GROUND-WATER QUALITY AND AVAILABILITY IN GEORGIA FOR 1985

by

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GEORGIA DEPARTMENT OF NATURAL RESOURCES
ENVIRONMENTAL PROTECTION DIVISION
GEORGIA GEOLOGIC SURVEY

CIRCULAR 12B

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INTRODUCTION

PURPOSE

This circular is the second of a series of annual reports of ground-water quality and availability in Georgia. The State's Ground-Water Management Plan requires that a summary of ground-water occurrence be prepared each year for review by the Assistant Director of the Georgia Environmental Protection Division (EPD), the State agency responsible for managing ground-water quality and allocation. Any adverse trends of ground-water degradation that are recognized through these reports will be used to direct EPD ground-water management activities. EPD currently manages the State's ground-water resources by issuing permits for municipal and large industrial withdrawals, wastewater discharges, sanitary landfills, and facilities that handle hazardous materials, as well as monitoring potential sources of ground-water pollution.

For this report, ground-water availability data were derived from the Water Use Program, a cooperative project of the Georgia Geologic Survey Branch of EPD and the U.S. Geological Survey. Ground-water quality data were taken from analyses for the Georgia Ground-Water Monitoring Network, maintained by the Georgia Geologic Survey.

HYDROGEOLOGIC PROVINCES OF GEORGIA

Three generalized hydrogeologic provinces occur within the State: the Coastal Plain Province of south Georgia, the Piedmont/Blue Ridge Province of north Georgia, and the Valley and Ridge/Cumberland Plateau Province of northwest Georgia (refer to Figure 1-1). Ground-water flow in the Coastal Plain is characterized by flow through porous media. Confined and unconfined aquifers are present. In both hydrogeologic provinces of north Georgia, ground-water

