068319
RSquare Adj	0.041546
Root Mean Square Error	0.510374
Mean of Response	0.496828
Observations (or Sum Wgts)	180

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	3.323523	0.664705	2.5518
Error	174	45.323750	0.260481	Prob>F
Total	179	48.647274		0.0295

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	28	0.427179	0.09645
Congaree	30	0.608233	0.09318
Dry Branch	30	0.632267	0.09318
McBean	0	.	.
Middendorf	48	0.433833	0.07367
Pee Dee	26	0.266846	0.10009
Tobacco Rd	18	0.693944	0.12030

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.024033	0.205088	.	-0.06168	0.198433	0.365421
Congaree	-0.02403	0.000000	0.181055	.	-0.08571	0.174400	0.341387
Blck Creek	-0.20509	-0.18105	0.000000	.	-0.26677	-0.00665	0.160332
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.061678	0.085711	0.266766	.	0.000000	0.260111	0.427098
Middendorf	-0.19843	-0.1744	0.006655	.	-0.26011	0.000000	0.166987
Pee Dee	-0.36542	-0.34139	-0.16033	.	-0.4271	-0.16699	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.26009	-0.23606	-0.05961	.	-0.23865	-0.03601	0.095511
Congaree	-0.23606	-0.26009	-0.08364	.	-0.21462	-0.06004	0.071477
Blck Creek	-0.05961	-0.08364	-0.26922	.	-0.03756	-0.23289	-0.11402
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.23865	-0.21462	-0.03756	.	-0.33578	-0.0183	0.118228
Middendorf	-0.03601	-0.06004	-0.23289	.	-0.0183	-0.20562	-0.0783
Pee Dee	0.095511	0.071477	-0.11402	.	0.118228	-0.0783	-0.27938

Positive values show pairs of means that are significantly different.

FIGURE 13a.

"2,3-butanediol" By Aquifers **Oneway Anova****Summary of Fit**

RSquare	0.082806
RSquare Adj	0.028212
Root Mean Square Error	0.128872
Mean of Response	0.286833
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.1259500	0.025190	1.5167
Error	84	1.3950665	0.016608	Prob>F
C Total	89	1.5210165		0.1933

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.284929	0.03444
Congaree	15	0.310667	0.03327
Dry Branch	15	0.239000	0.03327
McBean	0	.	.
Middendorf	24	0.335000	0.02631
Pee Dee	13	0.248000	0.03574
Tobacco Rd	9	0.257444	0.04296

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Middendorf	Blck Creek	Pee Dee	McBean	Congaree	Tobacco Rd	Dry Branch
Middendorf	0.000000	0.050071	0.087000	.	0.024333	0.077556	0.096000
Blck Creek	-0.05007	0.000000	0.036929	.	-0.02574	0.027484	0.045929
Pee Dee	-0.087	-0.03693	0.000000	.	-0.06267	-0.00944	0.009000
McBean	.	.	.	.	.	.	.
Congaree	-0.02433	0.025738	0.062667	.	0.000000	0.053222	0.071667
Tobacco Rd	-0.07756	-0.02748	0.009444	.	-0.05322	0.000000	0.018444
Dry Branch	-0.096	-0.04593	-0.009	.	-0.07167	-0.01844	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Middendorf	Blck Creek	Pee Dee	McBean	Congaree	Tobacco Rd	Dry Branch
Middendorf	-0.07398	-0.03611	-0.00125	.	-0.06002	-0.02261	0.011649
Blck Creek	-0.03611	-0.09686	-0.06178	.	-0.0695	-0.08201	-0.04931
Pee Dee	-0.00125	-0.06178	-0.10052	.	-0.03444	-0.10168	-0.08811
McBean	.	.	.	.	.	.	.
Congaree	-0.06002	-0.0695	-0.03444	.	-0.09358	-0.05483	-0.02191
Tobacco Rd	-0.02261	-0.08201	-0.10168	.	-0.05483	-0.12081	-0.08961
Dry Branch	0.011649	-0.04931	-0.08811	.	-0.02191	-0.08961	-0.09358

Positive values show pairs of means that are significantly different.

FIGURE 13b.

glycerol By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.179399
RSquare Adj	0.130553
Root Mean Square Error	0.618738
Mean of Response	0.706822
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	7.030393	1.40608	3.6728
Error	84	32.158284	0.38284	Prob>F
C Total	89	39.188677		0.0047

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.56943	0.16536
Congaree	15	0.90580	0.15976
Dry Branch	15	1.02553	0.15976
McBean	0	.	.
Middendorf	24	0.53267	0.12630
Pee Dee	13	0.28569	0.17161
Tobacco Rd	9	1.13044	0.20625

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.119733	0.456105	.	-0.10491	0.492867	0.739841
Congaree	-0.11973	0.000000	0.336371	.	-0.22464	0.373133	0.620108
Blck Creek	-0.4561	-0.33637	0.000000	.	-0.56102	0.036762	0.283736
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.104911	0.224644	0.561016	.	0.000000	0.597778	0.844752
Middendorf	-0.49287	-0.37313	-0.03676	.	-0.59778	0.000000	0.246974
Pee Dee	-0.73984	-0.62011	-0.28374	.	-0.84475	-0.24697	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.44929	-0.32956	-0.00114	.	-0.41389	0.087881	0.273590
Congaree	-0.32956	-0.44929	-0.12087	.	-0.29415	-0.03185	0.153857
Blck Creek	-0.00114	-0.12087	-0.46506	.	0.035317	-0.37703	-0.19018
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.41389	-0.29415	0.035317	.	-0.58003	0.116841	0.311200
Middendorf	0.087881	-0.03185	-0.37703	.	0.116841	-0.3552	-0.17675
Pee Dee	0.273590	0.153857	-0.19018	.	0.311200	-0.17675	-0.48262

Positive values show pairs of means that are significantly different.

FIGURE 14.

amides By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.085184
RSquare Adj	0.058896
Root Mean Square Error	0.51649
Mean of Response	0.582317
Observations (or Sum Wgts)	180

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4.322116	0.864423	3.2404
Error	174	46.416573	0.266762	Prob>F
C Total	179	50.738689		0.0080

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	28	0.558857	0.09761
Congaree	30	0.600533	0.09430
Dry Branch	30	0.837900	0.09430
McBean	0	.	.
Middendorf	48	0.528354	0.07455
Pee Dee	26	0.308962	0.10129
Tobacco Rd	18	0.701222	0.12174

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.237367	0.279043	.	0.136678	0.309546	0.528938
Congaree	-0.23737	0.000000	0.041676	.	-0.10069	0.072179	0.291572
Black Creek	-0.27904	-0.04168	0.000000	.	-0.14237	0.030503	0.249896
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.13668	0.100689	0.142365	.	0.000000	0.172868	0.392261
Middendorf	-0.30955	-0.07218	-0.0305	.	-0.17287	0.000000	0.219393
Pee Dee	-0.52894	-0.29157	-0.2499	.	-0.39226	-0.21939	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.26321	-0.02584	0.011175	.	-0.16725	0.072293	0.255794
Congaree	-0.02584	-0.26321	-0.22619	.	-0.20324	-0.16507	0.018427
Black Creek	0.011175	-0.22619	-0.27245	.	-0.16561	-0.21191	-0.02774
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.16725	-0.20324	-0.16561	.	-0.3398	-0.10888	0.079689
Middendorf	0.072293	-0.16507	-0.21191	.	-0.10888	-0.20808	-0.02884
Pee Dee	0.255794	0.018427	-0.02774	.	0.079689	-0.02884	-0.28273

Positive values show pairs of means that are significantly different.

FIGURE 14a.

Oneway Anova**Summary of Fit**

RSquare 0.402323
 RSquare Adj 0.366747
 Root Mean Square Error 0.596712
 Mean of Response 0.979467
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	20.133429	4.02669	11.3088
Error	84	29.909525	0.35607	Prob>F
C Total	89	50.042954		0.0000

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.64686	0.15948
Congaree	15	0.80413	0.15407
Dry Branch	15	1.75140	0.15407
McBean	0	.	.
Middendorf	24	0.68463	0.12180
Pee Dee	13	0.64523	0.16550
Tobacco Rd	9	1.77156	0.19890

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.00000	0.94727	1.10454	.	-0.02016	1.06678	1.10617
Congaree	-0.94727	0.00000	0.15728	.	-0.96742	0.11951	0.15890
Blck Creek	-1.10454	-0.15728	0.00000	.	-1.12470	-0.03777	0.00163
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.02016	0.96742	1.12470	.	0.00000	1.08693	1.12632
Middendorf	-1.06678	-0.11951	0.03777	.	-1.08693	0.00000	0.03939
Pee Dee	-1.10617	-0.15890	-0.00163	.	-1.12632	-0.03939	0.00000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.4333	0.513970	0.663576	.	-0.48017	0.676206	0.656516
Congaree	0.513970	-0.4333	-0.28369	.	0.467094	-0.27106	-0.29075
Blck Creek	0.663576	-0.28369	-0.44851	.	0.617713	-0.36129	-0.45542
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.48017	0.467094	0.617713	.	-0.55938	0.623114	0.611766
Middendorf	0.676206	-0.27106	-0.36129	.	0.623114	-0.34255	-0.36924
Pee Dee	0.656516	-0.29075	-0.45542	.	0.611766	-0.36924	-0.46544

Positive values show pairs of means that are significantly different.

