STATEWIDE GROUND-WATER QUALITY IN SMALL PUBLIC WATER SYSTEMS

John C. Donahue and Susan R. Kibler

GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
WATERSHED PROTECTION BRANCH
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GEORGIA DEPARTMENT OF NATURAL RESOURCES
Noel Holcomb, Commissioner

ENVIRONMENTAL PROTECTION DIVISION
Carol A. Couch, Director

WATERSHED PROTECTION BRANCH
Linda MacGregor, Branch Chief

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CHAPTER 1 INTRODUCTION

1.1 PURPOSE AND SCOPE

This report, covering the period October 2006 through February 2008, is the third in a series of summaries to examine potential ground-water impairment within specific areas of Georgia or involving specific types of wells. The first nineteen summaries of the Circular 12 series dealt with the chemical quality of ground water Statewide.

These summaries are among the tools used by the Georgia Environmental Protection Division (EPD) to assess trends in the quality of the State's ground-water resources. EPD is the State organization with regulatory responsibility for maintaining and, where possible, improving ground-water quality and availability. EPD has implemented a comprehensive statewide ground-water management policy of anti-degradation (EPD, 1991; 1998). Five components comprise EPD's current ground-water quality assessment program:

1. The Georgia Ground-Water Monitoring Network. The Georgia Geologic Survey Branch (GGS) of EPD and its successor, the Regulatory Support Program of the Watershed Protection Branch, maintain this program. Early in calendar year 2004, a three-part monitoring program replaced the Statewide aquifer-specific monitoring network. The new program examines ground-water: a) in the coastal area for influx of connate brines, sea water, or low-quality surface water; b) in the Piedmont and Blue Ridge for impacts from development and rural land use as well as to gain a more thorough understanding of the area's ambient ground water; and c) from small public water systems to spot check for intermittent contamination that might escape detection under item 2) below. The current report summarizes findings for part c) of the program, the Small Public Water System Monitoring Project.

2. Sampling of public drinking water wells as part of the Safe Drinking Water Program, also of the Watershed Protection Branch. This program provides data on the quality of ground water that the residents of Georgia are using.

3. Special studies addressing specific water quality issues. Examples of these types of studies include a survey of nitrite/nitrate levels in shallow wells located throughout the State of Georgia (Shellenberger, et al., 1996; Stuart, et al., 1995), operation of a Pesticide Monitoring Network conducted jointly by the GGS and the Georgia Department of Agriculture (GDA) (Tolford, 1999; Glen, 2001), and the Domestic Well Pesticide Sampling Project conducted jointly by the GGS and the GDA (Overacre, 2004, Berry, 2005).

4. Ground-water sampling at environmental facilities such as municipal solid waste landfills, RCRA facilities, and sludge disposal facilities. The primary branches responsible for monitoring these facilities are EPD's Land Protection, Watershed Protection, and Hazardous Waste Management Branches.

5. The wellhead protection program (WHP), which is designed to protect the area surrounding a municipal drinking water well from contaminants. The U.S. Environmental Protection Agency (EPA) approved Georgia's WHP Plan on September 30, 1992. The WHP Plan became a part of the Georgia Safe Drinking Water Rules, effective July 1, 1993. The protection of public water supply wells from contaminants is important not only for maintaining ground-water quality, but also for ensuring that public water supplies meet health standards.

1.2 STATEWIDE SMALL PUBLIC WATER SYSTEM GROUND-WATER MONITORING PROJECT

The study area for the Statewide Small Public Water System Ground-Water Monitoring Project encompassed all 159 counties in Georgia (Fig. 1-1). The stations sampled consisted of 177 wells and 3 springs supplying water to small permitted public systems (Figure 1-2). For the purposes of this project, a small permitted system is defined as serving a population of 25 – 500 persons, as permitted by the EPD Drinking Water Program. An additional focus of this study included targeting stations that were located in low income and minority communities. Study participants were selected from the Public Water System Permittee List, which is available online at the EPD website. Water system operators who had participated in earlier studies were excluded unless they had expressed an interest in additional studies.

While the initial objective was to sample at least one station per county, not every county had a sampling station that met the study criteria. Some counties lacked ground-water systems that were sufficiently small. In other counties, the few suitable stations either had been used in a previous study or had owners who elected not to participate.

Waters from the sampled stations were field tested for pH, conductivity, temperature, and, where possible, dissolved oxygen. The sampling stations were located using global positioning system (GPS) receivers. At 19 stations, sample waters received comparative (water versus background) radioactivty measurements. Laboratory testing for the project included analyses for volatile organic compounds (VOCs), chloride, sulfate, nitrate/nitrite, total phosphorus, and metals, including uranium and arsenic.

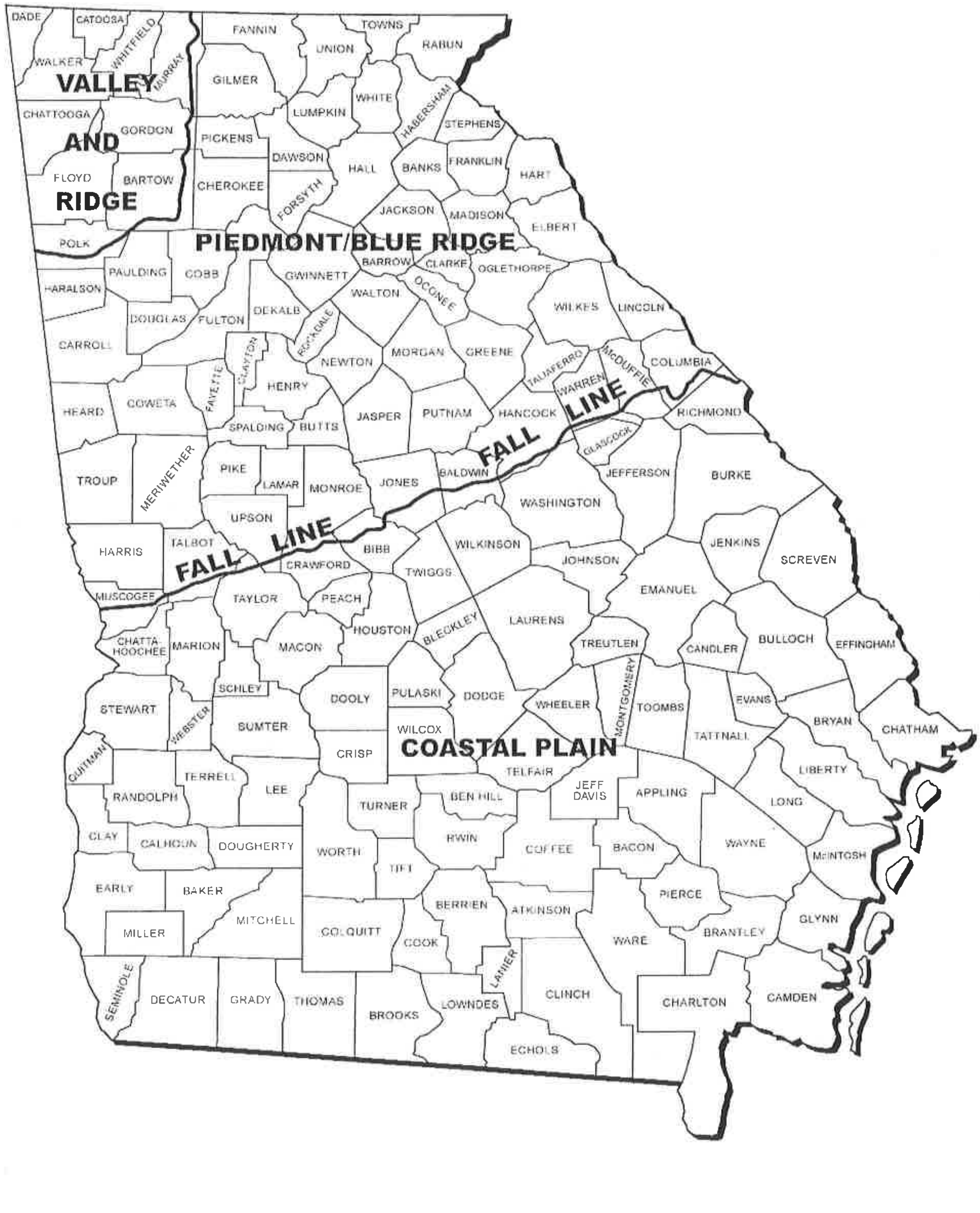

Figure 1-1. Map of Georgia, Showing the Counties That Lie Within the Study Area.

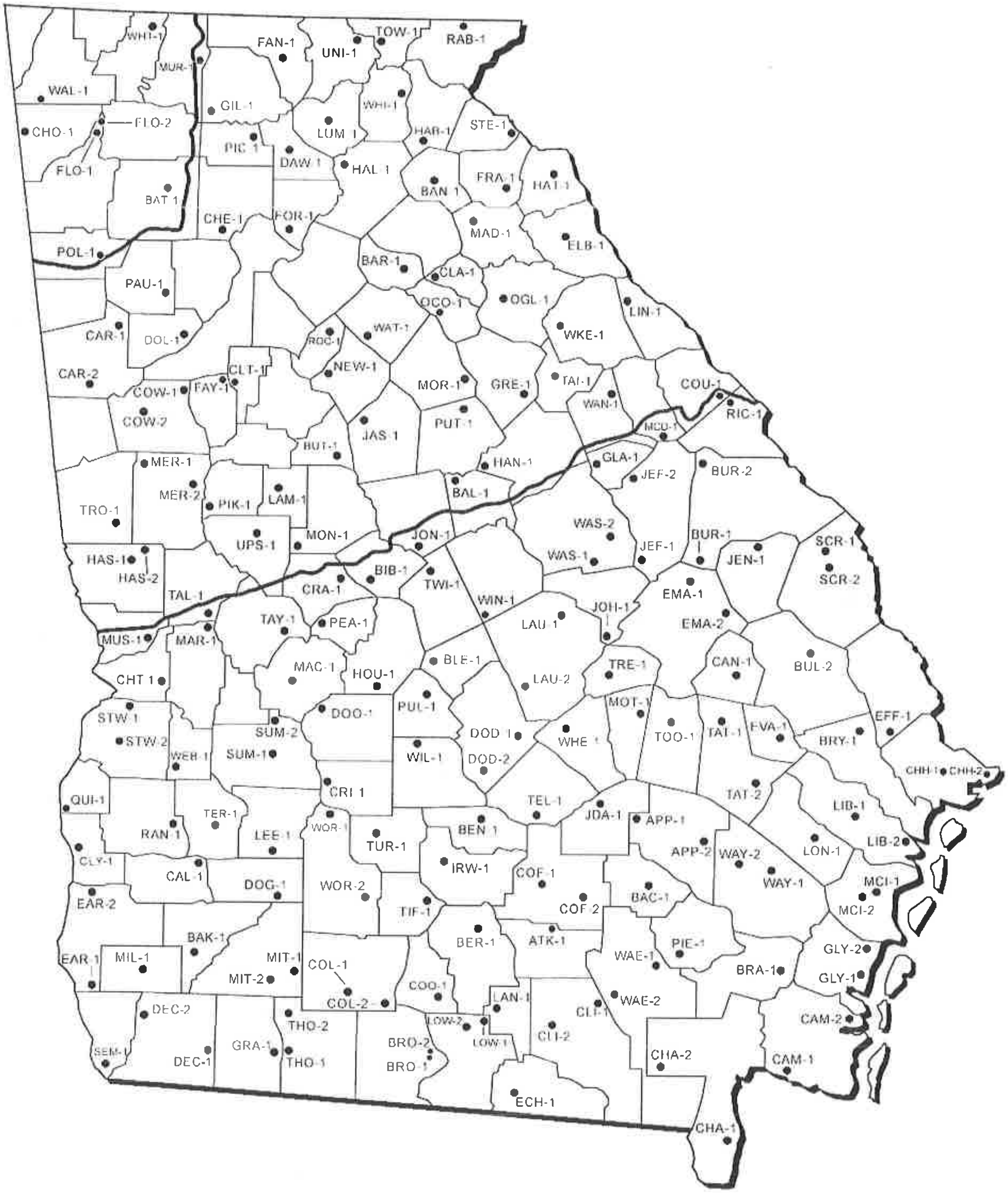

Figure 1-2. Location Map Showing Sampling Stations.

The State has established limits, termed Primary or Secondary Maximum Contaminant Levels (MCLs) and action levels, on the concentrations of certain substances in water made available to the public (EPD, 2007). Primary MCLs apply to substances that pose a threat to health. Secondary MCLs apply to substances which, though not ordinarily a threat to health, nevertheless impart an offensive quality to the water, such as bad taste or ability to stain. Action levels apply to lead and copper due to health reasons. During routine copper and lead monitoring, if more than 10% of the water samples collected from user outlets in a public water system contain more than 15 parts per billion (ppb) of lead or more than 1,300 ppb of copper, the water system must apply treatment to lower the levels of these metals. Although the MCLs and action levels apply only to treated water made available to the public, they are useful guidelines for evaluating the quality of raw (untreated) water.

1.3 ECONOMIC AND POPULATION CRITERIA

Prior to sampling, the approximate geographic location of each well was compared to the economic and population data contained in the 2000 United States Decennial Census Survey (2000 Survey). More information on the 2000 Survey can be found on the United States Census Bureau (USCB) website at www.census.gov. For this project, the 2000 Survey was used, as the 2006 US Census American Community Survey (2006 Survey) was not available for all areas at the time of this report. Where possible, sampling locations were selected in areas that had above average levels of poverty or minority populations. Once the sampling for each station had been completed and the exact coordinates of the well had been determined, the location was again compared to the census data maps.

For the 2000 Survey, the USCB used a combination of income thresholds to establish the number of people living in poverty. The number is reported as a percentage of individuals living below the poverty level. More information as to how the income thresholds and the poverty level are established can be found on the USCB website. In the US, the percentage of people living in poverty is reported as 12.4 percent. Of the 180 sites that were sampled for this project, 120 sites (67 percent) were located in areas where the level of poverty exceeded the national average.

The sampling locations were also compared to the USCB data for two minority populations: Hispanic/Latino and Black/African American. The percentage of the population in the US that self-identify as Hispanic/Latino is reported as 12.5 percent. Of the 180 sites that were sampled for this project, 6 sites (3 percent) were located in areas where the Hispanic/Latino population exceeded the 12.5 percent national average. The percentage of the population in the US that self-identify as Black/African American is reported as 12.3 percent. Of the 180 sites that were sampled for this project, 128 sites (71 percent) were located in areas where the Black/African American population exceeded the 12.3 percent national average.

CHAPTER 2 HYDROGEOLOGIC FRAMEWORK

This report recognizes three hydrogeologic provinces in Georgia by their general geologic and hydrologic characteristics (Figure 1-1). These provinces consist of:

1. the Coastal Plain province of south Georgia;

2. the Piedmont/Blue Ridge province, which includes all but the northwest corner of north Georgia; and

3. the Valley and Ridge province of northwest Georgia.

Of the 180 stations, 7 were located in the Valley and Ridge province, 55 were located in the Piedmont/Blue Ridge province, and 118 were located in the Coastal Plain province.

2.1 COASTAL PLAIN PROVINCE

Georgia's Coastal Plain Province generally comprises a wedge of loosely consolidated sediments, ranging in age from Cretaceous to Holocene, which gently dip and thicken to the south and southeast. The oldest units are exposed along the Fall Line, which forms the northern limit to the Coastal Plain, and successively younger units crop out to the south and southeast. The Atlantic Ocean bounds the Coastal Plain to the east. The Coastal Plain passes out of the State to the northeast, the south, and the west.