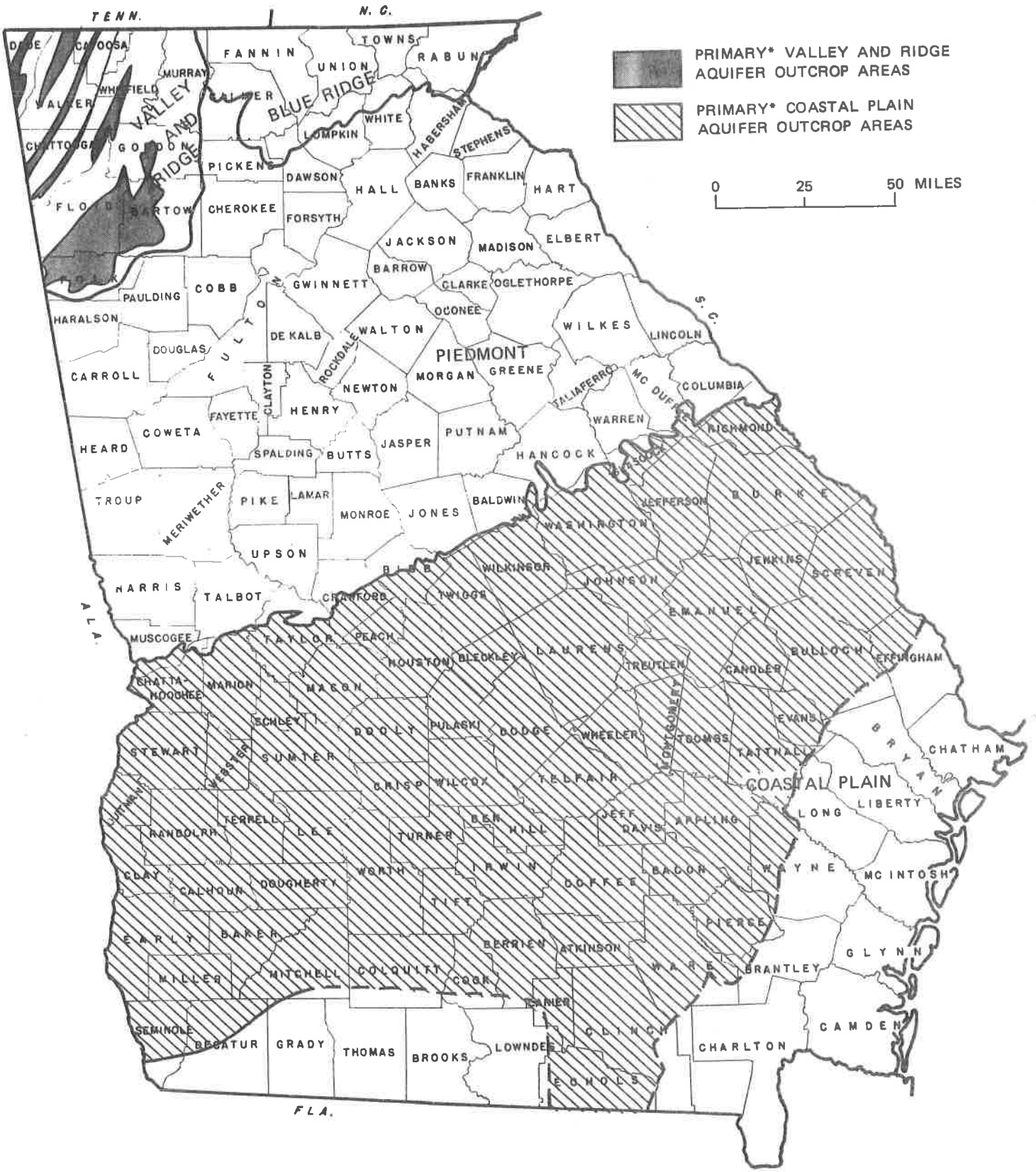


Figure 1-1: Generalized Hydrogeologic Provinces of Georgia
(With Primary Aquifer Outcrop Areas)

*Primary aquifers are those capable of supplying sufficient quantities of water for municipal and large industrial withdrawals.

flow is primarily controlled by fractures/dissolution channels; in these areas, aquifers are largely unconfined.

Georgia's Coastal Plain Province is underlain by a wedge of loosely consolidated sediments that gently dip and thicken to the south and east. The oldest sedimentary formations (Cretaceous age) crop out along the Fall Line, the northern limit of the Coastal Plain Province. Successively younger formations occur to the south. Ground-water flow generally follows the direction of dip of the formations.

Horizontal and vertical changes in lithology and ground-water quality limit the extent of aquifers in the Coastal Plain. Most recharge occurs in outcrop areas, where the aquifers are locally unconfined. Seven general, confined aquifer systems are present. The Cretaceous and Jacksonian aquifer systems (primarily sands) are used principally within a 35-mile-wide band that lies adjacent to the Fall Line. A large area of south-central and southeastern Georgia is underlain by the Floridan aquifer system (limestones). Southwestern Georgia relies on four vertically stacked aquifers (sands and limestones) for drinking water supplies: the Providence, Clayton, Claiborne, and Floridan aquifer systems. The Miocene aquifer system (sands and limestones) is the shallowest aquifer underlying most of the central and eastern Coastal Plain.

Crystalline rocks of metamorphic and igneous origin (primarily of Paleozoic age) occur in the Piedmont/Blue Ridge hydrogeologic province. The major water-bearing features are rock fractures and soil/saprolite horizons. Groundwater and surface-water regimes are often closely connected. The aquifer systems tend to be relatively small as they are limited by the topography of the related surface drainage basins.

The Valley and Ridge/Cumberland Plateau hydrogeologic province is underlain by consolidated sedimentary formations of Paleozoic age. Dolostones and limestones of the Knox Group and the Chickamauga Group, when they occur in the

axes of broad valleys, are the principal aquifers used in the province. Ground-water flow is strongly influenced by fractures and dissolution cavities that have developed along folds and faults and parallel to bedding. Ground-water and surface-water systems are generally closely interconnected. These aquifers, however, are not as strictly controlled by the topography of surface drainage basins as are the aquifers of the Piedmont/Blue Ridge hydrogeologic province.

GROUND-WATER OCCURRENCE

Ground-water quality is characteristically excellent state-wide. Of the thousands of wells constructed in the State, only a very few have ever experienced any water-quality problems. The only common contaminants found in Georgia's ground waters being used for consumption, in concentrations that exceed drinking-water standards, are iron and manganese. These two naturally but sporadically occurring materials, however, are readily removed during the treatment process.

Previous studies by EPD (Cressler, et al, 1983) indicate that many of the water quality problems in Georgia are not as much a problem with the ground water but rather a problem with the well. In some cases, the wells provide a pathway for pollutants to enter the ground-water regime. With passage and implementation of the Water Well Standards Act of 1985, which requires the grouting of all new wells and the plugging of abandoned wells, this pathway should be of lesser importance in the future.