FIGURE 14b.

glucuronamide By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.06658
RSquare Adj	0.011019
Root Mean Square Error	0.423117
Mean of Response	0.522389
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1.072672	0.214534	1.1983
Error	84	15.038349	0.179028	Prob>F
C Total	89	16.111021		0.3171

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.586286	0.11308
Congaree	15	0.610533	0.10925
Dry Branch	15	0.655800	0.10925
McBean	0	.	.
Middendorf	24	0.443208	0.08637
Pee Dee	13	0.330615	0.11735
Tobacco Rd	9	0.541889	0.14104

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.045267	0.069514	.	0.113911	0.212592	0.325185
Congaree	-0.04527	0.000000	0.024248	.	0.068644	0.167325	0.279918
Black Creek	-0.06951	-0.02425	0.000000	.	0.044397	0.143077	0.255670
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.11391	-0.06864	-0.0444	.	0.000000	0.098681	0.211274
Middendorf	-0.21259	-0.16733	-0.14308	.	-0.09868	0.000000	0.112593
Pee Dee	-0.32518	-0.27992	-0.25567	.	-0.21127	-0.11259	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.30724	-0.26198	-0.24317	.	-0.24086	-0.06435	0.006344
Congaree	-0.26198	-0.30724	-0.28843	.	-0.28613	-0.10962	-0.03892
Black Creek	-0.24317	-0.28843	-0.31803	.	-0.3151	-0.13989	-0.06841
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.24086	-0.28613	-0.3151	.	-0.39665	-0.2302	-0.15359
Middendorf	-0.06435	-0.10962	-0.13989	.	-0.2302	-0.2429	-0.17717
Pee Dee	0.006344	-0.03892	-0.06841	.	-0.15359	-0.17717	-0.33003

Positive values show pairs of means that are significantly different.

FIGURE 14c.

alaninamide By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.130632
RSquare Adj	0.078884
Root Mean Square Error	0.593037
Mean of Response	0.642244
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4.439030	0.887806	2.5244
Error	84	29.542196	0.351693	Prob>F
C Total	89	33.981227		0.0353

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.53143	0.15850
Congaree	15	0.59053	0.15312
Dry Branch	15	1.02000	0.15312
McBean	0	.	.
Middendorf	24	0.61350	0.12105
Pee Dee	13	0.28731	0.16448
Tobacco Rd	9	0.86056	0.19768

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Middendorf	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	0.000000	0.406500	0.488571	.	0.159444	0.429467	0.732692
Middendorf	-0.4065	0.000000	0.082071	.	-0.24706	0.022967	0.326192
Black Creek	-0.48857	-0.08207	0.000000	.	-0.32913	-0.0591	0.244121
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.15944	0.247056	0.329127	.	0.000000	0.270022	0.573248
Congaree	-0.42947	-0.02297	0.059105	.	-0.27002	0.000000	0.303226
Pee Dee	-0.73269	-0.32619	-0.24412	.	-0.57325	-0.30323	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	Dry Branch	Middendorf	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
1.98862							
Abs(Dif)-LSD							
Dry Branch	-0.43063	0.018337	0.050321	.	-0.3378	-0.00116	0.285808
Middendorf	0.018337	-0.34044	-0.31453	.	-0.2139	-0.3652	-0.07993
Black Creek	0.050321	-0.31453	-0.44574	.	-0.17474	-0.37915	-0.21011
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.3378	-0.2139	-0.17474	.	-0.55594	-0.22722	0.061859
Congaree	-0.00116	-0.3652	-0.37915	.	-0.22722	-0.43063	-0.14366
Pee Dee	0.285808	-0.07993	-0.21011	.	0.061859	-0.14366	-0.46257

Positive values show pairs of means that are significantly different.

FIGURE 15.

phosphorylated compounds By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.055183
RSquare Adj	0.037289
Root Mean Square Error	0.329997
Mean of Response	0.409626
Observations (or Sum Wgts)	270

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1.679127	0.335825	3.0838
Error	264	28.749108	0.108898	Prob>F
C Total	269	30.428235		0.0101

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	42	0.321762	0.05092
Congaree	45	0.454578	0.04919
Dry Branch	45	0.463356	0.04919
McBean	0	.	.
Middendorf	72	0.427750	0.03889
Pee Dee	39	0.273718	0.05284
Tobacco Rd	27	0.529815	0.06351

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch		0.008778	0.141594	.	-0.06646	0.035606	0.189638
Congaree	-0.00878		0.132816	.	-0.07524	0.026828	0.180860
Black Creek	-0.14159	-0.13282		.	-0.20805	-0.10599	0.048044
McBean	.	.	.		.	.	.
Tobacco Rd	0.066459	0.075237	0.208053	.		0.102065	0.256097
Middendorf	-0.03561	-0.02683	0.105988	.	-0.10206		0.154032
Pee Dee	-0.18964	-0.18086	-0.04804	.	-0.2561	-0.15403	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

t							
1.96902							
Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch		-0.13698	-0.12821	0.002185	.	-0.09172	-0.08787
Congaree	-0.13698		-0.00659	.	-0.08294	-0.09665	0.038705
Black Creek	0.002185	-0.00659		-0.14179	.	0.047774	-0.02017
McBean	.	.	.		.	.	.
Tobacco Rd	-0.09172	-0.08294	0.047774	.		-0.17684	-0.04457
Middendorf	-0.08787	-0.09665	-0.02017	.	-0.04457		-0.10829
Pee Dee	0.047483	0.038705	-0.09645	.	0.093423	0.024844	

Positive values show pairs of means that are significantly different.

FIGURE 15a.

"D,L-alpha glycerol phosphate" By Aquifers **Oneway. Anova****Summary of Fit**

RSquare	0.084259
RSquare Adj	0.029751
Root Mean Square Error	0.147122
Mean of Response	0.315078
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.1672950	0.033459	1.5458
Error	84	1.8181815	0.021645	Prob>F
C Total	89	1.9854765		0.1845

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.286357	0.03932
Congaree	15	0.395533	0.03799
Dry Branch	15	0.284600	0.03799
McBean	0	.	.
Middendorf	24	0.319375	0.03003
Pee Dee	13	0.261385	0.04080
Tobacco Rd	9	0.342556	0.04904

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Congaree	Black Creek	Dry Branch	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	0.000000	0.109176	0.110933	.	0.052978	0.076158	0.134149
Black Creek	-0.10918	0.000000	0.001757	.	-0.0562	-0.03302	0.024973
Dry Branch	-0.11093	-0.00176	0.000000	.	-0.05796	-0.03478	0.023215
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.05298	0.056198	0.057956	.	0.000000	0.023181	0.081171
Middendorf	-0.07616	0.033018	0.034775	.	-0.02318	0.000000	0.057990
Pee Dee	-0.13415	-0.02497	-0.02322	.	-0.08117	-0.05799	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Congaree	Black Creek	Dry Branch	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	-0.10683	0.000454	0.004102	.	-0.07038	-0.02014	0.023284
Black Creek	0.000454	-0.11058	-0.10697	.	-0.0688	-0.06537	-0.08772
Dry Branch	0.004102	-0.10697	-0.10683	.	-0.0654	-0.06152	-0.08765
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.07038	-0.0688	-0.0654	.	-0.13792	-0.09118	-0.0457
Middendorf	-0.02014	-0.06537	-0.06152	.	-0.09118	-0.08446	-0.04276
Pee Dee	0.023284	-0.08772	-0.08765	.	-0.0457	-0.04276	-0.11476

Positive values show pairs of means that are significantly different.

FIGURE 15b.

glucose-1-phosphate By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.095217
RSquare Adj	0.041361
Root Mean Square Error	0.380073
Mean of Response	0.443467
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1.276981	0.255396	1.7680
Error	84	12.134267	0.144456	Prob>F
C Total	89	13.411248		0.1283

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.319429	0.10158
Congaree	15	0.443667	0.09813
Dry Branch	15	0.501867	0.09813
McBean	0	.	.
Middendorf	24	0.483333	0.07758
Pee Dee	13	0.264077	0.10541
Tobacco Rd	9	0.691556	0.12669

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Middendorf	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	0.000000	0.018533	0.182438	.	-0.18969	0.058200	0.237790
Middendorf	-0.01853	0.000000	0.163905	.	-0.20822	0.039667	0.219256
Black Creek	-0.18244	-0.1639	0.000000	.	-0.37213	-0.12424	0.055352
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.189689	0.208222	0.372127	.	0.000000	0.247889	0.427479
Congaree	-0.0582	-0.03967	0.124238	.	-0.24789	0.000000	0.179590
Pee Dee	-0.23779	-0.21926	-0.05535	.	-0.42748	-0.17959	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	Dry Branch	Middendorf	Black Creek	McBean	Tobacco Rd	Congaree	Pee Dee
1.98862							
Abs(Dif)-LSD							
Dry Branch	-0.27599	-0.23024	-0.09843	.	-0.12899	-0.21779	-0.04861
Middendorf	-0.23024	-0.21819	-0.09027	.	-0.0872	-0.2091	-0.04102
Black Creek	-0.09843	-0.09027	-0.28567	.	0.049205	-0.15663	-0.23576
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.12899	-0.0872	0.049205	.	-0.3563	-0.07079	0.099733
Congaree	-0.21779	-0.2091	-0.15663	.	-0.07079	-0.27599	-0.10681
Pee Dee	-0.04861	-0.04102	-0.23576	.	0.099733	-0.10681	-0.29646

Positive values show pairs of means that are significantly different.

FIGURE 15c.

glucose-6-phosphate By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.068623
RSquare Adj	0.013184
Root Mean Square Error	0.391057
Mean of Response	0.470333
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.946460	0.189292	1.2378
Error	84	12.845756	0.152926	Prob>F
C Total	89	13.792216		0.2988

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.359500	0.10451
Congaree	15	0.524533	0.10097
Dry Branch	15	0.603600	0.10097
McBean	0	.	.
Middendorf	24	0.480542	0.07982
Pee Dee	13	0.295692	0.10846
Tobacco Rd	9	0.555333	0.13035

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.079067	0.244100	.	0.048267	0.123058	0.307908
Congaree	-0.07907	0.000000	0.165033	.	-0.0308	0.043992	0.228841
Black Creek	-0.2441	-0.16503	0.000000	.	-0.19583	-0.12104	0.063808
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.04827	0.030800	0.195833	.	0.000000	0.074792	0.259641
Middendorf	-0.12306	-0.04399	0.121042	.	-0.07479	0.000000	0.184849
Pee Dee	-0.30791	-0.22884	-0.06381	.	-0.25964	-0.18485	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.28396	-0.2049	-0.04489	.	-0.27962	-0.1329	0.013226
Congaree	-0.2049	-0.28396	-0.12396	.	-0.29709	-0.21197	-0.06584
Black Creek	-0.04489	-0.12396	-0.29393	.	-0.13642	-0.14048	-0.23572
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.27962	-0.29709	-0.13642	.	-0.36659	-0.22917	-0.07758
Middendorf	-0.1329	-0.21197	-0.14048	.	-0.22917	-0.22449	-0.08295
Pee Dee	0.013226	-0.06584	-0.23572	.	-0.07758	-0.08295	-0.30502

Positive values show pairs of means that are significantly different.