The main water bearing units in the Coastal Plain consist of permeable sands and limestones. In their outcrop areas, these units are unconfined. Down dip from the outcrop areas, the water bearing units are confined above and below by layers of poorly permeable sediments. Water enters the aquifers in their updip outcrop areas, where permeable sediments of the aquifer are exposed. Ground-water flow through confined Coastal Plain aquifers is generally to the south and southeast, in the direction of the dip of the rocks. Porosity in the sands is primary, i.e., the void space lies between mineral grains. Porosity in the limestones is a mix of primary, as spaces between shell fragments, and secondary, as fractures and solution-enlarged voids. The limestones are the most prolific water producers in the Coastal Plain.

The Dougherty Plain, a karst plain that occupies much of southwest Georgia, is a major region of the Coastal Plain. This plain extends from Dooly County southwestward to Seminole County and is about 50 miles across at its widest point. The characteristic terrain is very flat and, except for numerous, commonly water-filled sinkholes and depressions, is nearly featureless. Smaller surface drainage ways (locally called "drains") carry water only during wet periods. Normal drainage occurs via cave systems.

An important subsurface feature in the Coastal Plain is the Gulf Trough. The trough is a narrow linear northeast/southwest trending subsurface feature with an axis lying roughly along a line from Panama City, FL, through just south of Statesboro, GA (Kellam and Gorday, 1990; Scott, 2001). Lower permeability sediments occupying the trough impede groundwater flow to the south and southeast. Ground waters from the vicinity of the trough tend to have higher dissolved solid contents and may contain high amounts of barium, sulfate, and radionuclides.

2.2 PIEDMONT/BLUE RIDGE PROVINCE

Igneous and metamorphic bedrock ranging in age from Precambrian to Mesozoic characterizes the Piedmont/Blue Ridge province. The igneous rocks are predominantly granitic. Smaller amounts of mafic rocks also occur, with Mesozoic diabase being the youngest. The metamorphic rocks are predominantly regionally metamorphosed and multiply deformed. The rock types include schists, gneisses, amphibolites, quartzites, marbles, granulites, and mylonites. Minor amounts of contact metamorphic rocks may accompany diabase intrusions. The province passes out of the State to the northeast and southwest. The Fall Line forms the southern boundary of the province, while the Great Smoky-Cartersville Fault System bounds it to the northwest. The topography of the Blue Ridge region is predominantly mountainous, while that of the Piedmont region is predominantly rolling. The two regions, however, behave as a single hydrogeologic entity. The province contains a single aquifer system composed of two major hydrogeologic units: regolith and fractured bedrock (Heath, 1980; Daniel and Harned, 1997).

Typical regolith is highly porous and is composed of a surficial veneer of soil or, near stream bottoms and former stream bottoms, alluvium, underlain by saprolite (Heath, 1980; Daniel and Harned, 1998). Saprolite is bedrock that has undergone extensive chemical weathering in place to a material rich in clay minerals. Many of the structures and textures of the original bedrock are commonly preserved, with the saprolite appearing as a "rotten" version of the original rock. The saprolite typically grades downward through a transition zone into unweathered, fractured bedrock.

The regolith serves as a reservoir that feeds ground water downward into the underlying fractured bedrock (Heath, 1980). The water table usually lies within the regolith and, at rest, is a subdued imitation of the topography, with flow proceeding from high areas toward valleys.

Unlike the regolith, the bedrock has almost no primary porosity, i.e., void space between mineral grains. Nearly all the ground water in these rocks is stored in fractures and solution voids (secondary porosity). In the North Carolina Piedmont, Daniel and Harned (1998) found 1-3% porosity typical for bedrock.

Fractures, which open the rock to weathering, consist of faults and joints. Faults are breaks in the rock with differential displacement, and joints are breaks in the rock with little differential displacement (Heath, 1980). Fractures generally are more numerous and wider near the bedrock surface. Weathering can enlarge the fractures and alter the rock to saprolite. Large fractures in bedrock function as conduits, thus wells tapping bedrock can have larger yields than those tapping the regolith. At a depth of about 600 feet, pressure from the overlying rock column becomes too great and fractures are held shut (Daniel and Harned, 1998).

2.3 VALLEY AND RIDGE PROVINCE

The Valley and Ridge Province lies northwest of the Great Smoky/Cartersville Fault System and passes out of the State to the north and west. Bedrock in the province consists of consolidated Paleozoic sediments: sandstones, shales, mudstones, limestones, and dolostones. The rocks are folded and cut by numerous faults. Erosionally more resistant rock units form long ridges, while erosionally less resistant units underlie valleys. The faulting and folding have exposed the limestones and dolostones to weathering, and, karst features such as sinkholes and dry drainage ways occur in areas underlain by these carbonate rocks.

Primary porosity occurs, however, secondary porosity is the more important water-bearing feature. Surface and subsurface flow systems tend to be interconnected on a local scale. The carbonate rocks, notably those of the Knox Group, are the most prolific water producers, particularly where they occupy fold axes in broad valleys.

CHAPTER 3 METHODS

3.1 FIELD METHODS

Conductivity, pH, temperature, and, where possible, dissolved oxygen were monitored in the field with Horiba Model U-10 water quality meters. Garmin® eTrex Legend GPS receivers were used to measure latitude and longitude at the sampling station. At 19 stations, radioactivity readings were taken both over a five-gallon plastic bucket filled with sample water (sample reading) and over ground at a distance from the bucket (background reading) (Table A-1, Part A). A Mount Sopris Instrument Co. Model SC-132 handheld scintillation counter was used to measure radioactivity.

In most cases, wells had dedicated pumps with plumbing downstream of the wellhead that included spigots or other outlets. The outlet nearest the wellhead was typically used as the monitoring and collection point. A Y-tube formed of garden hose was fitted to the outlet. The Y-tube had a plastic pitcher fitted on one branch to accommodate the water quality meter probe, and the other branch of the Y-tube was left open to be used for sampling. The meter probe was inserted into the pitcher and the well's pump was turned on to initiate the purging process. Every five minutes, conductivity, pH, dissolved oxygen, and temperature readings were taken and recorded. Monitoring continued until these parameters stabilized, which typically occurred after 15 to 20 minutes of continuous purging. The final recorded readings of pH, conductivity, dissolved oxygen, and temperature are reported in Table A-1. For springs and for wells with plumbing that would not allow the attachment of the Y-tube, the water quality meter's calibration cup was used to draw aliquots for monitoring.

Once the field parameters stabilized, a metals sample was collected in a plastic 500 milliliter bottle containing a nitric acid preservative; a nitrate/nitrite and phosphorus sample was collected in a plastic 125 milliliter bottle containing a sulfuric acid preservative; and a chloride and sulfate sample was collected in a half-gallon (approx. 2 liter) plastic jug. VOC samples were collected in a triplet of septum vials containing a hydrochloric acid preservative.

When sampling was completed, the sample bottles, except for the half-gallon jug, were placed in doubled plastic bags. The bagged samples and the jug were then placed in ice water in a cooler. A trip blank, a septum vial containing clean water and a hydrochloric acid preservative prepared by EPD laboratory personnel, accompanied the VOC samples during transport.

Four wells underwent follow-up sampling because lead exceeded the action level or uranium exceeded the Primary MCL. The four wells are: CLA-1 (uranium), GRE-1 (uranium), LIN-1 (lead), and PIK-1 (uranium).

3.2 LABORATORY METHODS

Laboratory measurements of the concentrations of VOCs, chloride, nitrate/nitrite, total phosphorus, and metals took place at the EPD laboratory. The US EPA has approved and assigned identification numbers to various testing procedures, termed EPA methods, used in environmental venues. The EPD lab used the methods given in the table below.

Table 3-1. Analytical Methods

Analyte	EPA Method	Method Type
Metals (1)	200.7	ICP
Metals (2)	200.8	ICP/MS
Chloride and Sulfate	300.0	Ion Chromatography
Nitrate/Nitrite	353.2	Colorimetric
Total Phosphorus	365.1	Colorimetric
VOCs	524.2	GC/MS

The reporting limit is the lowest concentration of a substance that can be accurately measured. These limits are given in Table A-2 in the Appendix. The typical reporting limit for nitrate/nitrite is 0.02 parts per million (ppm) as nitrogen and for sulfate, the typical reporting limit is 10 ppm. During the current project, the high concentrations of these substances in some samples caused the reporting limits to be raised. Parts per million and parts per billion are equivalent, respectively, to milligrams per liter and micrograms per liter.

The ICP (inductively-coupled plasma spectrometry) method is generally the better method for analyzing major metals and abundant minor metals: calcium, magnesium, sodium, iron, manganese, titanium, and, to a degree, potassium. The values reported in Table A-1 Part B for calcium, cobalt, iron, potassium, magnesium, manganese, sodium, titanium, and vanadium were derived from ICP analysis.

The ICP method is subject to interferences when used for analyzing trace metals. These interferences can result in spuriously high reported concentrations for some metals. During this study, ICP analyses for zinc proved to be particularly vulnerable to interference. As a result, the values reported for chromium, nickel, copper, zinc, arsenic selenium, molybdenum, silver, cadmium, tin, antimony, barium, thallium, lead, and uranium were derived from ICP/MS (inductively-coupled plasma spectrometry/mass spectrometry) analysis. The ICP/MS method provides results for trace metals that are more accurate.

Chloride and sulfate were analyzed using ion chromatography, which depends on the affinity of the analyte for an ion-exchange medium. Nitrate/nitrite and total phosphorus were analyzed using colorimetric techniques. These methods involve converting the analyte to a strongly colored substance, which can then be compared with a color standard. VOCs were analyzed with the GC/MS (gas chromatography/mass spectrometry) technique.

CHAPTER 4 RESULTS

4.1 pH

One hundred and eighty-three pH measurements were made on 179 of the 180 stations. An instrument malfunction prevented a pH reading at station COW-1. The pHs of waters at 118 Coastal Plain stations ranged from 3.65 to 8.75. The pH measurements at 54 of the stations in the Piedmont/Blue Ridge ranged from 4.66 to 9.40. The pHs at the 7 Valley and Ridge stations ranged from 4.86 to 7.81. Sample waters were basic at 94 Coastal Plain stations, 8 Piedmont/Blue Ridge stations, and 2 Valley and Ridge stations. Two Piedmont/Blue Ride stations that underwent follow-up sampling registered acidic during one sampling and basic during the other: station LIN-1 changed from basic to acidic and station CLA-1 changed from acidic to basic.

4.2 CONDUCTIVITY

One hundred and eighty-four conductivity measurements were made covering all 180 stations. The conductivity measurements ranged from 6 microSiemenses per centimeter (uS/cm) to 437 uS/cm, with both the high and low values measured at Coastal Plain stations. Conductivities in the Piedmont/Blue Ridge ranged from 7 uS/cm to 360 uS/cm and, in the Valley and Ridge, from 10 uS/cm to 346 uS/cm. Inspection of Table A-1 shows that sample waters with lower conductivities generally tend to have acidic pHs and lower contents of sulfate and chloride and of the major metals calcium, magnesium, and sodium. Of the 4 stations that received follow-up sampling, original and follow-up conductivities were drastically different from each other only at station PIK-1.

In the Coastal Plain, the 11 stations with the lowest conductivities lie in the recharge area for the Cretaceous aquifer system, just south of the Fall Line. The up-dip portion of the Cretaceous aquifer system is sandy. Spring HAS-2, a station registering one of the lowest conductivities in the Piedmont/Blue Ridge, issues from the Hollis Quartzite (Hewett and Crickmay, 1935).

4.3 ANIONS AND NON-METALS

Samples from all 180 stations received testing for nitrate/nitrite and total phosphorus. Samples from 167 stations not in the Dougherty Plain received testing for chloride and sulfate, as well. Experience has shown Floridan Aquifer system ground water from the Dougherty Plain contains little or no detectable chloride or sulfate.

4.3.1 Chloride

The chloride contents of sampled waters ranged from undetectable to 30 ppm, far below the Secondary MCL of 250 ppm. Detectable chloride occurred in samples from 18 of the 106 Coastal Plain stations tested, 6 of the 53 Piedmont/Blue Ridge stations tested and none of the Valley and Ridge stations. Samples with the three highest chloride contents came from southeastern Coastal Plain stations (CAM-1, CHA-2, GLY-2). None of the stations that underwent follow-up sampling yielded any samples containing detectable chloride in the initial or the follow-up sampling.

4.3.2 Sulfate

Sulfate contents of sampled waters ranged from undetectable to 160 ppm, also below the Secondary MCL of 250 ppm. Sulfate was detected in samples from 67 of the 106 Coastal Plain stations tested, 20 of the 53 Piedmont/Blue Ridge stations tested, and none of the Valley and Ridge stations. Stations registering the four highest sulfate contents were in the Coastal Plain (highest to lowest: CAM-1, GLY-2, CAM-2, COL-1), with the three highest of these in the southeastern part. For 2 of the 4 stations that underwent follow-up sampling, the original samples and the follow-up samples contained nearly equal amounts of sulfate. Samples from the remaining 2 stations contained no detectable sulfate in the initial or the follow-up sampling.

4.3.3 Nitrate/Nitrite

The concentration range extended from undetected to 10 ppm as nitrogen. Nitrate/nitrite was detected in samples from 43 Coastal Plain stations, 42 Piedmont/Blue Ridge stations, and 6 Valley and Ridge stations. The sample with the highest nitrate/nitrite content came from an emergency stand-by well (LEE-1) at a mobile home park in the Dougherty Plain portion of the Coastal Plain. Nitrate/nitrite concentrations in samples from one other Coastal Plain station (DEC-2) and four Piedmont/Blue Ridge stations (CHE-1, HAB-1, LUM-1, WKE-1) exceeded the 3 ppm as nitrogen level generally considered the minimum likely reflective of human influence (Madison and Brunett, 1985). Though the LEE-1 sample equaled the Primary MCL for nitrate/nitrite, it did not exceed the MCL. Of the four multiply sampled stations, the repeat samples contained amounts of nitrate/nitrite that were roughly similar to those of the original samples.

4.3.4 Total Phosphorus

Total phosphorus data are available for all 180 stations. Phosphorus was detected in samples from 84 stations. Phosphorus concentrations ranged from undetected to 0.68 ppm, though most are below 0.1 ppm. Concentrations in Coastal Plain samples ranged from undetectable to 0.45 ppm, with 57 of 118 stations yielding water with detectable phosphorus. For Piedmont/Blue Ridge stations, concentrations ranged from undetected to 0.68 ppm (OGL-1), with 29 of 55 stations showing detectable amounts. Only one of the Valley and Ridge stations registered detectable phosphorus, at a level of 0.02 ppm. No MCLs are assigned to phosphorus. Among the four wells subject to follow-up sampling, all except LIN-1 gave follow-up samples with amounts of phosphorus similar to those of the original samples.

4.3.5 Dissolved Oxygen

Dissolved oxygen measurements are available for 45 stations and range from undetected to 8.88 ppm. The highest dissolved oxygen contents occur in sample waters from the Dougherty Plain and Fall Line areas of the Coastal Plain and in those from the Valley and Ridge. No MCLs exist for dissolved oxygen.