Ground-water contamination and pollution rarely occur in north Georgia; no areally extensive incidents of ground-water degradation are known. Waters containing high total dissolved solids are present in the deepest aquifers underlying most of the Coastal Plain. High total dissolved solids levels also are present in the Floridan aquifer system in the coastal counties. Shallower aquifers, with acceptable water quality, nevertheless, are present almost everywhere.

A linear hydrogeologic anomaly of the Coastal Plain, known as the Gulf Trough, extends from Grady and Thomas Counties northeast to Montgomery County. In the Gulf Trough, both ground-water availability and quality are adversely affected. The porosity of aquifers of the area is less than adjacent areas; therefore, well yields are substantially lower. Ground-water contaminants in the area of the Gulf Trough include barium, total dissolved solids, and radionuclides. These contaminants, however, can be eliminated from drinking water by proper well construction (i.e. casing off certain geologic horizons) or treatment.

EPD has identified two critical use areas, in which increased withdrawals could affect ground-water quality in the Coastal Plain. Further withdrawals for agricultural irrigation in the Dougherty Plain of southwest Georgia will potentially increase hydraulic gradients through the vadose zone. Agricultural chemicals may not be effectively attenuated because of increased ground-water flow rates. Ground-water withdrawals for municipal and industrial use in the coastal counties locally have created large cones of depression in the potentiometric surface of the Floridan aquifer system. These cones of depression increase the potential for contamination from deeply buried brines as well as ocean water. Both areas are being closely monitored by EPD, each having a dense network of monitoring wells. Ground-water quality monitoring by EPD in the Dougherty Plain has not detected any traces of pesticides. Except for a small area on the Brunswick Peninsula, where upconing apparently has been ongoing for several decades, EPD's monitoring shows no evidence of further salt-water upconing or encroachment in coastal Georgia.

GROUND-WATER USE IN GEORGIA, 1985

INTRODUCTION

The Georgia Water Use Program, a cooperative project of the Georgia Geologic Survey and the U.S. Geological Survey, estimates total ground-water use in Georgia for 1985 to be 1,063 million gallons per day (mgd). This was 47% of the total water use for the State if cooling water for thermoelectric power generation is excluded. Approximately 90% of the ground water used was withdrawn from Coastal Plain aquifers.

Water use can be categorized by type of user. The following water-use categories are discussed in this report:

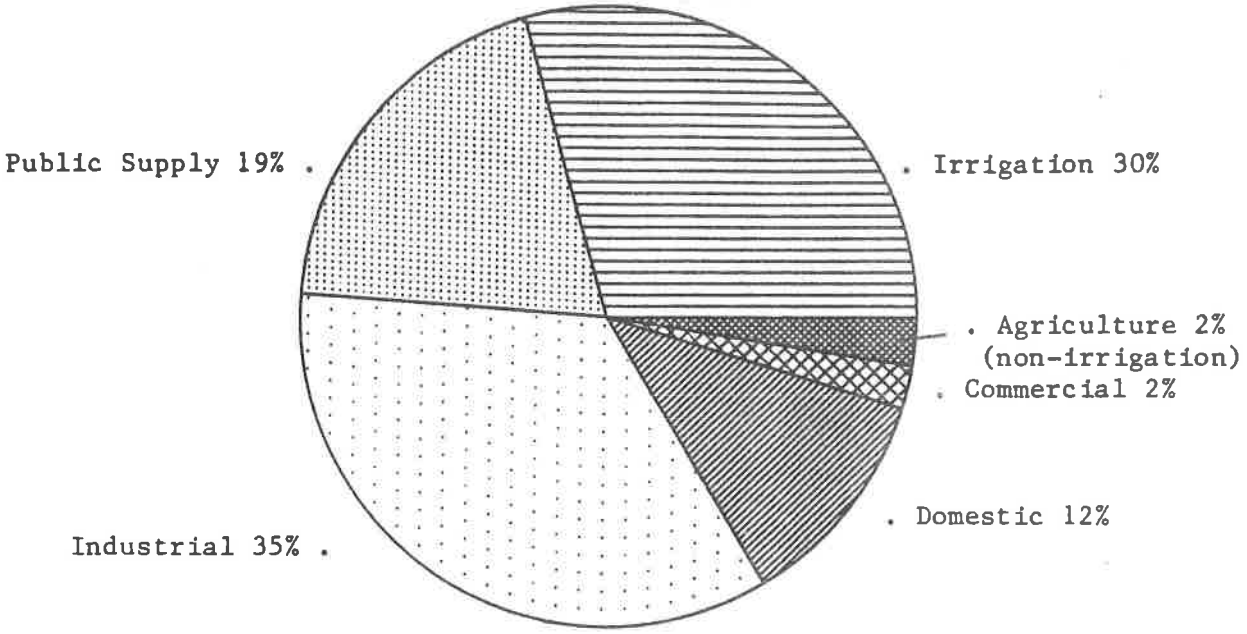
- Public supply
- Self-supplied industrial
- Irrigation
- Self-supplied domestic
- Commercial
- Agriculture (non-irrigation)
- Thermoelectric power generation.