FIGURE 16.

amino acids By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.116549
RSquare Adj	0.114087
Root Mean Square Error	0.656225
Mean of Response	0.719679
Observations (or Sum Wgts)	1800

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	101.91864	20.3837	47.3346
Error	1794	772.55155	0.4306	Prob>F
C Total	1799	874.47019		0.0000

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	280	0.60907	0.03922
Congaree	300	0.80494	0.03789
Dry Branch	300	1.11352	0.03789
McBean	0	.	.
Middendorf	480	0.57975	0.02995
Pee Dee	260	0.37920	0.04070
Tobacco Rd	180	0.95818	0.04891

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.308577	0.504452	.	0.155337	0.533772	0.734320
Congaree	-0.30858	0.000000	0.195875	.	-0.15324	0.225195	0.425743
Black Creek	-0.50445	-0.19588	0.000000	.	-0.34912	0.029320	0.229868
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.15534	0.153240	0.349115	.	0.000000	0.378435	0.578983
Middendorf	-0.53377	-0.2252	-0.02932	.	-0.37844	0.000000	0.200548
Pee Dee	-0.73432	-0.42574	-0.22987	.	-0.57898	-0.20055	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.10509	0.203488	0.397503	.	0.033991	0.439046	0.625264
Congaree	0.203488	-0.10509	0.088927	.	0.031894	0.130470	0.316688
Black Creek	0.397503	0.088927	-0.10878	.	0.226155	-0.06747	0.119019
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.033991	0.031894	0.226155	.	-0.13567	0.265945	0.454186
Middendorf	0.439046	0.130470	-0.06747	.	0.265945	-0.08308	0.101440
Pee Dee	0.625264	0.316688	0.119019	.	0.454186	0.101440	-0.11288

Positive values show pairs of means that are significantly different.

FIGURE 16a.

D-alanine By Aquifers **Oneway Anova****Summary of Fit**

RSquare 0.055306
 RSquare Adj -0.00093
 Root Mean Square Error 0.551951
 Mean of Response 0.573156
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1.498174	0.299635	0.9835
Error	84	25.590600	0.304650	Prob>F
C Total	89	27.088774	0.4328	

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.645000	0.14752
Congaree	15	0.515400	0.14251
Dry Branch	15	0.685067	0.14251
McBean	0	.	.
Middendorf	24	0.644917	0.11267
Pee Dee	13	0.287462	0.15308
Tobacco Rd	9	0.592444	0.18398

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Black Creek	Middendorf	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	0.000000	0.040067	0.040150	.	0.092622	0.169667	0.397605
Black Creek	-0.04007	0.000000	0.000083	.	0.052556	0.129600	0.357538
Middendorf	-0.04015	-0.00008	0.000000	.	0.052472	0.129517	0.357455
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.09262	-0.05256	-0.05247	.	0.000000	0.077044	0.304983
Congaree	-0.16967	-0.1296	-0.12952	.	-0.07704	0.000000	0.227938
Pee Dee	-0.39761	-0.35754	-0.35746	.	-0.30498	-0.22794	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Black Creek	Middendorf	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	-0.40079	-0.36782	-0.32112	.	-0.37017	-0.23113	-0.01832
Black Creek	-0.36782	-0.41486	-0.36904	.	-0.4164	-0.27829	-0.06523
Middendorf	-0.32112	-0.36904	-0.31686	.	-0.37655	-0.23175	-0.02053
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.37017	-0.4164	-0.37655	.	-0.51742	-0.38575	-0.17098
Congaree	-0.23113	-0.27829	-0.23175	.	-0.38575	-0.40079	-0.18799
Pee Dee	-0.01832	-0.06523	-0.02053	.	-0.17098	-0.18799	-0.43052

Positive values show pairs of means that are significantly different.

FIGURE 16b.

L-alanine By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.22652
RSquare Adj	0.18048
Root Mean Square Error	0.600648
Mean of Response	0.771689
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	8.875176	1.77504	4.9200
Error	84	30.305308	0.36078	Prob>F
C Total	89	39.180483		0.0005

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.86379	0.16053
Congaree	15	0.80220	0.15509
Dry Branch	15	1.35787	0.15509
McBean	0	.	.
Middendorf	24	0.47996	0.12261
Pee Dee	13	0.43554	0.16659
Tobacco Rd	9	0.86411	0.20022

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.494081	0.555667	.	0.493756	0.877908	0.922328
Black Creek	-0.49408	0.000000	0.061586	.	-0.00033	0.383827	0.428247
Congaree	-0.55567	-0.06159	0.000000	.	-0.06191	0.322242	0.366662
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.49376	0.000325	0.061911	.	0.000000	0.384153	0.428573
Middendorf	-0.87791	-0.38383	-0.32224	.	-0.38415	0.000000	0.044420
Pee Dee	-0.92233	-0.42825	-0.36666	.	-0.42857	-0.04442	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

t								
1.98862								
Abs(Dif)-LSD	Dry Branch	Blck Creek	Congaree	McBean	Tobacco Rd	Middendorf	Pee Dee	
Dry Branch	-0.43615	0.050206	0.119512	•	-0.00987	0.484764	0.469709	
Blck Creek	0.050206	-0.45146	-0.38229	•	-0.51	-0.01786	-0.03182	
Congaree	0.119512	-0.38229	-0.43615	•	-0.44172	-0.0709	-0.08596	
McBean	•	•	•	•	•	•	•	
Tobacco Rd	-0.00987	-0.51	-0.44172	•	-0.56307	-0.08272	-0.08938	
Middendorf	0.484764	-0.01786	-0.0709	•	-0.08272	-0.34481	-0.36691	
Pee Dee	0.469709	-0.03182	-0.08596	•	-0.08938	-0.36691	-0.46851	

Positive values show pairs of means that are significantly different.

FIGURE 16c.

L-alanyl glycine By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.155463
RSquare Adj	0.105193
Root Mean Square Error	0.624334
Mean of Response	0.726944
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	6.027282	1.20546	3.0926
Error	84	32.742641	0.38979	Prob>F
C Total	89	38.769923		0.0130

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.60329	0.16686
Congaree	15	0.61787	0.16120
Dry Branch	15	1.24200	0.16120
McBean	0	.	.
Middendorf	24	0.61087	0.12744
Pee Dee	13	0.45954	0.17316
Tobacco Rd	9	0.93844	0.20811

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.624133	0.638714	.	0.303556	0.631125	0.782462
Congaree	-0.62413	0.000000	0.014581	.	-0.32058	0.006992	0.158328
Black Creek	-0.63871	-0.01458	0.000000	.	-0.33516	-0.00759	0.143747
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.30356	0.320578	0.335159	.	0.000000	0.327569	0.478906
Middendorf	-0.63113	-0.00699	0.007589	.	-0.32757	0.000000	0.151337
Pee Dee	-0.78246	-0.15833	-0.14375	.	-0.47891	-0.15134	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

1.98862							
Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.45335	0.170779	0.177335	.	-0.21993	0.222477	0.311993
Congaree	0.170779	-0.45335	-0.4468	.	-0.20291	-0.40166	-0.31214
Black Creek	0.177335	-0.4468	-0.46927	.	-0.19529	-0.40994	-0.33446
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.21993	-0.20291	-0.19529	.	-0.58528	-0.15772	-0.05947
Middendorf	0.222477	-0.40166	-0.40994	.	-0.15772	-0.35841	-0.27622
Pee Dee	0.311993	-0.31214	-0.33446	.	-0.05947	-0.27622	-0.48698

Positive values show pairs of means that are significantly different.

FIGURE 16d.

Oneway Anova**Summary of Fit**

RSquare	0.233837
RSquare Adj	0.188232
Root Mean Square Error	0.64731
Mean of Response	0.771589
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	10.742253	2.14845	5.1274
Error	84	35.196818	0.41901	Prob>F
C Total	89	45.939072		0.0004

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.49071	0.17300
Congaree	15	0.90200	0.16713
Dry Branch	15	1.29727	0.16713
McBean	0	.	.
Middendorf	24	0.47854	0.13213
Pee Dee	13	0.50938	0.17953
Tobacco Rd	9	1.27522	0.21577

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	0.000000	0.395267	0.806552	.	0.022044	0.787882	0.818725
Congaree	-0.39527	0.000000	0.411286	.	-0.37322	0.392615	0.423458
Black Creek	-0.80655	-0.41129	0.000000	.	-0.78451	-0.01867	0.012173
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.02204	0.373222	0.784508	.	0.000000	0.765838	0.796681
Pee Dee	-0.78788	-0.39262	0.018670	.	-0.76584	0.000000	0.030843
Middendorf	-0.81872	-0.42346	-0.01217	.	-0.79668	-0.03084	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	-0.47004	-0.07477	0.328195	.	-0.52071	0.300101	0.395039
Congaree	-0.07477	-0.47004	-0.06707	.	-0.16953	-0.09517	-0.00023
Black Creek	0.328195	-0.06707	-0.48654	.	0.234534	-0.47713	-0.42073
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.52071	-0.16953	0.234534	.	-0.60682	0.207648	0.293535
Pee Dee	0.300101	-0.09517	-0.47713	.	0.207648	-0.5049	-0.41245
Middendorf	0.395039	-0.00023	-0.42073	.	0.293535	-0.41245	-0.3716

Positive values show pairs of means that are significantly different.