Though the monitoring/sampling apparatus is configured to minimize contact between the atmosphere and the sample water, air can nevertheless enter the sample water upstream of the apparatus and interfere with dissolved oxygen measurements. In open-hole wells when the water level is pumped below a productive fracture or other water-bearing feature, water can become aerated as it cascades down the well bore. In low recovery wells with short water columns, pumping the water level down near or to the pump's intake can allow the pump to take some air along with the sample water.

4.4 METALS

The metals analyzed for this project are given in Table A-1 Part B in the Appendix. Analyses failed to detect arsenic, nickel, tin, selenium, silver, cadmium, antimony, beryllium, and cobalt. These metals are not further discussed in this chapter. Samples from all 180 stations received metals analysis.

4.4.1 Alkali Metals

The EPD laboratory tested for the alkali metals sodium and potassium using the ICP method. Owing to low analytical sensitivity (reporting limit 5,000 ppb), potassium was not detected in any samples. No MCLs apply to either metal.

Sodium concentrations ranged from undetected to 160,000 ppb in well QUI-1. Detectable levels of the metal occurred in samples from 176 stations. The sodium content in the QUI-1 sample is nearly four times that in the sample with the second highest sodium content (JEF-2). As a general rule, waters with basic pHs and higher conductivities tend to have higher sodium contents. All four of the wells receiving follow-up sampling registered sodium results for the follow-up samples similar to those of the original samples. Although the number of samples in the Valley and Ridge province was comparatively small, the samples from that province seem generally lower in sodium than samples from the other two provinces.

4.4.2 Alkaline Earth Metals

The current study examined ground-water levels of the alkaline earth metals calcium, magnesium, and barium. The EPD laboratory determined calcium and magnesium by the ICP method. The laboratory used the ICP/MS method to test for barium. A Primary MCL of 2,000 ppb applies to barium; no MCLs apply to calcium or magnesium.

Calcium was detected in samples from 169 stations, with the maximum level being 85,000 ppb in the sample from well LEE-1 on the Dougherty Plain. The concentration of this metal tends to be depressed in waters with the lowest pHs (below about 6.00). The metal is more abundant in Coastal Plain and Valley and Ridge samples than in those from the Piedmont/Blue Ridge.

Magnesium was detected in samples from 151 stations. Well CAM-1 gave the sample with the high magnesium concentration of 35,000 ppb. The concentration of this metal tends to be lower in waters at the lowest pHs (below about 6.00). Magnesium concentrations generally tend to be lower in Piedmont/Blue Ridge samples than in samples from the other two provinces.

Barium was detected in samples from 171 stations. The analytical sensitivity afforded by ICP/MS testing for barium showed the metal to be a nearly ubiquitous trace element. The highest concentration of the metal, 300 ppb, was found in water from well MOT-1. Barium concentrations generally tend to be lower in Piedmont/Blue Ridge samples than in samples from the other two provinces. In the Coastal Plain, the highest concentrations of barium are found in samples from the vicinity of the Gulf Trough.

For the four wells subject to follow-up sampling, original and follow-up samples had the same calcium and magnesium levels for well PIK-1 and rose slightly in the other three. In all four wells, barium exhibited more variability between the original sampling and the repeat sampling.

4.4.3 Copper, Lead, and Zinc

Copper was detected in samples at 17 stations, lead at 29 stations, and zinc at 55 stations. Copper concentrations ranged up to 22 ppb, a level well below the Secondary MCL of 1,000 ppb and the action level of 1,300 ppb. The two highest lead concentrations found were 130 ppb (well LIN-1), in excess of the action level of 15 ppb, and 15 ppb (well RIC-1), equal to the action level. The highest zinc level found was 2,200 ppb (well TIA-1), below the 5,000 ppb Secondary MCL. Detectable concentrations of all three metals seem slightly more likely to occur in acid waters. Detections of two or all three of these metals in a single sample were common.

Concerning the four multiply sampled wells, well LIN-1 was the only well to yield a sample with detectable copper. The metal was detected in the original sample but not in the follow up sample. Well LIN-1 was resampled because of the excessive lead content in the original sample. The lead content of the follow-up sample was 1.2 ppb versus the original of 130 ppb. Both samples from well CLA-1 contained lead in similar amounts. No lead was detected in the original or follow-up sampling of wells GRE-1 and PIK-1. Zinc contents in all four wells exhibited more variability between the original sampling and the repeat sampling.

4.4.4 Iron, Manganese, and Chromium

The EPD laboratory analyzed for iron, manganese, and chromium using the ICP method. Since chromium is typically a trace metal, the laboratory also used the ICP/MS method to analyze for its presence. Secondary MCLs of 300 ppb and 50 ppb apply respectively to iron and manganese. A Primary MCL of 100 ppb applies to chromium.

Iron was detected in samples from 95 stations, with exceedances at 26 stations. Manganese was found in samples from 63 stations, with exceedances at 27 stations. Chromium was detected at a level below the Primary MCL at 2 stations. Detectable iron or manganese does not necessarily accompany detectable chromium.

Iron levels in the samples ranged up to 18,000 ppb. The highest iron concentrations occur in samples from Piedmont/Blue Ridge stations, although roughly the same proportion of Coastal Plain stations show detectable iron as Piedmont/Blue Ridge stations. The sample that registered the 18,000 ppb iron concentration contained some reddish brown sediment stirred up after the well (station BAL-1) was purged for about 10 minutes. The sediment is suspected of containing iron that, when solubilized during the digestion procedure that readies the sample for analysis, contributed to the high concentration detected. Only two Valley and Ridge stations showed detectable iron. Acid waters are somewhat more favorable for iron detections than basic waters, particularly if the iron concentration exceeds the Secondary MCL.

Manganese levels ranged up to 410 ppb. The three highest manganese concentrations occurred in samples from Piedmont/Blue Ridge stations. Manganese detections are proportionately the most numerous for Piedmont/Blue Ridge stations and the least common for Valley and Ridge stations. As with iron, acid waters were more favorable for manganese detections and manganese Secondary MCL exceedances than basic waters. Manganese occurred along with iron in samples from 49 stations.

Both stations giving waters with detectable chromium were located in the Piedmont/Blue Ridge province.

Concerning the four wells that underwent follow-up sampling, the iron and manganese levels in the follow-up samples are similar to those in the original samples.

4.4.5 Molybdenum, Uranium, and Vanadium

The EPD laboratory tested for molybdenum and uranium using the ICP/MS method and for vanadium using the ICP method. No MCLs apply to molybdenum or vanadium. A Primary MCL of 30 ppb applies to uranium. Detectable molybdenum was found in three samples from two stations, both in the Piedmont/Blue Ridge, with levels ranging up to 11 ppb. The three samples that contained detectable molybdenum also contained detectable uranium.

Uranium was found in 26 samples from 22 stations, with 20 of the stations located in the Piedmont/Blue Ridge province. Concentrations ranged up to 96 ppb (repeat sample from station CLA-1), with samples from Piedmont/Blue Ridge stations BAL-1, CLA-1, GRE-1, and PIK-1, exceeding the Primary MCL. All exceedances occurred in samples collected in the Piedmont/Blue Ridge. Uranium is more likely to occur in sample waters that are basic and in those that contain nitrate. All wells that underwent follow-up sampling gave samples with detectable uranium, both in the initial and in the follow-up samples.

Vanadium was detected in two samples from two stations, one a Piedmont/Blue Ridge sample (BAL-1) and the other a Coastal Plain sample (MIT-1). The pH of the Coastal Plain sample was basic and that of the Piedmont/Blue Ridge sample was acidic.

4.4.6 Aluminum and Titanium

Aluminum was detected in 30 samples from 29 stations, with levels ranging up to 1,300 ppb. Most of the aluminum detections occurred in acidic waters, although two of the three samples with the highest levels had basic pHs. Most aluminum detections occurred in waters with detectable nitrate/nitrite. Iron or manganese detections accompanied most aluminum detections. For aluminum, a Secondary MCL range of 50 ppb to 200 ppb applies, due to the varying success which treatment operations have with controlling aluminum levels. Only well CLA-1 of the follow-up sampled wells contained detectable aluminum. The second sample contained 1,300 ppb aluminum versus 130 ppb for the first. All reportable aluminum for this study was above the 50 ppb level.

Titanium was detected using the ICP method in three samples from two Piedmont/Blue Ridge stations. The levels ranged up to 15 ppb. No MCLs exist for titanium. In both cases in which detectable titanium was present in the sample water, detectable aluminum was also present.

4.4.7 Other Metals

This study found a single thallium detection in the sample from well JON-1. The level of the metal was 1.2 ppb, below the Primary MCL of 2 ppb.

4.5 VOLATILE ORGANIC COMPOUNDS

The EPD laboratory analyzed 184 samples from all 180 stations for VOCs. Eight samples from 8 stations tested positive for one or more of these compounds. Chloroform was the most widely occurring, being found in waters from four wells: CHO-1, JEF-2, OGL-1, and, PIC-1. Methyl-tert-butyl ether (MTBE) was next, being found in samples from three wells: ROC-1, SUM-1, and TRO-1. The sample from well OGL-1 also contained a small amount of toluene. Well CHE-1 yielded a sample with a small amount of para-dichlorobenzene. None of the VOC occurrences exceeded Primary MCLs. Five samples containing VOCs came from Piedmont/Blue Ridge wells, two from Coastal Plain wells; and one from a Valley and Ridge well.

4.6 RADIOACTIVITY

Nineteen pairs of radioactivity measurements are available for 19 stations. The count taken over water exceeded the background count at GRE-1. Water obtained from this well proved to contain excessive uranium.

CHAPTER 5 SUMMARY AND CONCLUSIONS

5.1 FIELD PARAMETERS

One hundred and eighty-three pH measurements were made on waters from 179 of the 180 stations sampled for the project: 118 stations on the Coastal Plain, 54 stations in the Piedmont/Blue Ridge province, and seven stations in the Valley and Ridge. The pHs ranged from 3.65 to 9.40. Basic pHs predominated in the Coastal Plain, while waters from the remaining two provinces were predominantly acidic. Waters with the lowest pHs, however, occurred on the Coastal Plain. The sample waters collected in the Coastal Plain are predominantly basic because to the extensive use of limestone aquifers, particularly the Floridan aquifer, for water supplies in that area.

One hundred and eighty-four conductivity measurements were made covering all 180 stations. The conductivity measurements ranged from 6 uS/cm to 563 uS/cm. The waters with the lowest conductivities came from the Hollis Quartzite in the Piedmont/Blue Ridge and the sandy recharge area of the Cretaceous aquifer system. Sample waters with lower conductivities generally tend to have acidic pHs and lower contents of sulfate and chloride and of the major metals calcium, magnesium, and sodium.

Comparative radioactivity measurements indicated that well GRE-1 might have a problem with radionuclides. Excessive uranium was detected in the sample water.

5.2 ANIONS AND NON-METALS

Samples from all 180 stations received testing for nitrate/nitrite and total phosphorus. Samples from 167 stations not in the Dougherty Plain received testing for chloride and sulfate, as well. On-site dissolved oxygen measurements are available for 45 stations.

The chloride contents of sampled waters ranged from undetectable to 30 ppm. Detectable chloride occurred in samples from 24 stations. The stations giving waters with the highest chloride contents are located in the southeastern part of the Coastal Plain. None of the Valley and Ridge stations gave samples with detectable chloride. Proportionately fewer Piedmont/Blue Ridge stations gave samples with detectable chloride than Coastal Plain stations. No samples exceeded the Secondary MCL for chloride (250 ppm).

Analyses detected sulfate in samples from 87 stations. Sulfate contents ranged from undetected to 160 ppm, with the highest concentrations in the southeastern part of the Coastal Plain. Stations giving samples with detectable sulfate were proportionately more common on the Coastal Plain than in the other two provinces. None of the Valley and Ridge samples contained detectable sulfate. No samples exceeded the Secondary MCL for sulfate (250 ppm).

Nitrate/nitrite was detected in samples from 91 stations and ranged up to 10 ppm as nitrogen. Though none exceeded the Primary MCL, the sample from the Coastal Plain well LEE-1 equaled the Primary MCL of 10 ppm as nitrogen. Five other wells, one in the Coastal Plain and four in the Piedmont/Blue Ridge, gave samples with nitrate/nitrite levels in excess of the 3 ppm level considered to be a maximum for natural background.

Of the six samples with elevated nitrate/nitrite contents, four came from trailer park wells and two from small town wells. Trailer park well LEE-1 is situated in a mixed land use area with woodlands, row-crop fields, pecan orchards, and residential/ commercial developments nearby. The agricultural, horticultural, and residential/ commercial areas are all possible contributors to the water's nitrate/nitrite content. Of special note, a pecan grower with an orchard adjacent to the trailer park fertilizes via irrigation water, which can seasonally raise ground-water nitrate/nitrite levels. The elevated nitrate/nitrite content of water from mobile home park well HAB-1 may be due in part to an intermittently leaky sewer line up gradient from the well.

Total phosphorus data are available from all 180 stations. Phosphorus was detected in samples from 84 stations and ranged up to 0.68 ppm, with the highest level occurring in Piedmont/Blue Ridge sample OGL-1. A little more than half the Coastal Plain and Piedmont/Blue Ridge stations gave samples with detectable phosphorus; only one sample from the Valley and Ridge did so. No MCLs exist for phosphorus.

Dissolved oxygen measurements are available for 45 stations, with concentrations ranging up to 8.88 ppm. Most of the highest dissolved oxygen contents occur in sample waters from the Coastal Plain's Dougherty Plain and Fall Line areas and from the Valley and Ridge. Dissolved oxygen measurements are subject to interference from well and plumbing conditions that expose the sample water to air. Disallowing for interference, the high oxygen contents of these waters reflects their origin in ground-water recharge areas.

5.3 METALS

Metals were analyzed in samples for all 180 stations, using ICP and ICP/MS methods. The ICP method has generally lower sensitivity and is subject to interferences. The method generally works well for the more abundant metals in ground water such as calcium and sodium. ICP/MS analysis works well for trace metals such as zinc or barium. Metals analyses did not detect any potassium, beryllium, arsenic, nickel, selenium, cadmium, antimony, silver, tin, or cobalt.

The EPD laboratory tested samples from all 180 stations for the alkali metals sodium and potassium. No MCLs are established for either metal. Due to the low analytical sensitivity for the metal, no potassium was detected at any of the stations. Sodium was detected in samples from 176 stations, with a high level of 160,000 ppb at Coastal Plain station QUI-1. Well QUI-1 may be drilled to the same horizon as a municipal well at nearby Georgetown, which also gives water with a relatively high sodium content (Donahue, 1997). Two of the stations providing waters with no detectable sodium are located in the Cretaceous aquifer recharge area just south of the Fall Line. As a general rule, waters with basic pHs and higher conductivities tend to have higher alkali metal contents. Samples from Valley and Ridge stations seem to have generally lower sodium contents than those from the other two provinces.

The EPD laboratory tested samples from all 180 stations for the alkaline earth metals beryllium, magnesium, calcium, and barium. Primary MCLs of 2,000 ppb apply to barium and 4 ppb to beryllium. No MCLs apply to calcium and magnesium. No beryllium was detected in any samples.

Calcium was detected in samples from 169 stations, with the maximum level being 85,000 ppb in the sample from Dougherty Plain well LEE-1. This well also produced water with the highest nitrate/nitrite content in the study. Magnesium was detected in samples from 151 stations, with a high of 35,000 ppb occurring in a sample from southeastern Coastal Plain well CAM-1. The sample from this well also registered the highest sulfate content found by the study. The concentrations of both metals tend to be depressed in waters with the lowest pHs (below about 6.00).