Data for industrial and water supply estimates are collected annually from various EPD offices and stored in the Georgia Water Use Data System. The irrigation water-use estimates in this report are based mainly on the Cooperative Extension Service's 1984 Irrigation Survey. Data for other water-use categories were obtained from EPD files, user surveys, and previous studies by the Georgia Water Use Program (refer to Figure 2-1).

In this report, 1985 information is used when available; if not, earlier data are used. The Georgia Water Use Program presently is working on detailed estimates for 1985 water use, which are to be published in 1987. The 1985 water use information presented in this circular should be considered as preliminary.

Ground Water Use, 1985

Excluding Power Generation



Total Water Use, 1985

Excluding Power Generation

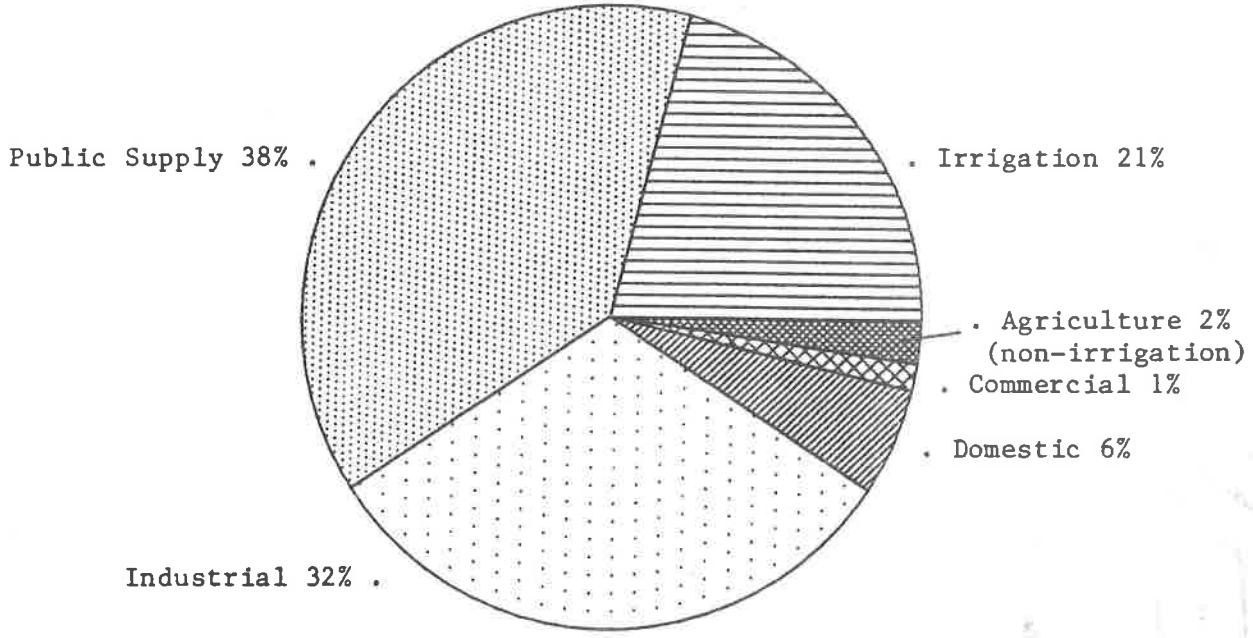


Figure 2-1: Water Use, 1985

PUBLIC SUPPLY GROUND-WATER USE

The public supply water-use category includes water supplied by municipal, county, and private water suppliers. In 1985, total water withdrawn by public suppliers in Georgia was 836 mgd, 25% (205 mgd) of which was ground water. Public supply use in 1983 was 756 mgd with 184 mgd supplied from wells. Two thirds of this water was for domestic purposes; the rest was sold to industries and businesses. In 1983, 95% of the public supply ground-water withdrawals were from Coastal Plain aquifers and 60% of those withdrew from the Floridan aquifer system (formerly called the Principal Artesian aquifer).