FIGURE 16e.

Oneway Anova**Summary of Fit**

RSquare 0.141607
 RSquare Adj 0.090513
 Root Mean Square Error 0.701195
 Mean of Response 0.852311
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob>F
Model	5	6.813293	1.36266	2.7715	
Error	84	41.300633	0.49167		
C Total	89	48.113925			0.0229

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.72571	0.18740
Congaree	15	1.17280	0.18105
Dry Branch	15	1.19987	0.18105
McBean	0	.	.
Middendorf	24	0.57046	0.14313
Pee Dee	13	0.58815	0.19448
Tobacco Rd	9	1.06900	0.23373

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	0.000000	0.027067	0.474152	.	0.130867	0.611713	0.629408
Congaree	-0.02707	0.000000	0.447086	.	0.103800	0.584646	0.602342
Black Creek	-0.47415	-0.44709	0.000000	.	-0.34329	0.137560	0.155256
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.13087	-0.1038	0.343286	.	0.000000	0.480846	0.498542
Pee Dee	-0.61171	-0.58465	-0.13756	.	-0.48085	0.000000	0.017696
Middendorf	-0.62941	-0.60234	-0.15526	.	-0.49854	-0.0177	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	-0.50917	-0.4821	-0.04403	.	-0.45707	0.083326	0.170452
Congaree	-0.4821	-0.50917	-0.07109	.	-0.48413	0.056260	0.143386
Black Creek	-0.04403	-0.07109	-0.52704	.	-0.25247	-0.39952	-0.31368
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.45707	-0.48413	-0.25247	.	-0.65733	-0.12381	-0.04649
Pee Dee	0.083326	0.056260	-0.39952	.	-0.12381	-0.54693	-0.4625
Middendorf	0.170452	0.143386	-0.31368	.	-0.04649	-0.4625	-0.40253

Positive values show pairs of means that are significantly different.

FIGURE 16f.

L-glutamic acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.120381
RSquare Adj	0.068023
Root Mean Square Error	0.798969
Mean of Response	1.003289
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	7.338426	1.46769	2.2992
Error	84	53.621469	0.63835	Prob>F
C Total	89	60.959894		0.0521

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.79207	0.21353
Congaree	15	0.93633	0.20629
Dry Branch	15	1.46360	0.20629
McBean	0	.	.
Middendorf	24	0.79108	0.16309
Pee Dee	13	0.83923	0.22159
Tobacco Rd	9	1.47911	0.26632

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	0.000000	0.527267	0.671529	.	-0.01551	0.624369	0.672517
Congaree	-0.52727	0.000000	0.144262	.	-0.54278	0.097103	0.145250
Black Creek	-0.67153	-0.14426	0.000000	.	-0.68704	-0.04716	0.000988
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.015511	0.542778	0.687040	.	0.000000	0.639880	0.688028
Pee Dee	-0.62437	-0.0971	0.047159	.	-0.63988	0.000000	0.048147
Middendorf	-0.67252	-0.14525	-0.00099	.	-0.68803	-0.04815	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	-0.58016	-0.0529	0.081096	.	-0.6544	0.022305	0.149564
Congaree	-0.0529	-0.58016	-0.44617	.	-0.12714	-0.50496	-0.3777
Black Creek	0.081096	-0.44617	-0.60053	.	0.008212	-0.56481	-0.53333
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.6544	-0.12714	0.008212	.	-0.74899	-0.04909	0.067000
Pee Dee	0.022305	-0.50496	-0.56481	.	-0.04909	-0.6232	-0.499
Middendorf	0.149564	-0.3777	-0.53333	.	0.067000	-0.499	-0.45866

Positive values show pairs of means that are significantly different.

FIGURE 16g.

glycyl-L-aspartic acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.073625
RSquare Adj	0.018483
Root Mean Square Error	0.380665
Mean of Response	0.476211
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.967392	0.193478	1.3352
Error	84	12.172099	0.144906	Prob>F
C Total	89	13.139491		0.2574

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.476857	0.10174
Congaree	15	0.500733	0.09829
Dry Branch	15	0.652267	0.09829
McBean	0	.	.
Middendorf	24	0.405083	0.07770
Pee Dee	13	0.320462	0.10558
Tobacco Rd	9	0.555556	0.12689

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.151533	0.175410	.	0.096711	0.247183	0.331805
Congaree	-0.15153	0.000000	0.023876	.	-0.05482	0.095650	0.180272
Black Creek	-0.17541	-0.02388	0.000000	.	-0.0787	0.071774	0.156396
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.09671	0.054822	0.078698	.	0.000000	0.150472	0.235094
Middendorf	-0.24718	-0.09565	-0.07177	.	-0.15047	0.000000	0.084622
Pee Dee	-0.33181	-0.18027	-0.1564	.	-0.23509	-0.08462	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.27642	-0.12488	-0.1059	.	-0.22247	-0.00198	0.044954
Congaree	-0.12488	-0.27642	-0.25743	.	-0.26436	-0.15351	-0.10658
Black Creek	-0.1059	-0.25743	-0.28612	.	-0.24473	-0.1828	-0.13517
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.22247	-0.26436	-0.24473	.	-0.35685	-0.14541	-0.09316
Middendorf	-0.00198	-0.15351	-0.1828	.	-0.14541	-0.21853	-0.17606
Pee Dee	0.044954	-0.10658	-0.13517	.	-0.09316	-0.17606	-0.29692

Positive values show pairs of means that are significantly different.

FIGURE 16h.

glycyl-L-glutamic acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.187202
RSquare Adj	0.138821
Root Mean Square Error	0.60887
Mean of Response	0.747022
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	7.172237	1.43445	3.8693
Error	84	31.140685	0.37072	Prob>F
C Total	89	38.312922		0.0033

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.51579	0.16273
Congaree	15	0.72547	0.15721
Dry Branch	15	1.22167	0.15721
McBean	0	.	.
Middendorf	24	0.61408	0.12429
Pee Dee	13	0.44385	0.16887
Tobacco Rd	9	1.14400	0.20296

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.496200	0.705881	.	0.077667	0.607583	0.777821
Congaree	-0.4962	0.000000	0.209681	.	-0.41853	0.111383	0.281621
Blck Creek	-0.70588	-0.20968	0.000000	.	-0.62821	-0.0983	0.071940
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.07767	0.418533	0.628214	.	0.000000	0.529917	0.700154
Middendorf	-0.60758	-0.11138	0.098298	.	-0.52992	0.000000	0.170237
Pee Dee	-0.77782	-0.28162	-0.07194	.	-0.70015	-0.17024	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
1.98862							
Abs(Dif)-LSD							
Dry Branch	-0.44213	0.054075	0.255930	.	-0.43286	0.209057	0.319006
Congaree	0.054075	-0.44213	-0.24027	.	-0.09199	-0.28714	-0.17719
Blck Creek	0.255930	-0.24027	-0.45764	.	0.110900	-0.30889	-0.39442
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.43286	-0.09199	0.110900	.	-0.57078	0.056650	0.175112
Middendorf	0.209057	-0.28714	-0.30889	.	0.056650	-0.34953	-0.24673
Pee Dee	0.319006	-0.17719	-0.39442	.	0.175112	-0.24673	-0.47492

Positive values show pairs of means that are significantly different.

FIGURE 16i.

L-histidine By Aquifers **Oneway Anova****Summary of Fit**

RSquare 0.207881
 RSquare Adj 0.160731
 Root Mean Square Error 0.568141
 Mean of Response 0.711489
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob>F
Model	5	7.115669	1.42313	4.4089	
Error	84	27.113834	0.32278		
C Total	89	34.229502			0.0013

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.65236	0.15184
Congaree	15	0.82267	0.14669
Dry Branch	15	1.10300	0.14669
McBean	0	.	.
Middendorf	24	0.52917	0.11597
Pee Dee	13	0.27169	0.15757
Tobacco Rd	9	1.08711	0.18938

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.280333	0.450643	.	0.015889	0.573833	0.831308
Congaree	-0.28033	0.000000	0.170310	.	-0.26444	0.293500	0.550974
Black Creek	-0.45064	-0.17031	0.000000	.	-0.43475	0.123190	0.380665
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.01589	0.264444	0.434754	.	0.000000	0.557944	0.815419
Middendorf	-0.57383	-0.2935	-0.12319	.	-0.55794	0.000000	0.257474
Pee Dee	-0.83131	-0.55097	-0.38066	.	-0.81542	-0.25747	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.41255	-0.13222	0.030791	.	-0.46048	0.201966	0.403184
Congaree	-0.13222	-0.41255	-0.24954	.	-0.21193	-0.07837	0.122851
Black Creek	0.030791	-0.24954	-0.42703	.	-0.04796	-0.25676	-0.0545
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.46048	-0.21193	-0.04796	.	-0.5326	0.116336	0.325498
Middendorf	0.201966	-0.07837	-0.25676	.	0.116336	-0.32615	-0.1316
Pee Dee	0.403184	0.122851	-0.0545	.	0.325498	-0.1316	-0.44315

Positive values show pairs of means that are significantly different.

FIGURE 16j.

hydroxy L-proline By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.135472
RSquare Adj	0.084012
Root Mean Square Error	0.668489
Mean of Response	0.661967
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	.5	5.882178	1.17644	2.6326
Error	84	37.537675	0.44688	Prob>F
C Total	89	43.419853		0.0292

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.53679	0.17866
Congaree	15	0.83073	0.17260
Dry Branch	15	1.01813	0.17260
McBean	0	.	.
Middendorf	24	0.50662	0.13645
Pee Dee	13	0.27308	0.18541
Tobacco Rd	9	0.95778	0.22283

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.187400	0.481348	.	0.060356	0.511508	0.745056
Congaree	-0.1874	0.000000	0.293948	.	-0.12704	0.324108	0.557656
Black Creek	-0.48135	-0.29395	0.000000	.	-0.42099	0.030161	0.263709
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.06036	0.127044	0.420992	.	0.000000	0.451153	0.684701
Middendorf	-0.51151	-0.32411	-0.03016	.	-0.45115	0.000000	0.233548
Pee Dee	-0.74506	-0.55766	-0.26371	.	-0.6847	-0.23355	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.48542	-0.29802	-0.01266	.	-0.50016	0.073960	0.241316
Congaree	-0.29802	-0.48542	-0.20006	.	-0.43347	-0.11344	0.053916
Black Creek	-0.01266	-0.20006	-0.50245	.	-0.14698	-0.4169	-0.24832
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.50016	-0.43347	-0.14698	.	-0.62667	-0.06845	0.108248
Middendorf	0.073960	-0.11344	-0.4169	.	-0.06845	-0.38376	-0.22424
Pee Dee	0.241316	0.053916	-0.24832	.	0.108248	-0.22424	-0.52142

Positive values show pairs of means that are significantly different.