The ICP/MS method detected barium in samples from 171 stations, with a high level of 300 ppb in well MOT-1, a concentration well below the Primary MCL of 2,000 ppb. Wells such as MOT-1 that are drilled in the vicinity of the Gulf Trough can yield waters with elevated concentrations of barium. The analytical sensitivity afforded by ICP/MS testing for barium showed the metal to be a widespread trace element.

Samples from all 180 stations received analyses for copper, lead, and zinc. Copper was detected in samples from 17 stations, lead in samples from 29 stations, and zinc in samples from 55 stations. The concentrations of copper ranged up to 22 ppb (well LIN-1); concentrations of lead ranged up to 130 ppb (well LIN-1); and concentrations of zinc ranged up to 2,200 ppb (well TIA-1). The lead concentration of the original sample from Piedmont/Blue Ridge well LIN-1 exceeded the action level (15 ppb). No other samples contained any of these three metals in excess of applicable action levels or MCLs. Detections of these three metals seem more likely to occur in acid waters. The three metals commonly occurred in various combinations in single samples.

The excessive lead level in the original sample from well LIN-1 and the high lead level in the sample from RIC-1 probably occurred when corrosion films that had built up on the brass raw water faucets at both locations became incorporated into the sample water. During the second sampling of LIN-1, the raw water faucet spout was scrubbed inside and out with a paper towel. Also, the faucet put out a good flow (in contrast to the trickle during the first sampling). This increased flow would have flushed the faucet spout thoroughly and did allow the use of the split tube apparatus, minimizing exposure of sample water to airborne lead. The lead concentration in the follow-up sample proved to be dramatically lower (1.2 ppb vs. 130 ppb), and the copper concentration fell to undetectable.

Iron was detected in samples from 95 stations, with Secondary MCL exceedances at 26 stations. Manganese was found in samples from 63 stations, with Secondary MCL exceedances at 27 stations. Chromium was detected at two stations, both in the Piedmont/Blue Ridge, with no Primary MCL exceedances.

Iron levels in the samples ranged up to 18,000 ppb, and, manganese levels up to 360 ppb. The highest iron and manganese concentrations are found in waters from Piedmont/Blue Ridge stations. Iron and manganese detections and exceedances tend to be more numerous in acid waters than in basic waters. Manganese occurred along with iron in samples from 47 stations.

The EPD laboratory tested samples from all 180 stations for molybdenum, uranium, and vanadium. No MCLs apply to molybdenum and vanadium. A 30 ppb Primary MCL applies to uranium.

Molybdenum occurred in three samples from two Piedmont/Blue Ridge stations, with levels ranging up to 11 ppb. Uranium accompanied molybdenum in samples from both stations.

Uranium, was found in 26 samples from 22 stations, with concentrations ranging up to 96 ppb (follow-up sample of well CLA-1). Twenty of the 22 stations were located in the Piedmont/Blue Ridge province and the remaining two in the Coastal Plain Province. Concentrations at 4 stations, all in the Piedmont/Blue Ridge, exceeded the Primary MCL. Uranium seems more likely to occur in sample waters that are basic and in those that contain nitrate/nitrite.

Vanadium was detected in samples from two stations, with a high concentration of 16 ppb. One of the two stations, located in the Piedmont/Blue Ridge, yielded acidic water, the other, located in the Coastal Plain, yielded basic water. No MCLS apply to vanadium.

Aluminum was detected in samples from 30 samples from 29 stations, with levels ranging up to 1,300 ppb. Waters with detectable aluminum tend to be acidic, to have detectable iron and manganese and to have detectable nitrate/nitrite. Samples with detectable aluminum also tend to have low concentrations of sodium, calcium, and magnesium. A Secondary MCL range is applied to aluminum depending on the ability of the treatment system to control aluminum levels.

Titanium was detected in three samples from two Piedmont/Blue Ridge stations. The levels ranged up to 15 ppb. Sample waters containing detectable titanium also contained detectable aluminum. No MCLs apply to titanium.

Thallium occurred in a single sample from a Fall-Line area Coastal Plain well. The well serves a trailer park located beside a railroad track in a mostly wooded area. The thallium level was below the Primary MCL of 2 ppb. The source of the metal is unknown, although illegal dumping is a possibility.

5.4 VOLATILE ORGANIC COMPOUNDS

Analyses of 184 samples from 180 stations found VOCs in eight samples from eight stations. The detected VOCs consisted of the following: chloroform (four detections), MTBE (three detections), para-dichlorobenzene (one detection), and toluene (one detection, along with a chloroform detection). Five of the affected wells were located in the Piedmont/Blue Ridge province, three in the Coastal Plain, and one in the Valley and Ridge. All VOCs were below applicable MCLs (no MCL exists for MTBE). Chloroform usually does not enter ground water via recharge, but forms in situ as a byproduct from halogenated disinfectants. MTBE has been used as a motor fuel additive.

5.5 OVERALL QUALITY OF GROUND WATER AVAILABLE TO SMALL PUBLIC WATER SYSTEMS

From the standpoint of human health, the overall chemical quality of ground water available to small public water systems is generally good.

Of the metals subject to Primary MCLs or action levels, uranium was the only one to exceed its Primary MCL, which occurred for four Piedmont/Blue Ridge wells. Twenty of the 22 stations yielding water with detectable uranium were located in the Piedmont/Blue Ridge province. Outside of their concentration in that province, no regularity concerning the uranium occurrences is yet obvious. The metals copper, chromium, and lead are also subject to health-related limits, but the study found no exceedances for any of these metals. Two instances of high (though not excessive) lead in well water are almost certainly due to contamination of the sample water by corrosion films on brass raw water outlets (faucet brass alloys usually contain a small amount of lead for improving the machining characteristics of the metal). Copper also seems mostly a plumbing contribution. Chromium probably is naturally occurring.

Nitrate/nitrite is subject to a Primary MCL, though the study found no exceedances. Six wells yielded samples with nitrate/nitrite in excess of the 3 ppm as nitrogen level considered natural background. The wells serve a small town and three mobile home parks in the Piedmont/Blue Ridge and a mobile home park and a small town in the Coastal Plain. The Coastal Plain stations are located in the Dougherty Plain in areas of extensive agricultural land use. Fertilizer possibly contributes to the nitrate/nitrite contents of waters from the two Coastal Plain wells. One author is familiar with a large pecan orchard south of the mobile home park site that receives fertilizer via irrigation water. For one of the Piedmont/Blue Ridge mobile home park wells, its location down gradient from an intermittently leaky sewer line may account for some part of the high nitrate/nitrite level in its water. Two other Piedmont/Blue Ridge mobile home park wells are located in mixed land-use settings: woodland, residential, and commercial/light industrial. Elevated nitrate/nitrite for these sites might be tied to the latter two land uses. No source for the elevated nitrate/nitrite level in the small town well sample is obvious.

Primary MCLs apply to certain VOCs, although no exceedances were observed in this study. The compounds most frequently encountered were MTBE and chloroform. The province with the most VOC contaminated wells is the Piedmont/Blue Ridge.

Secondary MCLs apply to iron, manganese, and aluminum. These metals are present naturally and occur widely in ground waters in Georgia. The metals exceeded Secondary MCLs in samples from 69 of the 180 stations and are a major cause of poor chemical and physical quality for ground water. Secondary MCLs also apply to the metals copper and zinc and to the anions chloride and sulfate. The study found none of these in excess of its Secondary MCL. Copper and zinc, though possibly naturally occurring in some cases, seem mostly derived from plumbing. Chloride and sulfate are naturally occurring.

CHAPTER 6 LIST OF REFERENCES

Berry, M., 2005, Domestic Pesticide Sampling Testing Project 2000-2004: Georgia Geologic Survey Project Report 55, 154 p.

Daniel III, C.C., and Harned, D., 1997: Ground-Water Recharge to and Storage in the Regolith-Crystalline Rock Aquifer System, Guilford County, North Carolina: USGS Water Resources Investigations Report 97-4140, 65 p.

Donahue, John C., 1997, Ground-Water Quality in Georgia for 1995: Georgia Geologic Survey Circular 12L, 96 p.

EPD, 1991, A Ground-Water Management Plan for Georgia: Georgia Geologic Survey Circular 11 (1991 edition).

EPD, 1998, A Ground-Water Management Plan for Georgia: Georgia Geologic Survey Circular 11 (1998 edition).

EPD, 2007, Environmental Rule 391-3-5, Safe Drinking Water.

Glen, J.C., 2001, Pesticide Monitoring Network 1989-2000: Georgia Geologic Survey Project Report 43, 58 p.

Heath, R.C., 1980, Basic Elements of Ground-Water Hydrology with Reference to Conditions in North Carolina: USGS Open File Report 80-44, 87 p.

Hewett, D. F., and Crickmay, G. W., 1937, The Warm Springs of Georgia, Their Geologic Relations and Origin, a Summary Report: USGS Water Supply Paper 818, 40 p., 8 pl.

Kellam, M.F., and Gorday, L.L., 1990, Hydrogeology of the Gulf Trough-Apalachicola Embayment Area, Georgia: Georgia Geologic Survey Bulletin 94, 75 p.

Madison, R.C., and Brunette, J.O., 1985, Overview of the Occurrence of Nitrate in Ground Water of the United States *in* National Water Summary 1984, Hydrologic Events, Selected Water-Quality Trends, and Ground-Water Resources: USGS Water Supply Paper 2275, p.93-105.

Overacre, L., 2004, Domestic Well Water Testing Project 2003: Georgia Geologic Survey Project Report 53, 65 p.

Scott, T.M., 2001, Text To Accompany the Geologic Map of Florida: Florida Geological Survey Open File Report 80, 28 p.

Shellenberger, D.L., Barget, R.G., Lineback, J.A., and Shapiro, E.A., 1996, Nitrate in Georgia's Ground Water: Georgia Geologic Survey Project Report 25, 12 p., 1 pl.

Stuart, M.A., Rich, F.J., and Bishop, G.A., 1995, Survey of Nitrate Contamination in Shallow Domestic Drinking Water Wells in the Inner Coastal Plain of Georgia: Ground Water, Vol. 33, No. 2, p. 284-290.

Tolford, B., 1999, Pesticide Monitoring Network 1998-1999: Georgia Geologic Survey Project Report 40, 60p.

US Census Bureau, 2000 Decennial Census Tables, <http://factfinder.census. gov>, Dec. 2006, Jan. 2007.

Appendix

Laboratory and Well Data

LABORATORY AND WELL DATA

Table A-1 lists the values for both laboratory parameters and field parameters for each well or spring. For this table, the following abbreviations are used:

bg	=background
CP	=Coastal Plain province
Cl	=chloride
Co.	=county
cond.	=conductivity
cps	=counts per second
diss O_2	=dissolved oxygen
EMC	=electric membership corporation
FDR	=Franklin D. Roosevelt
Ga.	=Georgia
MHP	=mobile home park
Mt.	=mountain
MTBE	=methyl-tert-butyl ether
NA	=not available or not analyzed
ND	=not detected
No.	=number
NOx	=nitrate/nitrite
P	=total phosphorus
PBR	=Piedmont/Blue Ridge province
PCE	=tetrachloroethylene (perchloroethylene)
ppm	=milligrams per liter (parts per million)
ppm N	=milligrams per liter as nitrogen
ppb	=micrograms per liter (parts per billion)
RV	=recreational vehicle
S/D	=subdivision
SHS	=State Historic Site
SO4	=sulfate
SP	=State Park
TCE	=trichloroethylene
temp	=temperature (degrees Celsius)
uS/cm	= microsiemens/centimeter
USFS	=U.S. Forestry Service
USACE	=U.S. Army Corps of Engineers
VOC	=volatile organic compound
VR	=Valley and Ridge province

Table A-2 gives the reporting limits for the various analytes. The list of abbreviations used for Table A-1 also applies to Table A-2.

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well/Spring Name / County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
APP-1 **CP**	City of Graham Well #1 **Appling**	03/27/07	7.85	156	NA	24.4	NA	NA	ND	ND	ND	ND	0.03
APP-2 **CP**	City of Surrency Well #2 **Appling**	11/14/07	8.08	190	NA	27.0	NA	NA	ND	ND	29	ND	ND
ATK-1 **CP**	The Oaks S/D Well **Atkinson**	09/20/07	7.69	240	NA	22.2	20	20	ND	ND	69	ND	0.03
BAC-1 **CP**	Lee's MHP Well **Bacon**	03/27/07	8.03	159	NA	22.9	NA	NA	ND	11	ND	ND	0.02
BAK-1 **CP**	Jones Ecology Center Well #2 **Baker**	03/14/07	7.55	121	NA	20.5	90	90	ND	NA	NA	1.80	ND
BAL-1 **PBR**	Mallard Glen S/D Well **Baldwin**	10/24/07	6.99	179	NA	18.3	NA	NA	ND	ND	32	ND	0.23
BAN-1 **PBR**	Homer Hill Street Well **Banks**	09/06/07	6.54	105	NA	17.2	NA	NA	ND	ND	17	0.23	ND
BAR-1 **PBR**	Bent Creek S/D Well #1 **Barrow**	10/04/07	6.80	84	NA	17.6	NA	NA	ND	ND	10	0.20	0.03
BAT-1 **VR**	KOA Cartersville Well #1 **Bartow**	8/16/07	6.66	339	3.95	17.5	NA	NA	ND	ND	ND	2.80	ND
BEN-1 **CP**	Queensland-Fontana Street Well **Ben Hill**	03/28/07	7.66	122	NA	21.7	80	80	ND	ND	ND	ND	0.02
BER-1 **CP**	City of Alapaha Well #1 **Berrien**	06/21/07	7.81	231	NA	22.8	30	30	ND	12	49	ND	0.24
BIB-1 **CP**	Timber Ridge S/D Well #1 **Bibb**	10/03/07	4.39	6	NA	19.3	NA	NA	ND	ND	ND	0.12	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
APP-1 **CP**	ND	ND	ND	ND	100.0	ND	1.2	ND	ND	29K	ND	ND	9100	ND	11K	ND	ND
APP-2 **CP**	ND	ND	ND	ND	66.0	ND	ND	ND	86	30K	42	ND	14K	ND	19K	ND	ND
ATK-1 **CP**	ND	ND	ND	ND	64.0	ND	ND	ND	ND	45K	48	ND	20K	18	7600	ND	ND
BAC-1 **CP**	ND	ND	ND	ND	52.0	ND	ND	ND	ND	21K	ND	ND	12K	ND	17K	ND	ND
BAK-1 **CP**	ND	ND	ND	ND	3.6	ND	1.1	ND	ND	42K	ND	ND	ND	ND	1600	ND	ND
BAL-1 **PBR**	ND	ND	130	ND	9.9	ND	1.6	43.0	210	39K	18K	ND	2700	ND	19K	15	16
BAN-1 **PBR**	ND	ND	ND	6.9	6.1	ND	ND	18.0	250	21K	ND	ND	3000	ND	10K	ND	ND
BAR-1 **PBR**	ND	ND	ND	ND	5.5	ND	ND	12.0	ND	17K	ND	ND	2000	25	9500	ND	ND
BAT-1 **VR**	ND	ND	ND	ND	6.9	ND	ND	ND	ND	53K	ND	ND	15K	ND	2800	ND	ND
BEN-1 **CP**	ND	ND	ND	ND	150.0	ND	ND	ND	ND	36K	140	ND	2700	16	2300	ND	ND
BER-1 **CP**	ND	ND	ND	ND	130.0	ND	ND	ND	ND	32K	32	ND	21K	ND	15K	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
BLE-1 **CP**	Middle Ga. Wilderness Institute West Well **Bleckley**	08/09/07	7.18	226	NA	19.2	50	50	ND	ND	ND	ND	0.04
BRA-1 **CP**	Deerwood S/D #1 **Brantley**	04/26/07	7.85	276	NA	25.2	NA	NA	ND	21	76	ND	ND
BRO-1 **CP**	Fernwood MHP Well #1 **Brooks**	09/20/07	7.18	169	NA	21.4	NA	NA	ND	ND	ND	0.12	0.23
BRO-2 **CP**	Eaglewood Estates Well **Brooks**	12/19/07	7.42	189	NA	20.2	NA	NA	ND	ND	ND	ND	0.32
BRY-1 **CP**	Ken's MHP Well **Bryan**	11/15/07	8.03	144	NA	21.9	NA	NA	ND	ND	ND	ND	0.04
BUL-2 **CP**	Newton's Mobile Home Village Well **Bulloch**	12/12/07	8.17	140	NA	21.5	NA	NA	ND	ND	ND	ND	0.03
BUR-1 **CP**	City of Midville Well #2 **Burke**	04/12/07	7.73	138	NA	21.4	NA	NA	ND	ND	12	ND	0.07
BUR-2 **CP**	City of Keysville Well #1 **Burke**	10/24/07	4.60	8	NA	20.4	NA	NA	ND	ND	ND	0.03	ND
BUT-1 **PBR**	Indian Springs Main Well **Butts**	08/22/07	6.00	115	NA	18.0	200	200	ND	ND	15	0.17	0.05
CAL-1 **CP**	Nothing Fancy Catfish House Well #1 **Calhoun**	03/14/07	7.40	139	NA	21.3	NA	NA	ND	NA	NA	1.10	ND
CAM-1 **CP**	Camden Co. Flea Hill Recreation Well #1 **Camden**	04/26/07	7.48	434	NA	26.3	NA	NA	ND	30	160	ND	ND
CAM-2 **CP**	Ga. Episcopal Center Well **Camden**	10/18/07	7.50	339	NA	22.6	18	18	ND	27	110	ND	0.06