Public supply withdrawals increased 8% from 773 mgd in 1980 to 836 mgd in 1985 (refer to Figure 2-2). During the same period, there was a 9.4% increase in population. Most of the increase in public supply water use was by surface water users, especially from major population centers in the Piedmont.

INDUSTRIAL GROUND-WATER USE (SELF-SUPPLIED)

In 1985, 367 mgd of ground water were withdrawn by major industries; this comprised 54% of the total industrial water use. Nearly all of the industrial ground-water withdrawals occurred in the Coastal Plain of Georgia, where ground water is abundant and easily accessible. The major self-supplied industries in Georgia are paper, chemicals, foods, textiles, and mining and mineral production.

In 1985, 58 industrial locations withdrew more than 0.5 mgd of ground water, totalling 297 mgd. These same industries withdrew 334 mgd in 1984. Decrease in industrial use could be due to water conservation efforts, such as water reuse, and to declines in the amounts of goods produced.

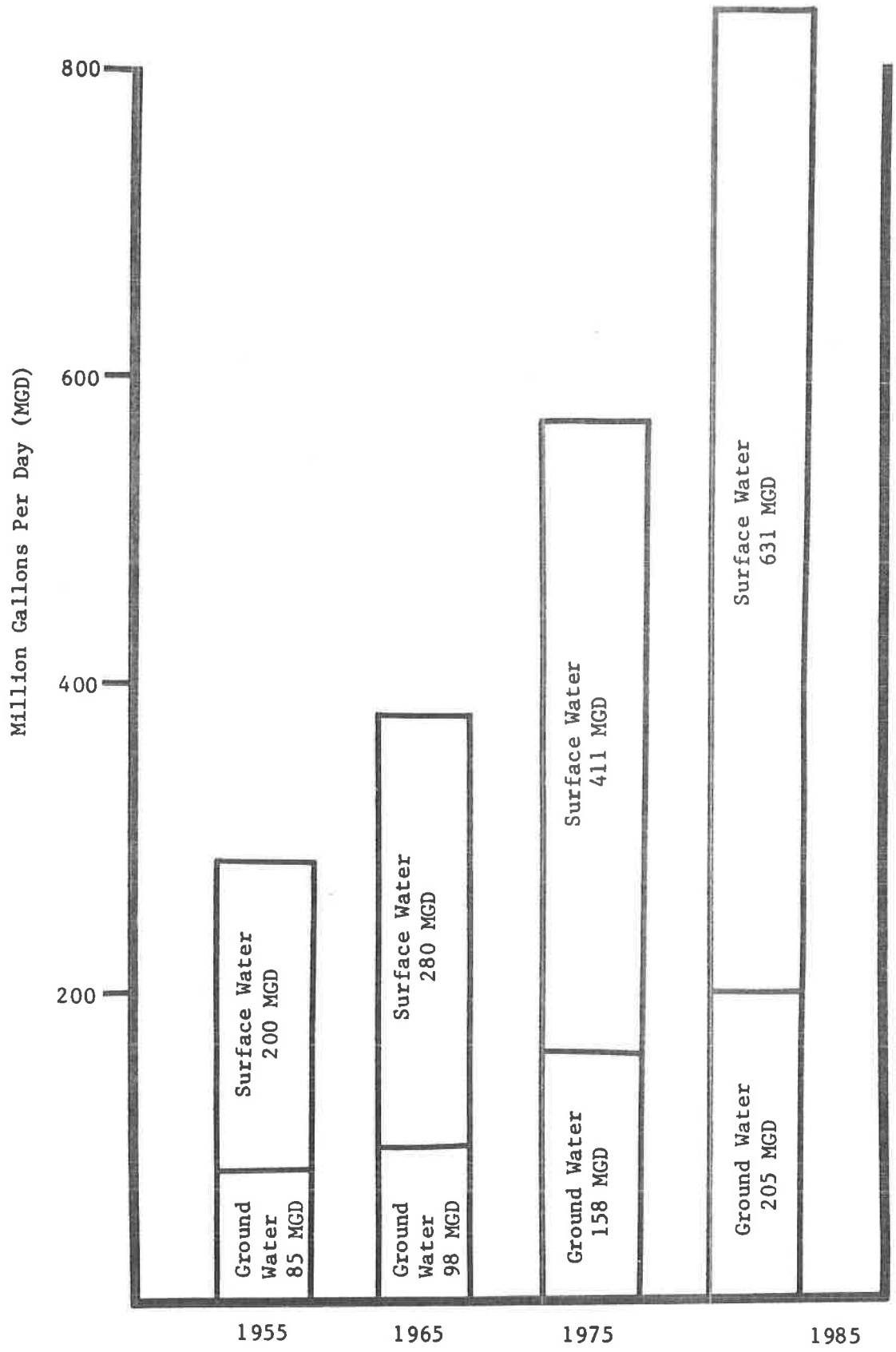


Figure 2-2: Public Supply Water Use, 1955-1985

GROUND-WATER USE FOR IRRIGATION

The Cooperative Extension Service periodically estimates the amount of irrigation in Georgia by surveying their county agents. The most recent survey covered 1984 and estimated the total irrigation acreage for the State to be 1.09 million acres, a 9% increase since 1980. Because estimates for irrigation water use are mainly based on this survey, the most recent estimates are for 1984 instead of 1985.

Approximately 463 mgd of water were used for irrigation in 1984; 68% (313 mgd) of that was ground water. Because 1984 was wetter than 1980, the amount of water used for irrigation was less than the 577 mgd used in 1980. In most instances, farmers irrigated less because the benefit of increased crop yield was not worth the high cost of irrigation, especially during a season of adequate rainfall. Irrigation used 30% of all the ground water withdrawn in Georgia.

For irrigation, the proportion of ground-water to surface-water use is increasing as farmers continue to shift from low-capacity systems such as portable pipe and solid set to center pivot systems. In many parts of the Coastal Plain, the higher pumping rates required by the new systems are easier to obtain from wells than from farm ponds. There was a 33% increase in the number of systems supplied by wells between 1980 and 1984. At least 80% of the center pivot systems use ground water for their water source.

Each year, farmers who pump more than 3,000,000 gallons per month are required to report irrigation water use to the Georgia Environmental Protection Division. The Georgia Irrigation Reporting System is the only source of annual site-specific water use data for irrigation systems. Poor compliance with the reporting requirements has produced insufficient data for determining Statewide water-use estimates, so other data sources must also be used. Only 1,157 irrigation systems were reported for 1985 as compared to 4,630 high capacity systems that were inventoried by the Georgia Water Use Program in 1980.