FIGURE 16k.

L-leucine By Aquifers **Oneway Anova****Summary of Fit**

RSquare 0.210132
 RSquare Adj 0.163116
 Root Mean Square Error 0.814308
 Mean of Response 0.9557
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	14.818189	2.96364	4.4694
Error	84	55.700160	0.66310	Prob>F
C Total	89	70.518349		0.0012

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.78400	0.21763
Congaree	15	1.31553	0.21025
Dry Branch	15	1.61627	0.21025
McBean	0	.	.
Middendorf	24	0.71854	0.16622
Pee Dee	13	0.36454	0.22585
Tobacco Rd	9	1.00844	0.27144

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.00000	0.30073	0.83227	.	0.60782	0.89773	1.25173
Congaree	-0.30073	0.00000	0.53153	.	0.30709	0.59699	0.95099
Black Creek	-0.83227	-0.53153	0.00000	.	-0.22444	0.06546	0.41946
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.60782	-0.30709	0.22444	.	0.00000	0.28990	0.64391
Middendorf	-0.89773	-0.59699	-0.06546	.	-0.28990	0.00000	0.35400
Pee Dee	-1.25173	-0.95099	-0.41946	.	-0.64391	-0.35400	0.00000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.5913	-0.29057	0.230498	.	-0.07495	0.364733	0.638105
Congaree	-0.29057	-0.5913	-0.07023	.	-0.37569	0.063999	0.337372
Black Creek	0.230498	-0.07023	-0.61206	.	-0.46742	-0.47912	-0.20425
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.07495	-0.37569	-0.46742	.	-0.76337	-0.34305	-0.05829
Middendorf	0.364733	0.063999	-0.47912	.	-0.34305	-0.46747	-0.20365
Pee Dee	0.638105	0.337372	-0.20425	.	-0.05829	-0.20365	-0.63516

Positive values show pairs of means that are significantly different.

FIGURE 161.

L-ornithine By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.133373
RSquare Adj	0.081788
Root Mean Square Error	0.496646
Mean of Response	0.608644
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	3.188660	0.637732	2.5855
Error	84	20.719247	0.246658	Prob>F
C Total	89	23.907907		0.0317

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.559786	0.13273
Congaree	15	0.741800	0.12823
Dry Branch	15	0.918600	0.12823
McBean	0	.	.
Middendorf	24	0.557833	0.10138
Pee Dee	13	0.286077	0.13774
Tobacco Rd	9	0.547556	0.16555

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Middendorf	Tobacco Rd	Pee Dee
Dry Branch	0.000000	0.176800	0.358814	.	0.360767	0.371044	0.632523
Congaree	-0.1768	0.000000	0.182014	.	0.183967	0.194244	0.455723
Black Creek	-0.35881	-0.18201	0.000000	.	0.001952	0.012230	0.273709
McBean	.	.	.	.	.	.	.
Middendorf	-0.36077	-0.18397	-0.00195	.	0.000000	0.010278	0.271756
Tobacco Rd	-0.37104	-0.19424	-0.01223	.	-0.01028	0.000000	0.261479
Pee Dee	-0.63252	-0.45572	-0.27371	.	-0.27176	-0.26148	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Middendorf	Tobacco Rd	Pee Dee
Dry Branch	-0.36064	-0.18384	-0.0082	.	0.035695	-0.04538	0.258274
Congaree	-0.18384	-0.36064	-0.185	.	-0.14111	-0.22218	0.081474
Black Creek	-0.0082	-0.185	-0.37329	.	-0.33019	-0.40974	-0.1067
McBean	.	.	.	.	.	.	.
Middendorf	0.035695	-0.14111	-0.33019	.	-0.28511	-0.37576	-0.06836
Tobacco Rd	-0.04538	-0.22218	-0.40974	.	-0.37576	-0.46558	-0.16679
Pee Dee	0.258274	0.081474	-0.1067	.	-0.06836	-0.16679	-0.38738

Positive values show pairs of means that are significantly different.

FIGURE 16m.

L-phenylalanine By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.135
RSquare Adj	0.083512
Root Mean Square Error	0.774092
Mean of Response	0.815089
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	7.855638	1.57113	2.6220
Error	84	50.334325	0.59922	Prob>F
C Total	89	58.189963		0.0298

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.62979	0.20688
Congaree	15	0.94607	0.19987
Dry Branch	15	1.15247	0.19987
McBean	0	.	.
Middendorf	24	0.71629	0.15801
Pee Dee	13	0.32546	0.21469
Tobacco Rd	9	1.29344	0.25803

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.206400	0.522681	.	-0.14098	0.436175	0.827005
Congaree	-0.2064	0.000000	0.316281	.	-0.34738	0.229775	0.620605
Blck Creek	-0.52268	-0.31628	0.000000	.	-0.66366	-0.08651	0.304324
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.140978	0.347378	0.663659	.	0.000000	0.577153	0.967983
Middendorf	-0.43617	-0.22977	0.086506	.	-0.57715	0.000000	0.390830
Pee Dee	-0.82701	-0.62061	-0.30432	.	-0.96798	-0.39083	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.5621	-0.3557	-0.04937	.	-0.50808	-0.07049	0.243687
Congaree	-0.3557	-0.5621	-0.25577	.	-0.30168	-0.27689	0.037287
Blck Creek	-0.04937	-0.25577	-0.58183	.	0.005967	-0.43118	-0.28859
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.50808	-0.30168	0.005967	.	-0.72567	-0.02454	0.300466
Middendorf	-0.07049	-0.27689	-0.43118	.	-0.02454	-0.44438	-0.13928
Pee Dee	0.243687	0.037287	-0.28859	.	0.300466	-0.13928	-0.60379

Positive values show pairs of means that are significantly different.

FIGURE 16n.

L-proline By Aquifers **Oneway Anova****Summary of Fit**

RSquare	0.101704
RSquare Adj	0.048234
Root Mean Square Error	0.913878
Mean of Response	0.908822
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	7.942770	1.58855	1.9021
Error	84	70.154493	0.83517	Prob>F
C Total	89	78.097263		0.1026

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.90857	0.24424
Congaree	15	1.07727	0.23596
Dry Branch	15	1.33647	0.23596
McBean	0	.	.
Middendorf	24	0.67038	0.18654
Pee Dee	13	0.45854	0.25346
Tobacco Rd	9	1.20200	0.30463

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.259200	0.427895	.	0.134467	0.666092	0.877928
Congaree	-0.2592	0.000000	0.168695	.	-0.12473	0.406892	0.618728
Black Creek	-0.4279	-0.1687	0.000000	.	-0.29343	0.238196	0.450033
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.13447	0.124733	0.293429	.	0.000000	0.531625	0.743462
Middendorf	-0.66609	-0.40689	-0.2382	.	-0.53162	0.000000	0.211837
Pee Dee	-0.87793	-0.61873	-0.45003	.	-0.74346	-0.21184	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.6636	-0.4044	-0.24745	.	-0.6318	0.067927	0.189274
Congaree	-0.4044	-0.6636	-0.50665	.	-0.64153	-0.19127	-0.06993
Black Creek	-0.24745	-0.50665	-0.6869	.	-0.48303	-0.37297	-0.24995
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.6318	-0.64153	-0.48303	.	-0.85671	-0.17872	-0.0446
Middendorf	0.067927	-0.19127	-0.37297	.	-0.17872	-0.52462	-0.414
Pee Dee	0.189274	-0.06993	-0.24995	.	-0.0446	-0.414	-0.71282

Positive values show pairs of means that are significantly different.

FIGURE 16o.

Oneway Anova

Summary of Fit

RSquare	0.184132
RSquare Adj	0.135569
Root Mean Square Error	0.641547
Mean of Response	0.767278
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	7.802711	1.56054	3.7916
Error	84	34.572881	0.41158	Prob>F
C Total	89	42.375592		0.0038

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.72836	0.17146
Congaree	15	0.85160	0.16565
Dry Branch	15	1.27153	0.16565
McBean	0	.	.
Middendorf	24	0.62412	0.13096
Pee Dee	13	0.27785	0.17793
Tobacco Rd	9	0.93556	0.21385

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.419933	0.543176	.	0.335978	0.647408	0.993687
Congaree	-0.41993	0.000000	0.123243	.	-0.08396	0.227475	0.573754
Black Creek	-0.54318	-0.12324	0.000000	.	-0.2072	0.104232	0.450511
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.33598	0.083956	0.207198	.	0.000000	0.311431	0.657709
Middendorf	-0.64741	-0.22748	-0.10423	.	-0.31143	0.000000	0.346279
Pee Dee	-0.99369	-0.57375	-0.45051	.	-0.65771	-0.34628	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.46585	-0.04592	0.069077	.	-0.20194	0.227494	0.510249
Congaree	-0.04592	-0.46585	-0.35086	.	-0.45397	-0.19244	0.090315
Black Creek	0.069077	-0.35086	-0.4822	.	-0.33788	-0.32481	-0.04088
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.20194	-0.45397	-0.33788	.	-0.60141	-0.18724	0.104489
Middendorf	0.227494	-0.19244	-0.32481	.	-0.18724	-0.36829	-0.09306
Pee Dee	0.510249	0.090315	-0.04088	.	0.104489	-0.09306	-0.50041

Positive values show pairs of means that are significantly different.