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
BLE-1 CP	ND	ND	ND	ND	53.0	ND	ND	ND	ND	68K	460	ND	2900	45	3000	ND	ND
BRA-1 CP	ND	ND	ND	ND	64.0	ND	ND	ND	ND	39K	110	ND	22K	ND	19K	ND	ND
BRO-1 CP	ND	ND	ND	ND	15.0	ND	ND	ND	130	37K	61	ND	12K	34	3100	ND	ND
BRO-2 CP	ND	ND	ND	ND	27.0	ND	ND	ND	ND	46K	86	ND	14K	44	3600	ND	ND
BRY-1 CP	ND	ND	10	ND	8.1	ND	ND	ND	ND	28K	39	ND	8000	ND	9300	ND	ND
BUL-2 CP	ND	ND	ND	ND	24.0	ND	ND	ND	ND	35K	41	ND	4900	65	6400	ND	ND
BUR-1 CP	ND	ND	ND	ND	58.0	ND	ND	ND	ND	40K	110	ND	2400	110	2500	ND	ND
BUR-2 CP	ND	ND	ND	ND	6.7	ND	ND	ND	ND	ND	21	ND	ND	ND	1300	ND	ND
BUT-1 PBR	ND	ND	12	ND	ND	ND	ND	3.4	ND	16K	350	ND	5100	ND	16K	ND	ND
CAL-1 CP	ND	ND	ND	ND	62.0	ND	ND	ND	ND	47K	ND	ND	1400	ND	1800	ND	ND
CAM-1 CP	ND	ND	ND	ND	35.0	ND	ND	ND	ND	70K	43	ND	35K	ND	22K	ND	ND
CAM-2 CP	ND	ND	ND	ND	36.0	ND	ND	ND	ND	54k	32	ND	29K	ND	22K	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
CAN-1 **CP**	Excelsior EMC Well #1 **Candler**	06/05/07	8.11	131	NA	24.5	NA	NA	ND	ND	ND	ND	ND
CAR-1 **PBR**	Villa Forest MHP **Carroll**	09/12/07	9.40	253	0.01	17.3	NA	NA	ND	ND	12	ND	ND
CAR-2 **PBR**	City of Roopville Well #1 **Carroll**	12/05/07	4.80	24	NA	18.0	NA	NA	ND	ND	ND	1.60	ND
CHA-1 **CP**	St. George School Well **Charlton**	04/25/07	7.46	303	NA	23.5	NA	NA	ND	17	23	ND	ND
CHA-2 **CP**	Stephen Foster S.P. Well **Charlton**	10/17/07	7.19	332	NA	21.9	NA	NA	ND	26	61	ND	ND
CHH-1 **CP**	Plantation Inn Mobile Estates Well **Chatham**	10/25/07	7.96	241	NA	22.6	NA	NA	ND	ND	ND	ND	ND
CHH-2 **CP**	Oatland Island Wildlife Center Well **Chatham**	12/12/07	8.24	145	NA	21.3	NA	NA	ND	ND	ND	ND	0.03
CHT-1 **CP**	Camp Darby Well **Chattahoochee**	04/25/07	5.80	110	0.02	20.6	NA	NA	ND	NA	NA	ND	0.08
CHO-1 **VR**	City of Menlo Alpine Well **Chattooga**	08/01/07	5.71	305	5.82	16.5	NA	NA	Chloroform = 1.1	ND	ND	1.00	ND
CHE-1 **PBR**	Little River MHP Well #1 **Cherokee**	08/09/07	5.32	231	2.1	17.6	NA	NA	p-Dichloro-benzene = 0.53	24	ND	4.80	ND
CLA-1 **PBR**	Crestmont Farms S/D #1 **Clarke**	10/04/07	6.99	87	NA	18.8	NA	NA	ND	ND	ND	0.25	0.04
CLA-1RPT **PBR**	Crestmont Farms S/D #1 **Clarke**	1/31/08	7.18	88	NA	18.5	NA	NA	ND	ND	ND	0.24	0.03

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems. Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
CAN-1 CP	ND	ND	ND	ND	31.0	ND	ND	ND	ND	30K	110	ND	3500	45	10K	ND	ND
CAR-1 PBR	ND	ND	43	ND	8.4	ND	ND	ND	ND	42K	940	ND	4600	370	7200	ND	ND
CAR-2 PBR	ND	ND	ND	ND	22.0	ND	ND	ND	ND	1000	ND	ND	ND	24	5100	ND	ND
CHA-1 CP	ND	ND	ND	ND	32.0	ND	ND	ND	ND	46K	ND	ND	26K	ND	24K	ND	ND
CHA-2 CP	ND	ND	ND	ND	37.0	ND	ND	ND	83	60K	54	ND	26K	ND	22K	ND	ND
CHH-1 CP	ND	ND	ND	ND	12.0	ND	ND	ND	ND	31K	120	ND	9800	ND	11K	ND	ND
CHH-2 CP	ND	ND	ND	ND	12.0	ND	ND	ND	ND	26K	ND	ND	10K	ND	10K	ND	ND
CHT-1 CP	ND	ND	50	ND	120.0	ND	ND	ND	ND	12K	1300	ND	2600	20	1600	ND	ND
CHO-1 VR	ND	ND	ND	ND	72.0	ND	ND	ND	ND	35K	ND	ND	21K	ND	1100	ND	ND
CHE-1 PBR	6.6	ND	ND	ND	44.0	ND	ND	ND	ND	15K	ND	ND	6000	34	19K	ND	ND
CLA-1 PBR	ND	ND	37	ND	4.0	ND	5.9	86.0	130	18K	210	ND	1300	ND	11K	13	ND
CLA-1RPT PBR	ND	ND	55	ND	8.8	ND	5.6	96.0	1300	20K	250	ND	1400	10	11K	14	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity		VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
							bg.	water					
CLY-1 **CP**	George T. Bagby S.P. Well **Clay**	06/05/07	7.71	250	0.02	20.9	NA	NA	ND	ND	14	ND	ND
CLT-1 **PBR**	Corinth Woods S/D Well #1 **Clayton**	08/22/07	6.30	350	2.11	18.4	NA	NA	ND	ND	92	0.59	ND
CLI-1 **CP**	Town of Argyle Well #1 **Clinch**	04/25/07	7.69	264	NA	24.4	NA	NA	ND	10	83	ND	0.03
CLI-2 **CP**	City of DuPont Well #1 **Clinch**	10/17/07	7.72	187	NA	22.8	NA	NA	ND	ND	32	ND	0.08
COF-1 **CP**	Maple Hill MHP Well **Coffee**	10/18/07	7.36	140	NA	22.8	50	50	ND	ND	ND	ND	0.09
COF-2 **CP**	General Coffee S. P. Well #1 **Coffee**	12/04/07	7.82	201	NA	22.5	NA	NA	ND	ND	36	ND	ND
COL-1 **CP**	Sunlit Pines MHP Well #1 **Colquitt**	3/14/07	7.50	437	0.04	23.2	NA	NA	ND	ND	97	ND	0.02
COL-2 **CP**	City of Berlin Well #1 **Colquitt**	11/29/07	7.57	147	NA	20.8	NA	NA	ND	ND	13	ND	0.03
COU-1 **CP**	Windy Acres MHP Well #1 **Columbia**	08/08/07	6.87	71	NA	20.2	NA	NA	ND	ND	11	ND	0.17
COO-1 **CP**	Sunshine Acres MHP Well **Cook**	03/14/07	7.26	273	2.86	21.6	NA	NA	ND	ND	23	ND	0.45
COW-1 **PBR**	The Gates S/D Well #1 **Coweta**	12/13/07	NA	170	NA	18.8	NA	NA	ND	ND	12	0.25	0.08
COW-2 **PBR**	Aspen Woods S/D Well #2 **Coweta**	02/25/08	5.97	56	NA	16.9	NA	NA	ND	ND	ND	0.46	0.05

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
CLY-1 CP	ND	ND	ND	ND	8.3	ND	ND	ND	ND	12K	25	ND	3800	ND	40K	ND	ND
CLT-1 PBR	ND	ND	ND	ND	19.0	ND	ND	12.0	66	44K	ND	ND	9400	ND	16K	ND	ND
CLI-1 CP	ND	ND	ND	ND	37.0	ND	ND	ND	ND	46K	73	ND	20K	27	9500	ND	ND
CLI-2 CP	ND	ND	ND	ND	27.0	ND	ND	ND	340	40K	39	ND	15K	23	ND	ND	ND
COF-1 CP	ND	ND	ND	ND	170.0	ND	ND	ND	ND	27K	ND	ND	9700	64	8500	ND	ND
COF-2 CP	ND	ND	ND	ND	57.0	ND	ND	ND	ND	26K	31	ND	16K	18	11K	ND	ND
COL-1 CP	ND	ND	ND	ND	41.0	ND	ND	ND	ND	58K	46	ND	23K	ND	7100	ND	ND
COL-2 CP	ND	9.9	23	ND	39.0	ND	3.2	ND	ND	31K	94	ND	11K	10	3700	ND	ND
COU-1 CP	ND	ND	ND	ND	28.0	ND	ND	ND	ND	9100	1000	ND	3400	160	7400	ND	ND
COO-1 CP	ND	ND	ND	ND	14.0	ND	ND	ND	ND	31K	ND	ND	15K	ND	6900	ND	ND
COW-1 PBR	ND	ND	20	ND	3.9	ND	ND	1.2	ND	23K	ND	ND	3800	ND	10K	ND	ND
COW-2 PBR	ND	ND	ND	ND	17	ND	1.1	ND	390	9900	260	ND	1800	ND	6700	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
CRA-1 **CP**	Crawford Co. Country Estates Well **Crawford**	05/10/07	3.78	54	7.28	19.0	NA	NA	ND	10	ND	2.80	0.14
CRI-1 **CP**	Veterans Memorial. S.P. Well **Crisp**	11/07/07	7.86	96	NA	20.0	NA	NA	ND	ND	ND	1.10	ND
DAW-1 **PBR**	Golden Ridge S/D Well **Dawson**	07/11/07	5.58	35	4.97	15.2	NA	NA	ND	ND	ND	0.06	ND
DEC-1 **CP**	City of Climax Well #2 **Decatur**	05/09/07	7.05	210	4.38	21.0	NA	NA	ND	ND	ND	0.54	ND
DEC-2 **CP**	City of Brinson Well #1 **Decatur**	11/28/07	7.55	168	NA	20.6	NA	NA	ND	ND	ND	5.80	ND
DOD-1 **CP**	City of Chauncey Well #4 **Dodge**	04/12/07	7.61	165	NA	20.4	NA	NA	ND	ND	ND	0.26	0.04
DOD-2 **CP**	City of Rhine Well #2 **Dodge**	12/20/07	7.41	156	NA	20.5	NA	NA	ND	ND	ND	0.22	ND
DOO-1 **CP**	City of Dooling Well #1 **Dooly**	06/07/07	6.11	164	8.36	20.4	NA	NA	ND	NA	NA	1.20	0.06
DOG-1 **CP**	Creekside RV Park Well #1 **Dougherty**	06/19/07	7.22	255	8.32	21.0	NA	NA	ND	NA	NA	1.20	ND
DOL-1 **PBR**	Dogwood Blossom MHP Well #1 **Douglas**	09/12/07	8.26	60	NA	16.0	NA	NA	ND	ND	ND	1.00	ND
EAR-1 **CP**	Town of Jakin Old Well **Early**	06/19/07	7.21	285	4.02	20.9	NA	NA	ND	NA	NA	1.30	ND
EAR-2 **CP**	Kolomoki Mounds S.P. Museum Well **Early**	11/28/07	7.80	154	NA	21.4	NA	NA	ND	ND	14	ND	0.05