OTHER GROUND-WATER USE

Self-supplied domestic use in Georgia is estimated to be 123 mgd for 1985. Virtually all self-supplied domestic water is supplied from wells, so that amount also equals total ground water used for rural domestic purposes. A 1983 study of residential water use in subdivisions in the Athens, Georgia vicinity determined that average per capita domestic use was 75 gallons per day (gpd). The 1985 domestic use estimate is equal to the number of people not supplied by public water systems multiplied by the 75 gpd coefficient. Domestic water use for 1980 was 104 mgd. The previous estimate for 1980, 139 mgd, was based on 100 gpd average use.

The commercial use category includes hotels, restaurants, hospitals, prisons, military bases, campgrounds, and other users. Most businesses use water supplied by public water systems. Self-supplied commercial use in 1985 was 28 mgd; 86% (24 mgd) of that was ground water. Estimates have not been determined for commercial use prior to 1985.

In 1985, livestock used an estimated 47 mgd of water. Fifty-four percent of that water (25 mgd) was ground water. These estimates were calculated from animal population figures and coefficients for water use by animal type. Total agricultural water use was 68% greater for 1985 than for 1980. The increase was mainly due to increases in catfish farming, which used an estimated 15 mgd of water in 1985.

Thermoelectric power generation is the largest use category for Georgia, but only a very small amount of the water used is ground water. Surface water is used for cooling in Georgia's thermoelectric plants. Ground water is used for boiler make-up water and sanitary supply in some plants, and ground-water use by these plants totalled 4 mgd in 1985. Surface-water withdrawals for the same year were 3,271 mgd.

GEORGIA GROUND-WATER MONITORING NETWORK

For the Ground-Water Monitoring Network, eighty-seven wells and springs were sampled during 1985 (refer to Figure 3-1). These sample stations represented all seven confined aquifer systems of the Coastal Plain as well as the unconfined aquifers of the Piedmont and Valley and Ridge of north Georgia. The four Monitoring Network stations representing the Blue Ridge and thirty-two other Network stations of the Piedmont and Coastal Plain were not sampled due to the late arrival of a portable pump system. Ground water from all monitoring stations sampled in 1985 was tested for parameters included in the Network's standard analysis: five indicator parameters, twelve common agricultural and industrial organics, and thirty additional metals (refer to Table 3-1). Where regional, industrial, or agricultural practices were deemed to have the potential to affect ground-water quality in the vicinity of a monitoring station, additional parameters were tested.