FIGURE 16p.

D-serine By Aquifers **Oneway Anova****Summary of Fit**

RSquare	0.189569
RSquare Adj	0.141329
Root Mean Square Error	0.195038
Mean of Response	0.327822
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.7474269	0.149485	3.9297
Error	84	3.1953503	0.038040	Prob>F
C Total	89	3.9427772		0.0030

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.293214	0.05213
Congaree	15	0.337333	0.05036
Dry Branch	15	0.244533	0.05036
McBean	0	.	.
Middendorf	24	0.468792	0.03981
Pee Dee	13	0.254923	0.05409
Tobacco Rd	9	0.234000	0.06501

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Middendorf	Black Creek	Pee Dee	McBean	Congaree	Dry Branch	Tobacco Rd
Middendorf	0.000000	0.175577	0.213869	.	0.131458	0.224258	0.234792
Black Creek	-0.17558	0.000000	0.038291	.	-0.04412	0.048681	0.059214
Pee Dee	-0.21387	-0.03829	0.000000	.	-0.08241	0.010390	0.020923
McBean	.	.	.	.	.	.	.
Congaree	-0.13146	0.044119	0.082410	.	0.000000	0.092800	0.103333
Dry Branch	-0.22426	-0.04868	-0.01039	.	-0.0928	0.000000	0.010533
Tobacco Rd	-0.23479	-0.05921	-0.02092	.	-0.10333	-0.01053	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	t						
1.98862							
Abs(Dif)-LSD	Middendorf	Black Creek	Pee Dee	McBean	Congaree	Dry Branch	Tobacco Rd
Middendorf	-0.11196	0.045143	0.080303	.	0.003799	0.096599	0.083191
Black Creek	0.045143	-0.1466	-0.1111	.	-0.10001	-0.09545	-0.1065
Pee Dee	0.080303	-0.1111	-0.15213	.	-0.06456	-0.13658	-0.14726
McBean	.	.	.	.	.	.	.
Congaree	0.003799	-0.10001	-0.06456	.	-0.14163	-0.04883	-0.0602
Dry Branch	0.096599	-0.09545	-0.13658	.	-0.04883	-0.14163	-0.153
Tobacco Rd	0.083191	-0.1065	-0.14726	.	-0.0602	-0.153	-0.18284

Positive values show pairs of means that are significantly different.

FIGURE 16q.

L-serine By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.229582
RSquare Adj	0.183724
Root Mean Square Error	0.653285
Mean of Response	0.722478
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	10.683078	2.13662	5.0064
Error	84	35.849596	0.42678	Prob>F
C Total	89	46.532674		0.0005

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.43671	0.17460
Congaree	15	1.00380	0.16868
Dry Branch	15	1.19647	0.16868
McBean	0	.	.
Middendorf	24	0.50017	0.13335
Pee Dee	13	0.29454	0.18119
Tobacco Rd	9	1.11911	0.21776

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.192667	0.759752	.	0.077356	0.696300	0.901928
Congaree	-0.19267	0.000000	0.567086	.	-0.11531	0.503633	0.709262
Black Creek	-0.75975	-0.56709	0.000000	.	-0.6824	-0.06345	0.142176
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.07736	0.115311	0.682397	.	0.000000	0.618944	0.824573
Middendorf	-0.6963	-0.50363	0.063452	.	-0.61894	0.000000	0.205628
Pee Dee	-0.90193	-0.70926	-0.14218	.	-0.82457	-0.20563	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

1.98862							
Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.47438	-0.28171	0.276979	.	-0.47041	0.268703	0.409644
Congaree	-0.28171	-0.47438	0.084312	.	-0.43245	0.076036	0.216978
Black Creek	0.276979	0.084312	-0.49103	.	0.127346	-0.37344	-0.3582
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.47041	-0.43245	0.127346	.	-0.61242	0.111155	0.261230
Middendorf	0.268703	0.076036	-0.37344	.	0.111155	-0.37503	-0.24175
Pee Dee	0.409644	0.216978	-0.3582	.	0.261230	-0.24175	-0.50956

Positive values show pairs of means that are significantly different.

FIGURE 16r.

L-threonine By Aquifers

Oneway Anova

Summary of Fit

RSquare 0.180547
 RSquare Adj 0.13177
 Root Mean Square Error 0.662035
 Mean of Response 0.699178
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	8.111643	1.62233	3.7015
Error	84	36.816434	0.43829	Prob>F
C Total	89	44.928077		0.0045

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.51864	0.17694
Congaree	15	0.67533	0.17094
Dry Branch	15	1.13460	0.17094
McBean	0	.	.
Middendorf	24	0.58604	0.13514
Pee Dee	13	0.28238	0.18362
Tobacco Rd	9	1.19778	0.22068

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.459267	0.615957	.	-0.06318	0.548558	0.852215
Congaree	-0.45927	0.000000	0.156690	.	-0.52244	0.089292	0.392949
Blck Creek	-0.61596	-0.15669	0.000000	.	-0.67913	-0.0674	0.236258
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.063178	0.522444	0.679135	.	0.000000	0.611736	0.915393
Middendorf	-0.54856	-0.08929	0.067399	.	-0.61174	0.000000	0.303657
Pee Dee	-0.85222	-0.39295	-0.23626	.	-0.91539	-0.30366	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

t	1.98862						
Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.48073	-0.02146	0.126717	.	-0.49192	0.115233	0.353337
Congaree	-0.02146	-0.48073	-0.33255	.	-0.03266	-0.34403	-0.10593
Blck Creek	0.126717	-0.33255	-0.4976	.	0.116650	-0.37535	-0.27082
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.49192	-0.03266	0.116650	.	-0.62062	0.097145	0.344505
Middendorf	0.115233	-0.34403	-0.37535	.	0.097145	-0.38005	-0.14972
Pee Dee	0.353337	-0.10593	-0.27082	.	0.344505	-0.14972	-0.51639

Positive values show pairs of means that are significantly different.

FIGURE 16s.

"D,L-carnitine" By Aquifers **Oneway Anova****Summary of Fit**

RSquare 0.147998
 RSquare Adj 0.097284
 Root Mean Square Error 0.55574
 Mean of Response 0.528967
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	4.506503	0.901301	2.9183
Error	84	25.943156	0.308847	Prob>F
C Total	89	30.449659		0.0177

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.296786	0.14853
Congaree	15	0.383000	0.14349
Dry Branch	15	0.876000	0.14349
McBean	0	.	.
Middendorf	24	0.580458	0.11344
Pee Dee	13	0.265000	0.15413
Tobacco Rd	9	0.799000	0.18525

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Middendorf	Blck Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	0.000000	0.295542	0.579214	.	0.077000	0.493000	0.611000
Middendorf	-0.29554	0.000000	0.283673	.	-0.21854	0.197458	0.315458
Blck Creek	-0.57921	-0.28367	0.000000	.	-0.50221	-0.08621	0.031786
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.077	0.218542	0.502214	.	0.000000	0.416000	0.534000
Congaree	-0.493	-0.19746	0.086214	.	-0.416	0.000000	0.118000
Pee Dee	-0.611	-0.31546	-0.03179	.	-0.534	-0.118	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Middendorf	Blck Creek	McBean	Tobacco Rd	Congaree	Pee Dee
Dry Branch	-0.40355	-0.06821	0.168526	.	-0.38897	0.089455	0.192221
Middendorf	-0.06821	-0.31903	-0.08799	.	-0.21343	-0.16629	-0.06512
Blck Creek	0.168526	-0.08799	-0.41771	.	0.030041	-0.32447	-0.39388
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.38897	-0.21343	0.030041	.	-0.52097	-0.04997	0.054773
Congaree	0.089455	-0.16629	-0.32447	.	-0.04997	-0.40355	-0.30078
Pee Dee	0.192221	-0.06512	-0.39388	.	0.054773	-0.30078	-0.43348

Positive values show pairs of means that are significantly different.

FIGURE 16t.

gamma-amino butyric acid By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.193427
RSquare Adj	0.145417
Root Mean Square Error	0.633132
Mean of Response	0.763933
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	8.074989	1.61500	4.0289
Error	84	33.671930	0.40086	Prob>F
C Total	89	41.746920		0.0025

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.72314	0.16921
Congaree	15	0.94093	0.16347
Dry Branch	15	1.28273	0.16347
McBean	0	.	.
Middendorf	24	0.54154	0.12924
Pee Dee	13	0.34631	0.17560
Tobacco Rd	9	0.86400	0.21104

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.341800	0.559590	.	0.418733	0.741192	0.936426
Congaree	-0.3418	0.000000	0.217790	.	0.076933	0.399392	0.594626
Black Creek	-0.55959	-0.21779	0.000000	.	-0.14086	0.181601	0.376835
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.41873	-0.07693	0.140857	.	0.000000	0.322458	0.517692
Middendorf	-0.74119	-0.39939	-0.1816	.	-0.32246	0.000000	0.195234
Pee Dee	-0.93643	-0.59463	-0.37684	.	-0.51769	-0.19523	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.45974	-0.11794	0.091710	.	-0.11213	0.326785	0.459328
Congaree	-0.11794	-0.45974	-0.25009	.	-0.45393	-0.01502	0.117528
Black Creek	0.091710	-0.25009	-0.47588	.	-0.39707	-0.24182	-0.10811
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.11213	-0.45393	-0.39707	.	-0.59353	-0.16967	-0.02827
Middendorf	0.326785	-0.01502	-0.24182	.	-0.16967	-0.36346	-0.23835
Pee Dee	0.459328	0.117528	-0.10811	.	-0.02827	-0.23835	-0.49384

Positive values show pairs of means that are significantly different.