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
CRA-1 CP	ND	9.2	ND	ND	54.0	ND	ND	ND	180	1300	54	ND	1100	30	6000	ND	ND
CRI-1 CP	ND	ND	11	ND	3.5	ND	2.4	ND	ND	33K	310	ND	ND	ND	1500	ND	ND
DAW-1 PBR	ND	ND	ND	ND	16.0	ND	1.4	ND	ND	3100	43	ND	1100	ND	2300	ND	ND
DEC-1 CP	ND	ND	ND	ND	5.7	ND	ND	ND	ND	40K	ND	ND	3600	ND	1800	ND	ND
DEC-2 CP	ND	ND	ND	ND	3.2	ND	ND	ND	ND	49K	ND	ND	1200	ND	2500	ND	ND
DOD-1 CP	ND	ND	ND	ND	90.0	ND	ND	ND	ND	51K	ND	ND	3600	ND	2700	ND	ND
DOD-2 CP	ND	ND	20	ND	37	ND	ND	ND	ND	48K	ND	ND	2300	ND	2000	ND	ND
DOO-1 CP	ND	ND	ND	ND	13.0	ND	ND	ND	ND	29K	ND	ND	ND	ND	2800	ND	ND
DOG-1 CP	ND	ND	43	ND	12.0	ND	ND	ND	ND	51K	ND	ND	1100	ND	2600	ND	ND
DOL-1 PBR	ND	ND	ND	ND	13.0	ND	ND	1.2	ND	6400	64	ND	2100	ND	4400	ND	ND
EAR-1 CP	ND	ND	ND	ND	16.0	ND	ND	ND	ND	57K	ND	ND	1100	ND	3200	ND	ND
EAR-2 CP	ND	ND	ND	ND	6.5	ND	ND	ND	ND	31K	140	ND	5600	ND	14K	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
ECH-1 **CP**	Echols Co. Water Authority Well #1 **Echols**	04/25/07	8.15	100	NA	21.7	NA	NA	ND	ND	ND	ND	0.03
EFF-1 **CP**	Twin Oaks MHP Well **Effingham**	10/25/07	7.90	226	NA	22.9	NA	NA	ND	ND	ND	ND	ND
ELB-1 **PBR**	Beaverdam MHP Well #1 **Elbert**	07/11/07	6.21	104	NA	16.9	NA	NA	ND	ND	16	1.20	0.07
EMA-1 **CP**	City of Summertown Well #4 **Emanuel**	04/10/07	7.74	150	NA	19.8	80	80	ND	ND	ND	0.09	0.02
EMA-2 **CP**	City of Garfield Railroad Ave. Well **Emanuel**	12/04/07	7.76	152	NA	21.5	NA	NA	ND	ND	ND	ND	ND
EVA-1 **CP**	City of Daisy Well #1 **Evans**	05/23/07	7.96	139	NA	24.1	NA	NA	ND	ND	ND	ND	ND
FAN-1 **PBR**	Fishhook Point S/D Well **Fannin**	07/25/07	6.47	95	NA	16.6	NA	NA	ND	ND	ND	0.55	ND
FAY-1 **PBR**	Fernwood MHP Well #1 **Fayette**	02/13/08	5.88	94	NA	16.4	NA	NA	ND	ND	ND	0.27	0.05
FLO-1 **VR**	Camp Sidney Dew Main Well **Floyd**	08/01/07	6.02	249	3.95	16.1	NA	NA	ND	ND	ND	0.05	ND
FLO-2 **VR**	USFS Pocket Recreation Area Well **Floyd**	02/14/08	5.15	10	NA	14.8	NA	NA	ND	ND	ND	0.24	0.02
FOR-1 **PBR**	Wood Creek S/D Well **Forsyth**	08/09/07	6.36	205	0.14	16.8	NA	NA	ND	ND	12	0.10	ND
FRA-1 **PBR**	Victoria Bryant SP Well #101 **Franklin**	01/24/08	6.04	34	NA	16.3	NA	NA	ND	ND	ND	ND	0.10

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
ECH-1 CP	ND	ND	ND	ND	13.0	ND	ND	ND	ND	24K	ND	ND	5100	13	2700	ND	ND
EFF-1 CP	ND	ND	ND	ND	15.0	ND	ND	ND	ND	31K	65	ND	7200	ND	11K	ND	ND
ELB-1 PBR	ND	ND	ND	ND	43.0	ND	ND	2.5	ND	20K	ND	ND	3600	ND	12K	ND	ND
EMA-1 CP	ND	ND	ND	ND	94.0	ND	ND	ND	ND	46K	ND	ND	ND	ND	2100	ND	ND
EMA-2 CP	ND	ND	ND	ND	110.0	ND	ND	ND	ND	39K	25	ND	4700	120	7000	ND	ND
EVA-1 CP	ND	ND	ND	ND	27.0	ND	ND	ND	ND	27K	29	ND	6200	14	15K	ND	ND
FAN-1 PBR	ND	ND	ND	ND	4.3	ND	ND	ND	60	11K	23	ND	1800	ND	4400	ND	ND
FAY-1 PBR	ND	ND	ND	ND	59	ND	ND	ND	250	14K	ND	ND	3200	ND	10K	ND	ND
FLO-1 VR	ND	ND	ND	ND	15.0	ND	ND	ND	ND	43K	ND	ND	7000	ND	1700	ND	ND
FLO-2 VR	ND	ND	ND	ND	4.0	ND	1.8	ND	320	1900	1100	ND	ND	ND	ND	ND	ND
FOR-1 PBR	ND	ND	ND	ND	12.0	ND	ND	2.5	ND	29K	180	ND	3700	62	8800	ND	ND
FRA-1 PBR	ND	ND	10	ND	5.6	ND	ND	ND	ND	7000	1100	ND	1100	30	5400	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
GIL-1 **PBR**	USACE Doll Mt. Campground Well **Gilmer**	07/11/07	7.84	156	0.18	16.1	NA	NA	ND	ND	ND	0.03	ND
GLA-1 **CP**	City of Mitchell Well #3 **Glascock**	05/24/07	4.48	27	NA	19.6	NA	NA	ND	ND	ND	2.20	ND
GLY-1 **CP**	Woodland MHP Well **Glynn**	09/19/07	7.79	275	NA	23.9	NA	NA	ND	21	79	ND	0.03
GLY-2 **CP**	Hofwyl-Broadfield Plantation SHS Well **Glynn**	11/14/07	7.96	329	NA	25.5	NA	NA	ND	26	110	ND	0.10
GRA-1 **CP**	Pinecrest MHP Well #2 **Grady**	06/05/07	7.87	188	5.24	22.2	NA	NA	ND	NA	NA	0.03	ND
GRE-1 **PBR**	City of White Plains Well #1 **Greene**	06/06/07	6.72	124	NA	19.1	60	80	ND	ND	ND	1.00	0.10
GRE-1RPT **PBR**	City of White Plains Well #1 **Greene**	08/23/07	6.88	137	NA	18.9	NA	NA	ND	ND	ND	1.20	0.09
HAB-1 **PBR**	Village MHP Well #1 **Habersham**	07/26/07	5.02	49	NA	16.2	NA	NA	ND	ND	ND	5.20	ND
HAL-1 **PBR**	Leisure Lake Village Well #1 **Hall**	07/12/07	7.55	268	0.22	17.8	NA	NA	ND	ND	52	ND	ND
HAN-1 **PBR**	Sheffield Landing S/D Well **Hancock**	12/13/07	6.55	163	NA	18.7	NA	NA	ND	ND	20	ND	0.07
HAS-1 **PBR**	Valley Inn Well **Harris**	04/26/07	6.49	164	1.12	18.9	NA	NA	ND	NA	NA	0.05	0.02
HAS-2 **PBR**	FDR SP Camp and Cottage Spring **Harris**	02/21/08	5.05	7	NA	16.3	NA	NA	ND	ND	ND	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
GIL-1 PBR	ND	ND	ND	ND	6.7	ND	1.2	ND	ND	23K	29	ND	2000	61	5900	ND	ND
GLA-1 CP	ND	ND	ND	ND	8.0	ND	ND	ND	ND	1100	ND	ND	ND	ND	4800	ND	ND
GLY-1 CP	ND	ND	ND	ND	47.0	ND	ND	ND	ND	40K	450	ND	26K	ND	20K	ND	ND
GLY-2 CP	ND	ND	ND	ND	45.0	ND	ND	ND	ND	44K	520	ND	27K	ND	27K	ND	ND
GRA-1 CP	ND	ND	11	ND	2.6	ND	ND	ND	ND	21K	ND	ND	12K	ND	2900	ND	ND
GRE-1 PBR	ND	ND	ND	6.7	6.9	ND	ND	41.0	ND	21K	ND	ND	7200	ND	13K	ND	ND
GRE-1RPT PBR	ND	ND	52	11.0	4.9	ND	ND	60.0	ND	23K	ND	ND	7500	ND	13K	ND	ND
HAB-1 PBR	ND	ND	14	ND	93.0	ND	ND	ND	110	2300	ND	ND	3000	90	7300	ND	ND
HAL-1 PBR	ND	ND	ND	ND	110.0	ND	ND	ND	ND	39K	22	ND	4300	ND	9400	ND	ND
HAN-1 PBR	ND	ND	500	ND	12.0	ND	ND	ND	ND	26K	750	ND	8400	270	16K	ND	ND
HAS-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	20K	ND	ND	2500	92	6800	ND	ND
HAS-2 PBR	ND	ND	ND	ND	10	ND	ND	ND	ND	ND	ND	ND	ND	ND	1000	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
HAT-1 **PBR**	Sanders MHP Spring **Hart**	07/11/07	4.66	23	NA	17.4	NA	NA	ND	ND	ND	1.40	ND
HOU-1 **CP**	City of Elko Well #1 **Houston**	06/07/07	7.13	224	1.81	19.4	NA	NA	ND	ND	ND	0.43	ND
IRW-1 **CP**	Irwinville Water Works, Inc. Well **Irwin**	03/28/07	7.64	149	NA	19.7	NA	NA	ND	ND	ND	ND	0.03
JAS-1 **PBR**	Martin's Marina Well **Jasper**	08/22/07	6.61	142	NA	19.1	NA	NA	ND	ND	ND	ND	ND
JDA-1 **CP**	S&E MHP **Jeff Davis**	03/27/07	7.79	164	NA	26.4	NA	NA	ND	ND	ND	ND	0.03
JEF-1 **CP**	City Bartow Well #1 **Jefferson**	05/24/07	7.35	206	NA	19.8	NA	NA	ND	ND	ND	ND	ND
JEF-2 **CP**	City of Avera Well **Jefferson**	12/13/07	6.80	115	NA	18.8	NA	NA	Chloroform = 0.62	ND	ND	0.03	0.05
JEN-1 **CP**	City of Perkins Well #1 **Jenkins**	04/10/07	7.80	152	NA	20.9	80	80	ND	ND	12	0.02	0.10
JOH-1 **CP**	Scott Water and Sewer Authority Well #1 **Johnson**	05/09/07	7.31	165	NA	21.1	NA	NA	ND	ND	ND	0.04	ND
JON-1 **CP**	Jones Acres MHP Well **Jones**	10/03/07	4.45	22	NA	19.3	NA	NA	ND	ND	ND	1.90	0.02
LAM-1 **PBR**	Fullers Community Park Well **Lamar**	10/25/07	6.99	111	NA	18.7	NA	NA	ND	ND	12	0.34	ND
LAN-1 **CP**	Westwind Farms Well #1 **Lanier**	11/29/07	7.69	191	NA	21.7	NA	NA	ND	ND	43	ND	0.04