Monitoring stations are located in three critical areas:

(a) recharge areas of the State's major aquifers,
(b) other areas of potential pollution related to regional activities (agricultural and industrial areas), and
(c) areas of heavy pumpage.

The majority of Network sampling stations are municipal and industrial wells that have reliable well completion data. In specific areas where the State's aquifers are susceptible to contamination or pollution (for example, the Dougherty Plain of southwest Georgia and the State's coastal area), monitoring wells maintained jointly by the Georgia Geologic Survey and the U.S. Geological Survey also are used. Because these wells are completed in specific permeable zones of an aquifer, analyses from several of these wells from a particular area can be used to assess the ambient quality of ground water in an aquifer.

Figure 3-1: Location of Ground-Water Monitoring Network Stations, 1985

Parameter		Maximum Contaminant Level (Where Applicable)
pH		--
Spec. Cond.	umho/cm	--
Cl	mg/L	250
SO_4	mg.S/L	250
NO_2+NO_3	mg.N/L	10
Organic Screen #2		
Dicofol	ug/L	--
Endrin	ug/L	0.2
Lindane	ug/L	4
Methoxychlor	ug/L	100
PCB's	ug/L	--
Permethrin	ug/L	--
Toxaphene	ug/L	5
Organic Screen #4		
2,4-D	ug/L	100
Acifluorfen	ug/L	--
Chloramben	ug/L	--
Silvex	ug/L	10
Trichlorfon	ug/L	--
ICP SCREEN		
Ca	mg/L	--
K	mg/L	--
Mg	mg/L	--
Na	mg/L	--

Parameter		Maximum Contaminant Level (Where Applicable)
ICP SCREEN, Cont.		
Ag	ug/L	50
Al	ug/L	--
As	ug/L	50
Au	ug/L	--
Ba	ug/L	1,000
Be	ug/L	--
Bi	ug/L	--
Cd	ug/L	10
Co	ug/L	--
Cr	ug/L	50
Cu	ug/L	1,000
Fe	ug/L	300
Mn	ug/L	50
Mo	ug/L	--
Ni	ug/L	--
Pb	ug/L	50
Sb	ug/L	--
Se	ug/L	10
Sn	ug/L	--
Sr	ug/L	--
Ti	ug/L	--
Tl	ug/L	--
V	ug/L	--
Y	ug/L	--
Zn	ug/L	5,000
Zr	ug/L	--

Table 3-1: Standard Water Quality Analysis of the Ground-Water Monitoring Network - Maximum Contaminant Levels* from the Georgia Rules for Safe Drinking Water

umho/cm = micromhos/centimeter, mg/L = milligrams/liter (parts per million), ug/L = micrograms/liter (parts per billion)

*Maximum Contaminant Levels should not be confused with Maximum Concentration Limits from the Georgia Rules for Hazardous Waste Management.

Sampling procedures are adapted from techniques of the U.S. Geological Survey and the U.S. Environmental Protection Agency. All analyses, except for some contracted organic screens, were performed by EPD laboratories. Data for the Ground-Water Monitoring Network are constantly updated in the U.S. Environmental Protection Agency's STORET computer data system.

CRETACEOUS AQUIFER SYSTEM

The Cretaceous aquifer system is a group of six interconnected aquifers developed in Cretaceous age sands of the Coastal Plain Province (Pollard and Vorhis, 1980). These sands form an extensive western outcrop/recharge area immediately south of the Fall Line. Outcrops are restricted to valley bottoms in the northeastern Coastal Plain. This aquifer system supplies ground water for a 35-mile-wide band paralleling the Fall Line. The aquifer sands thicken southward from the Fall Line, where they crop out against crystalline Piedmont rocks, to a sequence of sand and clay approximately 2,000 feet thick at the limit of the aquifer use area, twenty miles south of the aquifer outcrop.

For the Ground-Water Monitoring Network, ground-water samples were collected from eleven wells, completed in the Cretaceous aquifer system, during 1985. Three of the wells were sampled twice. Except for the Laurens County well, all monitoring wells were located in the outcrop area of the aquifer system.