FIGURE 17.

aromatics By Aquifers

Oneway Anova

Summary of Fit

R Square	0.067388
R Square Adj	0.054216
Root Mean Square Error	0.521721
Mean of Response	0.548683
Observations (or Sum Wgts)	360

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	6.96246	1.39249	5.1158
Error	354	96.35621	0.27219	Prob>F
C Total	359	103.31867		0.0002

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	56	0.482911	0.06972
Congaree	60	0.644800	0.06735
Dry Branch	60	0.680550	0.06735
McBean	0	.	.
Middendorf	96	0.464917	0.05325
Pee Dee	52	-0.340308	0.07235
Tobacco Rd	36	0.795389	0.08695

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.035750	0.197639	.	-0.11484	0.215633	0.340242
Congaree	-0.03575	0.000000	0.161889	.	-0.15059	0.179883	0.304492
Black Creek	-0.19764	-0.16189	0.000000	.	-0.31248	0.017994	0.142603
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.114839	0.150589	0.312478	.	0.000000	0.330472	0.455081
Middendorf	-0.21563	-0.17988	-0.01799	.	-0.33047	0.000000	0.124609
Pee Dee	-0.34024	-0.30449	-0.1426	.	-0.45508	-0.12461	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

1.96672							
Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.18734	-0.15159	0.006988	•	-0.10148	0.046772	0.145835
Congaree	-0.15159	-0.18734	-0.02876	•	-0.06573	0.011022	0.110085
Blck Creek	0.006988	-0.02876	-0.19391	•	0.093284	-0.15454	-0.055
McBean	•	•	•	•	•	•	•
Tobacco Rd	-0.10148	-0.06573	0.093284	•	-0.24185	0.129942	0.232613
Middendorf	0.046772	0.011022	-0.15454	•	0.129942	-0.1481	-0.05207
Pee Dee	0.145835	0.110085	-0.055	•	0.232613	-0.05207	-0.20123

Positive values show pairs of means that are significantly different.

FIGURE 17a.

inosine By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.153707
RSquare Adj	0.103332
Root Mean Square Error	0.460595
Mean of Response	0.562789
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	3.236611	0.647322	3.0513
Error	84	17.820438	0.212148	Prob>F
C Total	89	21.057049		0.0140

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.390357	0.12310
Congaree	15	0.704467	0.11893
Dry Branch	15	0.628867	0.11893
McBean	0	.	.
Middendorf	24	0.537708	0.09402
Pee Dee	13	0.281231	0.12775
Tobacco Rd	9	0.958333	0.15353

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Congaree	Dry Branch	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	0.000000	0.075600	0.314110	.	-0.25387	0.166758	0.423236
Dry Branch	-0.0756	0.000000	0.238510	.	-0.32947	0.091158	0.347636
Black Creek	-0.31411	-0.23851	0.000000	.	-0.56798	-0.14735	0.109126
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.253867	0.329467	0.567976	.	0.000000	0.420625	0.677103
Middendorf	-0.16676	-0.09116	0.147351	.	-0.42063	0.000000	0.256478
Pee Dee	-0.42324	-0.34764	-0.10913	.	-0.6771	-0.25648	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Congaree	Dry Branch	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	-0.33446	-0.25886	-0.02627	.	-0.13233	-0.13472	0.076153
Dry Branch	-0.25886	-0.33446	-0.10187	.	-0.05673	-0.21032	0.000553
Black Creek	-0.02627	-0.10187	-0.3462	.	0.176640	-0.16068	-0.24366
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.13233	-0.05673	0.176640	.	-0.43178	0.062610	0.279921
Middendorf	-0.13472	-0.21032	-0.16068	.	0.062610	-0.26441	-0.05895
Pee Dee	0.076153	0.000553	-0.24366	.	0.279921	-0.05895	-0.35926

Positive values show pairs of means that are significantly different.

FIGURE 17b.

Oneway Anova**Summary of Fit**

RSquare 0.162356
 RSquare Adj 0.112497
 Root Mean Square Error 0.696969
 Mean of Response 0.8275
 Observations (or Sum Wgts) 90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio	Prob>F
Model	5	7.908918	1.58178	3.2563	
Error	84	40.804367	0.48577		
C Total	89	48.713285			0.0098

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.93271	0.18627
Congaree	15	0.94827	0.17996
Dry Branch	15	1.18567	0.17996
McBean	0	.	.
Middendorf	24	0.56629	0.14227
Pee Dee	13	0.37708	0.19330
Tobacco Rd	9	1.21278	0.23232

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.237400	0.252952	.	-0.02711	0.619375	0.808590
Congaree	-0.2374	0.000000	0.015552	.	-0.26451	0.381975	0.571190
Black Creek	-0.25295	-0.01555	0.000000	.	-0.28006	0.366423	0.555637
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.027111	0.264511	0.280063	.	0.000000	0.646486	0.835701
Middendorf	-0.61937	-0.38197	-0.36642	.	-0.64649	0.000000	0.189215
Pee Dee	-0.80859	-0.57119	-0.55564	.	-0.8357	-0.18921	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.5061	-0.2687	-0.2621	.	-0.55728	0.163185	0.283387
Congaree	-0.2687	-0.5061	-0.4995	.	-0.31988	-0.07422	0.045987
Black Creek	-0.2621	-0.4995	-0.52386	.	-0.3121	-0.09969	0.021797
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.55728	-0.31988	-0.3121	.	-0.65337	0.104741	0.234688
Middendorf	0.163185	-0.07422	-0.09969	.	0.104741	-0.40011	-0.28808
Pee Dee	0.283387	0.045987	0.021797	.	0.234688	-0.28808	-0.54364

Positive values show pairs of means that are significantly different.

inosine By Aquifers

FIGURE 17c.

Oneway Anova

Summary of Fit

RSquare	0.086574
RSquare Adj	0.032203
Root Mean Square Error	0.249008
Mean of Response	0.349967
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.4936515	0.098730	1.5923
Error	84	5.2084374	0.062005	Prob>F
C Total	89	5.7020889		0.1711

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.295143	0.06655
Congaree	15	0.455333	0.06429
Dry Branch	15	0.283400	0.06429
McBean	0	.	.
Middendorf	24	0.353000	0.05083
Pee Dee	13	0.272308	0.06906
Tobacco Rd	9	0.474667	0.08300

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Congaree	Black Creek	Dry Branch	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	0.000000	0.160190	0.171933	.	-0.01933	0.102333	0.183026
Black Creek	-0.16019	0.000000	0.011743	.	-0.17952	-0.05786	0.022835
Dry Branch	-0.17193	-0.01174	0.000000	.	-0.19127	-0.0696	0.011092
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.019333	0.179524	0.191267	.	0.000000	0.121667	0.202359
Middendorf	-0.10233	0.057857	0.069600	.	-0.12167	0.000000	0.080692
Pee Dee	-0.18303	-0.02284	-0.01109	.	-0.20236	-0.08069	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Congaree	Black Creek	Dry Branch	McBean	Tobacco Rd	Middendorf	Pee Dee
Congaree	-0.18082	-0.02383	-0.00888	.	-0.18945	-0.06065	-0.00462
Black Creek	-0.02383	-0.18716	-0.17227	.	-0.03204	-0.10867	-0.16789
Dry Branch	-0.00888	-0.17227	-0.18082	.	-0.01752	-0.09338	-0.17655
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.18945	-0.03204	-0.01752	.	-0.23343	-0.07188	-0.01237
Middendorf	-0.06065	-0.10867	-0.09338	.	-0.07188	-0.14295	-0.08983
Pee Dee	-0.00462	-0.16789	-0.17655	.	-0.01237	-0.08983	-0.19423

Positive values show pairs of means that are significantly different.

FIGURE 17d.

uridine By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.051363
RSquare Adj	-0.0051
Root Mean Square Error	0.431398
Mean of Response	0.454478
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.846428	0.169286	0.9096
Error	84	15.632756	0.186104	Prob>F
C Total	89	16.479184		0.4789

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.313429	0.11530
Congaree	15	0.471133	0.11139
Dry Branch	15	0.624267	0.11139
McBean	0	.	.
Middendorf	24	0.402667	0.08806
Pee Dee	13	0.430615	0.11965
Tobacco Rd	9	0.535778	0.14380

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	0.000000	0.153133	0.310838	.	0.088489	0.193651	0.221600
Congaree	-0.15313	0.000000	0.157705	.	-0.06464	0.040518	0.068467
Blck Creek	-0.31084	-0.1577	0.000000	.	-0.22235	-0.11719	-0.08924
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.08849	0.064644	0.222349	.	0.000000	0.105162	0.133111
Pee Dee	-0.19365	-0.04052	0.117187	.	-0.10516	0.000000	0.027949
Middendorf	-0.2216	-0.06847	0.089238	.	-0.13311	-0.02795	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	-0.31326	-0.16012	-0.00796	.	-0.27323	-0.13143	-0.06076
Congaree	-0.16012	-0.31326	-0.1611	.	-0.29707	-0.28456	-0.2139
Blck Creek	-0.00796	-0.1611	-0.32425	.	-0.14418	-0.21324	-0.19927
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.27323	-0.29707	-0.14418	.	-0.40441	-0.26684	-0.20221
Pee Dee	-0.13143	-0.28456	-0.21324	.	-0.26684	-0.33649	-0.26748
Middendorf	-0.06076	-0.2139	-0.19927	.	-0.20221	-0.26748	-0.24765

Positive values show pairs of means that are significantly different.

FIGURE 18.