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
HAT-1 PBR	ND	ND	ND	ND	28.0	ND	ND	ND	ND	1500	ND	ND	1100	33	3100	ND	ND
HOU-1 CP	ND	7.8	42	ND	7.4	ND	ND	ND	ND	46K	ND	ND	1300	ND	2400	ND	ND
IRW-1 CP	ND	ND	ND	ND	54.0	ND	ND	ND	ND	42K	ND	ND	4200	ND	2500	ND	ND
JAS-1 PBR	ND	ND	16	ND	ND	ND	ND	1.1	ND	32K	200	ND	5600	90	11K	ND	ND
JDA-1 CP	ND	ND	17	ND	290.0	ND	ND	ND	170	30K	160	ND	13K	ND	5800	ND	ND
JEF-1 CP	ND	ND	ND	ND	ND	ND	ND	ND	ND	67K	86	ND	2100	60	3200	ND	ND
JEF-2 CP	ND	ND	ND	ND	12.0	ND	ND	ND	ND	1200	430	ND	ND	ND	45K	ND	ND
JEN-1 CP	ND	ND	ND	ND	8.6	ND	ND	ND	ND	45K	190	ND	2000	51	3000	ND	ND
JOH-1 CP	ND	ND	ND	ND	140.0	ND	ND	ND	ND	54K	ND	ND	2000	ND	3000	ND	ND
JON-1 CP	ND	15	ND	ND	15.0	1.2	2.8	ND	180	1600	ND	ND	ND	ND	3900	ND	ND
LAM-1 PBR	ND	ND	ND	ND	ND	ND	ND	ND	ND	22K	ND	ND	4500	ND	9200	ND	ND
LAN-1 CP	ND	ND	ND	ND	31.0	ND	ND	ND	ND	38K	ND	ND	17K	ND	4500	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
LAU-1 **CP**	Shady Pines MHP Well #1 **Laurens**	08/09/07	7.30	218	NA	21.4	20	20	ND	ND	15	ND	0.03
LAU-2 **CP**	Old Coleman Street Well **Laurens**	10/24/07	7.45	140	NA	19.7	NA	NA	ND	ND	ND	0.95	0.03
LEE-1 **CP**	Weslo Estates Well #3 **Lee**	10/24/07	6.94	414	NA	20.4	NA	NA	ND	14	ND	10.00	ND
LIB-1 **CP**	Sasser's MHP Well **Liberty**	06/05/07	8.22	148	NA	23.5	NA	NA	ND	ND	16	ND	ND
LIB-2 **CP**	Fort Morris SHS Well **Liberty**	11/15/07	8.08	203	NA	23.0	NA	NA	ND	ND	42	ND	0.03
LIN-1 **PBR**	Fishing Creek RV and MHP Well **Lincoln**	07/11/07	7.18	71	NA	20.0	NA	NA	ND	ND	15	0.45	ND
LIN-1RPT **PBR**	Fishing Creek RV and MHP Well **Lincoln**	09/06/07	6.48	86	NA	18.4	100	100	ND	ND	18	0.41	0.08
LON-1 **CP**	Benton Bay MHP Well **Long**	06/05/07	7.91	177	NA	20.9	40	40	ND	ND	ND	ND	0.02
LOW-1 **CP**	Pecan Grove MHP West Well **Lowndes**	06/21/07	7.84	158	NA	22.2	NA	NA	ND	ND	19	ND	ND
LOW-2 **CP**	Ga. Sherriffs' Boys' Ranch Well **Lowndes**	1/30/08	7.56	137	NA	20.6	NA	NA	ND	ND	ND	ND	ND
LUM-1 **PBR**	Cane Creek Trailer Park Well **Lumpkin**	07/12/07	6.06	215	6.41	16.6	NA	NA	ND	ND	ND	4.30	ND
MCD-1 **CP**	221 Corral Well **McDuffie**	06/06/07	4.33	26	NA	19.4	NA	NA	ND	ND	ND	1.80	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
LAU-1 CP	ND	ND	17	ND	6.2	ND	ND	ND	ND	63K	31	ND	4400	ND	4000	ND	ND
LAU-2 CP	ND	ND	12	ND	78.0	ND	1.5	ND	ND	47K	ND	ND	ND	ND	1900	ND	ND
LEE-1 CP	ND	ND	ND	ND	9.5	ND	ND	ND	ND	85K	ND	ND	ND	ND	4400	ND	ND
LIB-1 CP	ND	ND	ND	ND	13.0	ND	ND	ND	ND	21K	76	ND	11K	ND	13K	ND	ND
LIB-2 CP	ND	ND	ND	ND	25.0	ND	ND	ND	ND	28K	150	ND	17K	ND	17K	ND	ND
LIN-1 PBR	ND	22	61	ND	8.9	ND	130.0	16.0	ND	15K	ND	ND	3300	ND	7700	ND	ND
LIN-1RPT PBR	ND	ND	20	ND	6.6	ND	1.2	19.0	ND	17K	ND	ND	3500	ND	7700	ND	ND
LON-1 CP	ND	ND	12	ND	18.0	ND	ND	ND	ND	46K	ND	ND	5600	15	12K	ND	ND
LOW-1 CP	ND	ND	ND	ND	21.0	ND	ND	ND	ND	33K	ND	ND	12K	11	3600	ND	ND
LOW-2 CP	ND	ND	ND	ND	25	ND	ND	ND	ND	27K	30	ND	11K	ND	3000	ND	ND
LUM-1 PBR	12	ND	ND	ND	10.0	ND	ND	ND	ND	25K	ND	ND	8100	ND	6600	ND	ND
MCD-1 CP	ND	ND	ND	ND	73.0	ND	ND	ND	90	1200	ND	ND	1300	23	2400	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. / Province	Well Name / County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
MCI-1 **CP**	Sapelo Gardens S/D Well #1 **McIntosh**	11/08/07	7.83	249	NA	25.0	NA	NA	ND	13	66	ND	ND
MCI-2 **CP**	Eulonia Community Well **McIntosh**	11/14/07	8.02	246	NA	25.3	NA	NA	ND	13	63	ND	0.06
MAC-1 **CP**	Whitewater Creek Park Well #1 **Macon**	03/15/07	5.68	59	NA	19.5	NA	NA	ND	ND	12	ND	0.26
MAD-1 **PBR**	City of Ila Well #1 **Madison**	10/04/07	7.29	116	NA	17.8	NA	NA	ND	ND	13	0.02	0.03
MAR-1 **CP**	Unimim Corporation Well #1 **Marion**	04/26/07	4.76	125	2.86	19.9	NA	NA	ND	NA	NA	0.26	ND
MER-1 **PBR**	Town of Lone Oak Well #1 **Meriwether**	08/23/07	5.19	132	8.88	20.7	NA	NA	ND	11	ND	1.40	0.06
MER-2 **PBR**	City of Gay Well #2 **Meriwether**	12/05/07	6.03	38	NA	16.8	NA	NA	ND	ND	ND	1.80	0.04
MIL-1 **CP**	City of Colquitt Well #3 **Miller**	03/14/07	7.40	146	NA	20.4	20	20	ND	NA	NA	2.20	ND
MIT-1 **CP**	Hinsonton Water System Well #1 **Mitchell**	05/09/07	7.87	242	1..69	22.2	NA	NA	ND	NA	NA	ND	0.09
MIT-2 **CP**	Maple New Hope Child Care Center Well **Mitchell**	11/28/07	7.32	220	NA	20.7	NA	NA	ND	ND	13	0.99	0.04
MON-1 **PBR**	City of Culloden Lockett Street Well **Monroe**	10/03/07	5.86	133	NA	18.8	90	90	ND	15	37	0.63	0.02
MOT-1 **CP**	Williams MHP Well #1 **Montgomery**	04/11/07	7.87	144	NA	22.0	NA	NA	ND	ND	ND	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
MCI-1 CP	ND	ND	12	ND	58.0	ND	ND	ND	ND	36K	340	ND	23K	ND	19K	ND	ND
MCI-2 CP	ND	ND	ND	ND	54.0	ND	ND	ND	390	34K	43	ND	22K	ND	19K	ND	ND
MAC-1 CP	ND	ND	ND	ND	51.0	ND	ND	ND	ND	6800	1000	ND	ND	18	1200	ND	ND
MAD-1 PBR	ND	ND	12	ND	5.9	ND	ND	ND	ND	24K	590	ND	4400	150	10K	ND	ND
MAR-1 CP	ND	ND	ND	ND	4.5	ND	ND	ND	ND	ND	ND	ND	ND	ND	25K	ND	ND
MER-1 PBR	ND	9.0	48	ND	29.0	ND	ND	ND	84	14K	ND	ND	1800	ND	11K	ND	ND
MER-2 PBR	ND	ND	ND	ND	48.0	ND	ND	ND	ND	4000	53	ND	ND	ND	6900	ND	ND
MIL-1 CP	ND	ND	ND	ND	4.7	ND	ND	ND	ND	49K	ND	ND	ND	ND	2300	ND	ND
MIT-1 CP	ND	ND	ND	ND	240.0	ND	1.1	4.8	ND	22K	ND	ND	16K	ND	5700	ND	13
MIT-2 CP	ND	ND	ND	ND	19.0	ND	ND	ND	ND	63K	ND	ND	4900	ND	3700	ND	ND
MON-1 PBR	ND	ND	120	ND	29.0	ND	2.1	ND	ND	20K	49	ND	6000	100	12K	ND	ND
MOT-1 CP	ND	ND	ND	ND	300.0	ND	ND	ND	ND	33K	42	ND	4200	54	11K	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity		VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
							bg.	water					
MOR-1 **PBR**	Triple B Restaurant Well **Morgan**	08/08/07	6.68	85	NA	21.1	NA	NA	ND	ND	ND	1.50	0.07
MUR-1 **PBR**	Fort Mt. Estates Well **Murray**	07/11/07	5.19	69	NA	13.8	NA	NA	ND	13	ND	0.24	ND
MUS-1 **CP**	Carmouche Range Well **Muscogee**	04/25/07	4.39	15	7.88	21.1	NA	NA	ND	NA	NA	0.05	ND
NEW-1 **PBR**	Oak Forest MHP Main Well **Newton**	07/12/07	7.35	97	NA	18.2	NA	NA	ND	ND	12	ND	0.03
OCO-1 **PBR**	Apalachee Pointe S/D Well #1 **Oconee**	08/23/07	7.17	101	NA	17.8	NA	NA	ND	ND	11	0.12	0.05
OGL-1 **PBR**	Smokey Road Water System Well #1 **Oglethorpe**	06/06/07	6.71	102	NA	18.1	NA	NA	Toluene = 1.9 Chloroform = 0.68	ND	ND	2.30	0.68
PAU-1 **PBR**	City of Hiram Well #2 **Paulding**	08/16/07	5.32	157	4.03	17.8	NA	NA	ND	ND	ND	1.40	0.02
PEA-1 **CP**	Rolling Hills MHP Well #1 **Peach**	03/15/07	4.09	23	7.37	19.4	NA	NA	ND	ND	ND	0.82	ND
PIC-1 **VR**	SharpTop Cove Well #1 **Pickens**	08/09/07	5.84	124	NA	16.3	NA	NA	Chloroform = 0.91	ND	15	0.11	ND
PIE-1 **CP**	Martin MHP Well #2 **Pierce**	10/18/07	7.55	200	NA	21.8	NA	NA	ND	13	ND	ND	0.02
PIK-1 **PBR**	City of Molena Well #3 **Pike**	08/22/07	5.50	123	0.00	18.2	NA	NA	ND	ND	15	0.12	0.02
PIK-1RPT **PBR**	City of Molena Well #3 **Pike**	12/05/07	6.33	75	NA	18.0	NA	NA	ND	ND	15	0.07	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
MOR-1 **PBR**	ND	15	25	ND	21.0	ND	ND	1.3	ND	20K	ND	ND	3000	ND	9400	ND	ND
MUR-1 **PBR**	ND	ND	950	ND	16.0	ND	2.4	ND	ND	5400	ND	ND	1800	ND	5000	ND	ND
MUS-1 **CP**	ND	6.5	ND	ND	12.0	ND	1.4	ND	ND	ND	34	ND	ND	ND	ND	ND	ND
NEW-1 **PBR**	ND	ND	ND	ND	2.9	ND	ND	ND	ND	20K	230	ND	3200	120	8800	ND	ND
OCO-1 **PBR**	ND	ND	ND	ND	8.6	ND	ND	ND	84	21K	40	ND	2800	73	8400	ND	ND
OGL-1 **PBR**	ND	ND	52	ND	12.0	ND	5.9	13.0	64	24K	360	ND	3000	ND	5200	ND	ND
PAU-1 **PBR**	ND	ND	52	ND	10.0	ND	ND	ND	ND	14K	ND	ND	9700	ND	6800	ND	ND
PEA-1 **CP**	ND	6.9	34	ND	5.5	ND	1.0	ND	ND	ND	50	ND	ND	ND	2300	ND	ND
PIC-1 **VR**	ND	ND	15	ND	13.0	ND	ND	ND	ND	20K	2700	ND	1500	28	4100	ND	ND
PIE-1 **CP**	ND	ND	23	ND	11.0	ND	ND	ND	ND	31K	110	ND	14K	ND	23K	ND	ND
PIK-1 **PBR**	ND	ND	23	ND	20.0	ND	ND	37.0	ND	11K	41	ND	3000	99	7100	ND	ND
PIK-1RPT **PBR**	ND	ND	21	ND	18.0	ND	ND	37.0	ND	11K	45	ND	3000	97	7300	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
POL-1 **VR**	City of Rockmart Plum Street Well **Polk**	08/16/07	7.81	259	NA	17.8	NA	NA	ND	ND	ND	0.54	ND
PUL-1 **CP**	Hartford Water Authority Well **Pulaski**	03/29/07	6.98	150	NA	22.2	NA	NA	ND	ND	14	ND	0.05
PUT-1 **PBR**	Deer Run MHP Well #2 **Putnam**	08/08/07	6.87	112	NA	18.8	NA	NA	ND	ND	ND	1.10	0.04
QUI-1 **CP**	Bonaparte's Retreat Well **Quitman**	03/15/07	8.75	405	NA	27.5	NA	NA	ND	ND	ND	0.02	0.07
RAB-1 **PBR**	Dillard Holiday Inn Express Well **Rabun**	09/05/07	7.30	61	NA	16.0	NA	NA	ND	ND	12	ND	ND
RAN-1 **CP**	City of Shellman Pearl Street Well **Randolph**	03/15/07	7.30	192	NA	20.3	NA	NA	ND	ND	14	ND	ND
RIC-1 **CP**	Heritage MHP North Well **Richmond**	08/08/07	4.46	12	NA	21.3	NA	NA	ND	ND	ND	1.10	ND
ROC-1 **PBR**	Hi Roc Shores Front Well **Rockdale**	08/23/07	5.43	56	NA	18.2	NA	NA	MTBE=0.99	ND	ND	1.60	ND
SCR-1 **CP**	City of Hiltonia Well **Screven**	04/10/07	7.68	174	NA	20.8	NA	NA	ND	ND	10	ND	ND
SCR-2 **CP**	Lawton Place MHP Well **Screven**	12/12/07	7.69	170	NA	20.1	NA	NA	ND	ND	ND	0.85	0.09
SEM-1 **CP**	Paradise Acres Well #102 **Seminole**	05/09/07	7.25	246	5.42	22.2	NA	NA	ND	NA	NA	2.40	ND
STE-1 **PBR**	Lake Harbor Shores Well #4 **Stephens**	09/05/07	6.36	103	NA	17.4	60	60	ND	ND	ND	0.09	0.03

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
POL-1 VR	ND	ND	ND	ND	20.0	ND	ND	ND	ND	41K	ND	ND	11K	ND	2100	ND	ND
PUL-1 CP	ND	ND	ND	ND	47.0	ND	ND	ND	ND	47K	980	ND	1500	21	1700	ND	ND
PUT-1 PBR	ND	ND	ND	ND	14.0	ND	1.1	ND	ND	24K	ND	ND	1100	ND	14K	ND	ND
QUI-1 CP	ND	13	14	ND	15.0	ND	ND	ND	ND	1300	ND	ND	3900	ND	160K	ND	ND
RAB-1 PBR	ND	6.6	250	ND	ND	ND	2.5	2.6	ND	11K	920	ND	1500	13	7100	ND	ND
RAN-1 CP	ND	13	14	ND	15.0	ND	ND	ND	ND	58K	ND	ND	3900	ND	3500	ND	ND
RIC-1 CP	ND	5.7	ND	ND	4.0	ND	15.0	ND	ND	ND	ND	ND	ND	ND	1900	ND	ND
ROC-1 PBR	ND	ND	16	ND	35.0	ND	ND	ND	ND	7600	ND	ND	1900	120	5900	ND	ND
SCR-1 CP	ND	ND	ND	ND	ND	ND	ND	ND	ND	50K	ND	ND	3300	ND	3500	ND	ND
SCR-2 CP	ND	ND	ND	ND	45.0	ND	ND	ND	ND	54K	ND	ND	2900	ND	4200	ND	ND
SEM-1 CP	ND	ND	ND	ND	4.0	ND	ND	ND	ND	49K	ND	ND	ND	ND	2100	ND	ND
STE-1 PBR	ND	ND	21	ND	21.0	ND	ND	3.5	ND	18K	ND	ND	7000	ND	8700	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity		VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
							bg.	water					
STW-1 **CP**	Louvale Community Well #1 **Stewart**	03/15/07	5.65	70	NA	19.0	NA	NA	ND	ND	ND	ND	0.03
STW-2 **CP**	Providence Canyon S.P. Well **Stewart**	02/21/08	6.83	107	NA	20.4	NA	NA	ND	ND	12	ND	0.17
SUM-1 **CP**	Briar Patch MHP Well **Sumter**	03/14/07	4.11	70	5.42	20.3	NA	NA	MTBE=0.80	14	ND	1.60	ND
SUM-2 **CP**	City of Andersonville Well **Sumter**	12/20/07	4.38	82	NA	19.3	NA	NA	ND	ND	36	0.31	ND
TAL-1 **CP**	Junction City Well #2 **Talbot**	08/23/07	7.99	203	0.12	21.5	NA	NA	ND	ND	36	ND	ND
TAI-1 **PBR**	A. H. Stephens S. P. Well **Taliaferro**	01/23/08	6.33	248	NA	17.5	NA	NA	ND	10	ND	ND	ND
TAT-1 **CP**	City of Collins Well B **Tattnal**	04/11/07	8.06	144	NA	24.0	NA	NA	ND	ND	ND	ND	0.04
TAT-2 **CP**	Rotary Corporation Well **Tattnal**	12/04/07	8.05	145	NA	24.0	NA	NA	ND	ND	ND	ND	NA
TAY-1 **CP**	Potterville Community Well #1 **Taylor**	08/23/07	3.65	24	6.07	19.3	NA	NA	ND	ND	ND	0.25	0.18
TEL-1 **CP**	City of Jacksonville Well #1 **Telfair**	03/29/07	7.97	128	NA	21.4	NA	NA	ND	ND	ND	ND	0.03
TER-1 **CP**	Terrell Co. Head Start Well **Terrell**	06/06/07	7.44	244	0.11	22.0	NA	NA	ND	NA	NA	ND	ND
THO-1 **CP**	Carter MHP Well #1 **Thomas**	3/14/07	7.26	301	0.97	20.8	NA	NA	ND	ND	ND	0.02	0.02