Oneway Anova

Summary of Fit

RSquare	0.103878
RSquare Adj	0.050537
Root Mean Square Error	0.325754
Mean of Response	0.515833
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	1.0332757	0.206655	1.9474
Error	84	8.9137388	0.106116	Prob>F
C Total	89	9.9470145		0.0950

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.527357	0.08706
Congaree	15	0.508600	0.08411
Dry Branch	15	0.621667	0.08411
McBean	0	.	.
Middendorf	24	0.381333	0.06649
Pee Dee	13	0.488615	0.09035
Tobacco Rd	9	0.731556	0.10858

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	0.000000	0.094310	0.113067	.	-0.10989	0.133051	0.240333
Black Creek	-0.09431	0.000000	0.018757	.	-0.2042	0.038742	0.146024
Congaree	-0.11307	-0.01876	0.000000	.	-0.22296	0.019985	0.127267
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.109889	0.204198	0.222956	.	0.000000	0.242940	0.350222
Pee Dee	-0.13305	-0.03874	-0.01998	.	-0.24294	0.000000	0.107282
Middendorf	-0.24033	-0.14602	-0.12727	.	-0.35022	-0.10728	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Black Creek	Congaree	McBean	Tobacco Rd	Pee Dee	Middendorf
Dry Branch	-0.23654	-0.14642	-0.12348	.	-0.16325	-0.11242	0.027116
Black Creek	-0.14642	-0.24485	-0.22197	.	-0.07257	-0.21077	-0.07183
Congaree	-0.12348	-0.22197	-0.23654	.	-0.05018	-0.22549	-0.08595
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.16325	-0.07257	-0.05018	.	-0.30538	-0.03797	0.097018
Pee Dee	-0.11242	-0.21077	-0.22549	.	-0.03797	-0.25409	-0.1158
Middendorf	0.027116	-0.07183	-0.08595	.	0.097018	-0.1158	-0.187

Positive values show pairs of means that are significantly different.

FIGURE 19.

amines By Aquifers

Oneway Anova

Summary of Fit

RSquare 0.047232
 RSquare Adj 0.029187
 Root Mean Square Error 0.439088
 Mean of Response 0.434626
 Observations (or Sum Wgts) 270

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	2.523217	0.504643	2.6175
Error	264	50.898722	0.192798	Prob>F
C Total	269	53.421939		0.0249

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	42	0.366690	0.06775
Congaree	45	0.526467	0.06546
Dry Branch	45	0.568556	0.06546
McBean	0	.	.
Middendorf	72	0.387375	0.05175
Pee Dee	39	0.286718	0.07031
Tobacco Rd	27	0.503667	0.08450

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.042089	0.201865	.	0.064889	0.181181	0.281838
Congaree	-0.04209	0.000000	0.159776	.	0.022800	0.139092	0.239749
Blck Creek	-0.20187	-0.15978	0.000000	.	-0.13698	-0.02068	0.079973
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.06489	-0.0228	0.136976	.	0.000000	0.116292	0.216949
Middendorf	-0.18118	-0.13909	0.020685	.	-0.11629	0.000000	0.100657
Pee Dee	-0.28184	-0.23975	-0.07997	.	-0.21695	-0.10066	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.18227	-0.14018	0.016371	.	-0.14558	0.016887	0.092690
Congaree	-0.14018	-0.18227	-0.02572	.	-0.18766	-0.0252	0.050601
Blck Creek	0.016371	-0.02572	-0.18866	.	-0.07629	-0.14718	-0.11229
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.14558	-0.18766	-0.07629	.	-0.23531	-0.07881	0.000498
Middendorf	0.016887	-0.0252	-0.14718	.	-0.07881	-0.1441	-0.07124
Pee Dee	0.092690	0.050601	-0.11229	.	0.000498	-0.07124	-0.19579

Positive values show pairs of means that are significantly different.

FIGURE 19a.

phenylethylamine By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.046606
RSquare Adj	-0.01014
Root Mean Square Error	0.428675
Mean of Response	0.335267
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.754584	0.150917	0.8213
Error	84	15.435999	0.183762	Prob>F
C Total	89	16.190584		0.5380

Means for Oneway Anova

Level	Number	Mean	Std Error
Black Creek	14	0.236500	0.11457
Congaree	15	0.379933	0.11068
Dry Branch	15	0.419600	0.11068
McBean	0	.	.
Middendorf	24	0.304000	0.08750
Pee Dee	13	0.224462	0.11889
Tobacco Rd	9	0.517333	0.14289

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.039667	0.183100	.	-0.09773	0.115600	0.195138
Congaree	-0.03967	0.000000	0.143433	.	-0.1374	0.075933	0.155472
Black Creek	-0.1831	-0.14343	0.000000	.	-0.28083	-0.0675	0.012038
McBean	.	.	.	.	.	.	.
Tobacco Rd	0.097733	0.137400	0.280833	.	0.000000	0.213333	0.292872
Middendorf	-0.1156	-0.07593	0.067500	.	-0.21333	0.000000	0.079538
Pee Dee	-0.19514	-0.15547	-0.01204	.	-0.29287	-0.07954	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	Dry Branch	Congaree	Black Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
1.98862							
Abs(Dif)-LSD							
Dry Branch	-0.31128	-0.27161	-0.13369	.	-0.2617	-0.16498	-0.12789
Congaree	-0.27161	-0.31128	-0.17335	.	-0.22203	-0.20465	-0.16756
Black Creek	-0.13369	-0.17335	-0.3222	.	-0.08338	-0.21918	-0.3163
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.2617	-0.22203	-0.08338	.	-0.40186	-0.11987	-0.07678
Middendorf	-0.16498	-0.20465	-0.21918	.	-0.11987	-0.24609	-0.21403
Pee Dee	-0.12789	-0.16756	-0.3163	.	-0.07678	-0.21403	-0.33437

Positive values show pairs of means that are significantly different.

FIGURE 19b.

2-amino ethanol By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.121593
RSquare Adj	0.069307
Root Mean Square Error	0.486009
Mean of Response	0.537122
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	2.746516	0.549303	2.3255
Error	84	19.841177	0.236204	Prob>F
C Total	89	22.587694		0.0498

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.446929	0.12989
Congaree	15	0.718200	0.12549
Dry Branch	15	0.800067	0.12549
McBean	0	.	.
Middendorf	24	0.374083	0.09921
Pee Dee	13	0.362385	0.13479
Tobacco Rd	9	0.624556	0.16200

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[I]-Mean[J]	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	0.000000	0.081867	0.353138	.	0.175511	0.425983	0.437682
Congaree	-0.08187	0.000000	0.271271	.	0.093644	0.344117	0.355815
Blck Creek	-0.35314	-0.27127	0.000000	.	-0.17763	0.072845	0.084544
McBean	.	.	.	.	.	.	.
Tobacco, Rd	-0.17551	-0.09364	0.177627	.	0.000000	0.250472	0.262171
Middendorf	-0.42598	-0.34412	-0.07285	.	-0.25047	0.000000	0.011699
Pee Dee	-0.43768	-0.35582	-0.08454	.	-0.26217	-0.0117	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

Abs(Dif)-LSD	Dry Branch	Congaree	Blck Creek	McBean	Tobacco Rd	Middendorf	Pee Dee
Dry Branch	-0.35291	-0.27104	-0.00602	.	-0.232	0.107874	0.071449
Congaree	-0.27104	-0.35291	-0.08789	.	-0.31386	0.026007	-0.01042
Blck Creek	-0.00602	-0.08789	-0.3653	.	-0.2353	-0.25218	-0.28771
McBean	.	.	.	.	.	.	.
Tobacco Rd	-0.232	-0.31386	-0.2353	.	-0.45561	-0.1273	-0.15693
Middendorf	0.107874	0.026007	-0.25218	.	-0.1273	-0.279	-0.32113
Pee Dee	0.071449	-0.01042	-0.28771	.	-0.15693	-0.32113	-0.37909

Positive values show pairs of means that are significantly different.

FIGURE 19c.

putrescine By Aquifers

Oneway Anova

Summary of Fit

RSquare	0.039926
RSquare Adj	-0.01722
Root Mean Square Error	0.382619
Mean of Response	0.431489
Observations (or Sum Wgts)	90

Analysis of Variance

Source	DF	Sum of Squares	Mean Square	F Ratio
Model	5	0.511404	0.102281	0.6987
Error	84	12.297375	0.146397	Prob>F
C Total	89	12.808778		0.6260

Means for Oneway Anova

Level	Number	Mean	Std Error
Blck Creek	14	0.416643	0.10226
Congaree	15	0.481267	0.09879
Dry Branch	15	0.486000	0.09879
McBean	0	.	.
Middendorf	24	0.484042	0.07810
Pee Dee	13	0.273308	0.10612
Tobacco Rd	9	0.369111	0.12754

Std Error uses a pooled estimate of error variance

Means Comparisons

Dif=Mean[i]-Mean[j]	Dry Branch	Middendorf	Blck Creek	McBean	Congaree	Tobacco Rd	Pee Dee
Dry Branch	0.000000	0.001958	0.069357	.	0.004733	0.116889	0.212692
Middendorf	-0.00196	0.000000	0.067399	.	0.002775	0.114931	0.210734
Blck Creek	-0.06936	-0.0674	0.000000	.	-0.06462	0.047532	0.143335
McBean	.	.	.	.	.	.	.
Congaree	-0.00473	-0.00278	0.064624	.	0.000000	0.112156	0.207959
Tobacco Rd	-0.11689	-0.11493	-0.04753	.	-0.11216	0.000000	0.095803
Pee Dee	-0.21269	-0.21073	-0.14334	.	-0.20796	-0.0958	0.000000

Alpha= 0.05

Comparisons for each pair using Student's t

	Dry Branch	Middendorf	Blck Creek	McBean	Congaree	Tobacco Rd	Pee Dee
1.98862							
Abs(Dif)-LSD							
Dry Branch	-0.27784	-0.24848	-0.2134	.	-0.2731	-0.20393	-0.07563
Middendorf	-0.24848	-0.21965	-0.18848	.	-0.24766	-0.18247	-0.05129
Blck Creek	-0.2134	-0.18848	-0.28759	.	-0.21813	-0.27755	-0.14973
McBean	.	.	.	.	.	.	.
Congaree	-0.2731	-0.24766	-0.21813	.	-0.27784	-0.20866	-0.08036
Tobacco Rd	-0.20393	-0.18247	-0.27755	.	-0.20866	-0.35868	-0.23414
Pee Dee	-0.07563	-0.05129	-0.14973	.	-0.08036	-0.23414	-0.29844

Positive values show pairs of means that are significantly different.