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
STW-1 CP	ND	5.4	13	ND	11.0	ND	ND	ND	ND	ND	790	ND	ND	ND	27K	ND	ND
STW-2 CP	ND	ND	450	ND	6.7	ND	ND	ND	80	21K	480	ND	1100	ND	9300	ND	ND
SUM-1 CP	ND	5.4	15	ND	16.0	ND	ND	ND	ND	ND	ND	ND	ND	25	11K	ND	ND
SUM-2 CP	ND	ND	41	ND	60	ND	1.1	ND	570	12K	160	ND	4200	46	2600	ND	ND
TAL-1 CP	ND	ND	ND	ND	5.3	ND	ND	ND	110	14K	ND	ND	ND	ND	28K	ND	ND
TAI-1 PBR	ND	ND	2200	ND	140	ND	2	ND	ND	54K	2800	ND	7800	410	15K	ND	ND
TAT-1 CP	ND	ND	ND	ND	ND	ND	ND	ND	ND	25K	ND	ND	8200	ND	14K	ND	ND
TAT-2 CP	ND	ND	ND	ND	6.3	ND	ND	ND	ND	22K	45	ND	7900	ND	20K	ND	ND
TAY-1 CP	ND	ND	10	ND	2.7	ND	ND	ND	ND	ND	100	ND	ND	ND	1500	ND	ND
TEL-1 CP	ND	ND	ND	ND	150.0	ND	ND	ND	ND	25K	280	ND	11K	20	2900	ND	ND
TER-1 CP	ND	ND	ND	ND	7.1	ND	ND	ND	ND	38K	10	ND	5300	ND	7000	ND	ND
THO-1 CP	ND	ND	15	ND	19.0	ND	ND	ND	ND	40K	ND	ND	20K	ND	3900	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
THO-2 **CP**	Waverly/Four Corners **Thomas**	1/30/08	7.65	166	NA	25.4	NA	NA	ND	ND	ND	ND	ND
TIF-1 **CP**	Forest Lakes S/D Well #1 **Tift**	05/10/07	7.50	262	0.01	22.2	NA	NA	ND	ND	ND	ND	ND
TOO-1 **CP**	Shady Acres MHP Well **Toombs**	05/23/07	7.94	122	NA	22.9	40	40	ND	ND	ND	ND	0.05
TOW-1 **PBR**	Brasstown Bald Spring **Towns**	09/05/07	5.34	7	NA	13.4	NA	NA	ND	ND	ND	0.32	ND
TRE-1 **CP**	City of Soperton Well #1 **Treutlen**	04/11/07	7.53	203	NA	21.3	NA	NA	ND	ND	ND	ND	0.02
TRO-1 **PBR**	Rosemont Elementary School Well **Troup**	04/26/07	5.75	144	0.06	18.9	NA	NA	MTBE=0.92	NA	NA	0.02	0.12
TUR-1 **CP**	Ashburn-Turner Co. Recreation Well **Turner**	05/10/07	7.68	158	0.54	20.8	NA	NA	ND	ND	ND	ND	ND
TWI-1 **CP**	Twiggs Co.-Black Bottom Well #1 **Twiggs**	05/10/07	5.11	13	NA	18.4	NA	NA	ND	ND	ND	0.35	ND
UNI-1 **PBR**	Bryant Cove S/D Well #2 **Union**	08/08/07	6.67	101	2.8	16.3	NA	NA	ND	ND	ND	ND	0.02
UPS-1 **PBR**	Country Village S/D Well #13 **Upson**	08/22/07	6.85	163	1.37	19.2	NA	NA	ND	ND	ND	0.08	0.06
WAL-1 **VR**	Valley View Ranch Field Well **Walker**	08/01/07	4.85	18	5.56	16.7	NA	NA	ND	ND	ND	0.22	ND
WAT-1 **PBR**	City of Jersey Water Tank Road Well **Walton**	08/23/07	6.34	60	NA	22.6	NA	NA	ND	ND	ND	1.50	0.03

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
THO-2 CP	ND	ND	ND	ND	130	ND	ND	ND	210	21K	ND	ND	14K	ND	14K	ND	ND
TIF-1 CP	ND	ND	ND	ND	220.0	ND	ND	ND	ND	42K	200	ND	7800	46	3000	ND	ND
TOO-1 CP	ND	ND	ND	ND	89.0	ND	ND	ND	ND	27K	56	ND	3100	16	14K	ND	ND
TOW-1 PBR	ND	ND	ND	ND	4.2	ND	ND	ND	ND	ND	ND	ND	ND	ND	1200	ND	ND
TRE-1 CP	ND	ND	ND	ND	290.0	ND	ND	ND	ND	53K	ND	ND	9400	150	7000	ND	ND
TRO-1 PBR	ND	ND	21	ND	7.2	ND	ND	ND	ND	13K	1700	ND	2500	79	8700	ND	ND
TUR-1 CP	ND	ND	17	ND	48.0	ND	ND	1.1	ND	30K	ND	ND	1300	ND	1700	ND	ND
TWI-1 CP	ND	ND	ND	ND	8.1	ND	1.1	ND	ND	2000	39	ND	ND	ND	1400	ND	ND
UNI-1 PBR	ND	ND	51	ND	11.0	ND	1.0	ND	ND	41K	ND	ND	1300	ND	2100	ND	ND
UPS-1 PBR	ND	5.5	10	ND	4.2	ND	1.0	ND	61	22K	ND	ND	3900	ND	6400	ND	ND
WAL-1 VR	ND	8	ND	ND	10.0	ND	3.1	ND	95	1100	87	ND	ND	35	1300	ND	ND
WAT-1 PBR	ND	ND	91	ND	ND	ND	ND	9.2	94	8300	ND	ND	4200	ND	5200	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity bg.	Radioactivity water	VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
WAE-1 **CP**	Baptist Village Well #1 **Ware**	09/20/07	7.68	232	NA	23.6	NA	NA	ND	15	35	ND	0.04
WAE-2 **CP**	City of Manor Well **Ware**	11/08/07	7.70	260	NA	24.7	NA	NA	ND	12	77	ND	ND
WAN-1 **PBR**	Camak Quarry Well #1 **Warren**	07/12/07	6.54	118	NA	18.6	100	100	ND	ND	ND	0.02	ND
WAS-1 **CP**	City of Harrison Well #1 **Washington**	05/09/07	7.34	170	NA	19.8	NA	NA	ND	ND	ND	0.22	ND
WAS-2 **CP**	City of Riddleville Well #1 **Washington**	1/31/08	7.60	183	NA	19.4	NA	NA	ND	ND	ND	0.08	ND
WAY-1 **CP**	Raintree Trailer Park Main Well **Wayne**	09/19/07	7.80	129	NA	21.8	NA	NA	ND	ND	ND	ND	0.08
WAY-2 **CP**	City of Odum Well #1 **Wayne**	11/14/07	8.08	185	NA	25.6	NA	NA	ND	ND	23	ND	ND
WEB-1 **CP**	City of Weston Well #1 **Webster**	06/19/07	6.95	300	1.38	19.9	NA	NA	ND	ND	0	0.34	ND
WHE-1 **CP**	City of Alamo Well #1 **Wheeler**	05/09/07	7.61	179	NA	22.2	NA	NA	ND	ND	ND	ND	ND
WHI-1 **PBR**	Sweetwater Coffeehouse Well **White**	07/12/07	5.99	88	4.37	16.3	NA	NA	ND	ND	ND	0.70	ND
WHT-1 **VR**	Prospect Crossing S/D Well **Whitfield**	08/10/07	7.04	346	0.01	17.1	NA	NA	ND	ND	ND	0.03	ND
WIL-1 **CP**	City of Pineview Well #1 **Wilcox**	03/29/07	7.57	165	NA	20.5	NA	NA	ND	ND	12	0.71	0.03

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
WAE-1 CP	ND	ND	ND	ND	51.0	ND	ND	ND	ND	40K	44	ND	17K	ND	17K	ND	ND
WAE-2 CP	ND	ND	11	ND	56.0	ND	ND	ND	ND	48K	100	ND	20K	21	12K	ND	ND
WAN-1 PBR	ND	ND	ND	ND	5.7	ND	ND	1.5	ND	14K	280	ND	5000	110	22K	ND	ND
WAS-1 CP	ND	ND	ND	ND	100.0	ND	1.1	ND	ND	52K	ND	ND	2000	ND	3000	ND	ND
WAS-2 CP	ND	ND	11	ND	35	ND	ND	ND	ND	61K	74	ND	1200	ND	2500	ND	ND
WAY-1 CP	ND	ND	ND	ND	30.0	ND	ND	ND	ND	25K	ND	ND	8900	110	11K	ND	ND
WAY-2 CP	ND	ND	ND	ND	75.0	ND	ND	ND	ND	27K	ND	ND	14K	ND	18K	ND	ND
WEB-1 CP	ND	ND	ND	ND	22.0	ND	ND	ND	ND	62K	ND	ND	1600	ND	1700	ND	ND
WHE-1 CP	ND	ND	ND	ND	190.0	ND	ND	ND	ND	43K	200	ND	9600	81	3500	ND	ND
WHI-1 PBR	ND	ND	ND	ND	72.0	ND	ND	ND	64	7900	350	ND	1500	10	8700	ND	ND
WHT-1 VR	ND	ND	26	ND	170.0	ND	ND	ND	ND	37K	ND	ND	23K	ND	1600	ND	ND
WIL-1 CP	ND	ND	ND	ND	29.0	ND	ND	ND	ND	55K	140	ND	1500	13	2000	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part A: Station Identification and Location, Date of Sampling, Field Parameters, VOCs, Anions, and Non-Metals.

Station No. Province	Well Name County	Date Sampled	pH	cond. uS/cm	diss O_2	Temp °C	Radioactivity		VOCs ppb	Cl ppm	SO4 ppm	NOx ppm N	P ppm
							bg.	water					
WKE-1 **PBR**	City of Rayle Well #1 **Wilkes**	06/07/07	6.23	91	NA	18.5	NA	NA	ND	11	ND	3.90	0.13
WIN-1 **CP**	City of Allentown Old Well **Wilkinson**	05/10/07	6.72	112	NA	20.8	NA	NA	ND	ND	13	ND	ND
WOR-1 **CP**	City of Warwick Well #1 **Worth**	11/07/07	7.43	179	NA	20.4	NA	NA	ND	ND	ND	2.00	ND
WOR-2 **CP**	City of Sumner Well #1 **Worth**	11/06/07	7.36	207	NA	21.7	NA	NA	ND	ND	ND	ND	ND

Table A-1. Ground-Water Quality Analyses for Statewide Small Public Water Systems.
Part B: Metals.

Station No. Province	Cr ppb	Cu ppb	Zn ppb	Mo ppb	Ba ppb	Tl ppb	Pb ppb	U ppb	Al ppb	Ca ppb	Fe ppb	K ppb	Mg ppb	Mn ppb	Na ppb	Ti ppb	V ppb
WKE-1 PBR	ND	ND	12	ND	43.0	ND	ND	ND	ND	15K	ND	ND	1900	ND	11K	ND	ND
WIN-1 CP	ND	ND	ND	ND	12.0	ND	ND	ND	ND	34K	380	ND	1100	ND	2400	ND	ND
WOR-1 CP	ND	ND	ND	ND	2.3	ND	ND	ND	ND	36K	ND	ND	2600	ND	3700	ND	ND
WOR-2 CP	ND	ND	ND	ND	200.0	ND	ND	ND	ND	48K	73	ND	16K	30	4600	ND	ND

TABLE A-2. CHEMICAL COMPONENTS AND REPORTING LIMITS

Component	Reporting Limit	Component	Reporting Limit
Vinyl Chloride	0.5 ppb	Dichlorodifluoro-methane	0.5 ppb
1,1-Dichloroethylene	0.5 ppb	Chloromethane	0.5 ppb
Dichloromethane	0.5 ppb	Bromomethane	0.5 ppb
Trans-1,2-Dichloroethylene	0.5 ppb	Chloroethane	0.5 ppb
Cis-1,2-Dichloroethylene	0.5 ppb	Fluorotrichloro-methane	0.5 ppb
1,1,1-Trichloroethane	0.5 ppb	1,1-Dichloroethane	0.5 ppb
Carbon Tetrachloride	0.5 ppb	2,2-Dichloropropane	0.5 ppb
Benzene	0.5 ppb	Bromochloro-methane	0.5 ppb
1,2-Dichloroethane	0.5 ppb	Chloroform	0.5 ppb
Trichloroethylene	0.5 ppb	1,1-Dichloropropene	0.5 ppb
1,2-Dichloropropane	0.5 ppb	Dibromomethane	0.5 ppb
Toluene	0.5 ppb	Bromodichloro-methane	0.5 ppb
1,1,2-Trichloroethane	0.5 ppb	Cis-1,3-Dichloropro-pene	0.5 ppb
Tetrachloroethylene	0.5 ppb	Trans-1,3-Dichloropropene	0.5 ppb
Chlorobenzene	0.5 ppb	1,3-Dichloropropane	0.5 ppb
Ethylbenzene	0.5 ppb	Chlorodibromo-methane	0.5 ppb
Total Xylenes	0.5 ppb	1,2-Dibromoethane	0.5 ppb
Styrene	0.5 ppb	1,1,1,2-Tetrachloroethane	0.5 ppb
p-Dichlorobenzene	0.5 ppb	Bromoform	0.5 ppb
o-Dichlorobenzene	0.5 ppb	Isopropylbenzene	0.5 ppb
1,2,4-Trichlorobenzene	0.5 ppb	1,1,2,2-Tetrachloroethane	0.5 ppb

TABLE A-2. CHEMICAL COMPONENTS AND REPORTING LIMITS, CONTINUED.

Component	Reporting Limit	Component	Reporting Limit
Bromobenzene	0.5 ppb	Silver (ICP)	10 ppb
1,2,3-Trichloropropane	0.5 ppb	Aluminum (ICP)	60 ppb
n-Propylbenzene	0.5 ppb	Arsenic (ICP)	80 ppb
o-Chlorotoluene	0.5 ppb	Barium (ICP)	10 ppb
1,3,5-Trimethylbenzene	0.5 ppb	Beryllium (ICP)	10 ppb
p-Chlorotoluene	0.5 ppb	Calcium (ICP)	2000 ppb
Tert-Butylbenzene	0.5 ppb	Cobalt (ICP)	10 ppb
1,2,4-Trimethylbenzene	0.5 ppb	Chromium (ICP)	20 ppb
Sec-Butylbenzene	0.5 ppb	Copper (ICP)	20 ppb
p-Isopropyltoluene	0.5 ppb	Iron (ICP)	20 ppb
m-Dichlorobenzene	0.5 ppb	Potassium (ICP)	5000 ppb
n-Butylbenzene	0.5 ppb	Magnesium (ICP)	1000 ppb
1,2-Dibromo-3-chloropropane	0.5 ppb	Manganese (ICP)	10 ppb
Hexachlorobutadi-ene	0.5 ppb	Sodium (ICP)	1000 ppb
Naphthalene	0.5 ppb	Nickel (ICP)	20 ppb
1,2,3-Trichlorobenzene	0.5 ppb	Lead (ICP)	90 ppb
Methyl-tert-butyl ether (MTBE)	0.5 ppb	Antimony (ICP)	120 ppb
Chloride	10 ppm	Selenium (ICP)	190 ppb
Sulfate	10 ppm	Titanium (ICP)	10 ppb
Nitrate/nitrite	0.02 ppm as Nitrogen	Thallium (ICP)	200 ppb
Total Phosphorus	0.02 ppm	Vanadium (ICP)	10 ppb

TABLE A-2. CHEMICAL COMPONENTS AND REPORTING LIMITS, CONTINUED.

Component	Reporting Limit	Component	Reporting Limit
Zinc (ICP)	20 ppb	Silver (ICP/MS)	5 ppb
Chromium (ICP/MS)	5 ppb	Cadmium (ICP/MS)	0.7 ppb
Nickel (ICP/MS)	10 ppb	Tin (ICP/MS)	30 ppb
Copper (ICP/MS)	5 ppb	Antimony (ICP/MS)	5 ppb
Zinc (ICP/MS)	10 ppb	Barium (ICP/MS)	2 ppb
Arsenic (ICP/MS)	5 ppb	Thallium (ICP/MS)	1 ppb
Selenium (ICP/MS)	5 ppb	Lead (ICP/MS)	1 ppb
Molybdenum (ICP/MS)	5 ppb	Uranium (ICP/MS)	1 ppb