Ground water of the Cretaceous aquifer system was characteristically acidic and soft. Typical pH values ranged between 4.1 and 6.9. However, the two deepest wells, adjacent to the Chattahoochee River, yielded water with basic pH values: 8.9 and 9.2. Calcium and magnesium concentrations of ground water from the outcrop area were less than three parts per million (ppm). Sodium and potassium concentrations also were generally less than three ppm. Sodium levels were higher in water from the two deepest wells, at 48 and 81

ppm. Figure 3-2 illustrates the concentrations, in the water from each sample station, of the common alkali cations: calcium plus magnesium (the major controls of water hardness), and sodium plus potassium.

Iron concentrations exceeded the State's maximum contaminant level (MCL)* in ground water from only one well (Laurens County). Manganese concentrations were below the MCL in all ground-water samples. Copper and zinc, in low concentrations, were other common metal cations. Figure 3-3 presents the occurrence of the metallic cations: iron and manganese as well as copper, lead, and zinc.

Low chloride, sulfate, and nitrate/nitrite concentrations in all wells indicated general ground-water quality was excellent. A small increase in chloride values (less than two ppm) occurred from 1984 to 1985 in the three wells of south Bibb and Houston Counties. However, these concentrations are near the lower detection limits of the laboratory instruments and probably are not significant.

Analyses of several ground-water samples, representing water quality of the Cretaceous aquifer system, suggested the presence of possible pollutants. Further investigations of each occurrence, however, indicated that pollutants are not present in the aquifer. Chloroform was detected in samples of water collected in 1984 from a well supplying process water to the Packaging Corporation of America, Bibb County. Analyses of water samples collected in 1985, from a spigot closer to the well, revealed the source of the chloroform was the plant's piping system. Lead, in concentrations exceeding the MCL, was detected in the first samples of water collected for the Ground-Water Monitoring Network from Buena Vista Well #3, Marion County. Follow-up samples did not contain measurable concentrations of lead. The source of the lead apparently was an

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*State maximum contaminant levels (MCL's) are only intended to be applied to drinking water, which is typically treated prior to use. MCL's are used in this report as a measure by which to evaluate raw water quality (Refer to Table 3-1).

Figure 3-2: Water Quality of the Cretaceous Aquifer System: Alkali Cations Calcium + Magnesium (ppm) / Sodium + Potassium (ppm)

Figure 3-3: Water Quality of the Cretaceous Aquifer System: Metallic Cations Iron + Manganese (ppb)* / Copper + Lead + Zinc (ppb) (The minimum detection limit of Iron + Manganese = 20ppb. The minimum detection limit of Copper + Lead + Zinc = 45ppb.)

* ppb = parts per billion

old water tap that had been replaced after the first samples were collected. Dicofol, a common pesticide, was detected in ground-water samples collected in 1985 from the two Richmond County wells. Later samples from the two wells did not confirm the presence of the pollutant. It is likely that the pollutant was introduced into the first samples through some failure in the sample/transport/analyses procedures.

JACKSONIAN AQUIFER SYSTEM

The Jacksonian aquifer system is developed in Eocene age sands of the Barnwell Group (Vincent, 1982). Sands and clays of the Barnwell Group crop out over a large area in the northeast corner of the Coastal Plain Province. Water-bearing sands of the Jacksonian aquifer system are relatively thin, ranging from ten to fifty feet thick. Because the aquifer sands grade into finer grained silts and clays to the south, aquifer use is generally restricted to the outcrop area and areas less than ten miles to the south.

Water quality was monitored in six wells of the Jacksonian aquifer system during 1985 for the Ground-Water Monitoring Network. Two of these wells were located in the aquifer outcrop area.

The Jacksonian aquifer system yields water that is generally basic and soft. Only one well, in Jefferson County, produced acidic water, with a pH value of 6.6. Other pH values ranged between 7.5 and 7.8. Calcium and magnesium concentrations averaged 49 ppm. Sodium and potassium concentrations were less than 12 ppm in all wells (refer to Figure 3-4).

Iron concentrations in the ground water were below the MCL in all wells. Manganese values were typically low, however, concentrations in the Emanuel County well were measured at 125 ppb. Zinc, in very low concentrations, was the only other metal cation detected (refer to Figure 3-5).

Chloride, sulfate, and nitrate/nitrite concentrations were typically low.

Figure 3-4: Water Quality of the Jacksonian Aquifer System: Alkali Cations Calcium + Magnesium (ppm) / Sodium + Potassium (ppm)

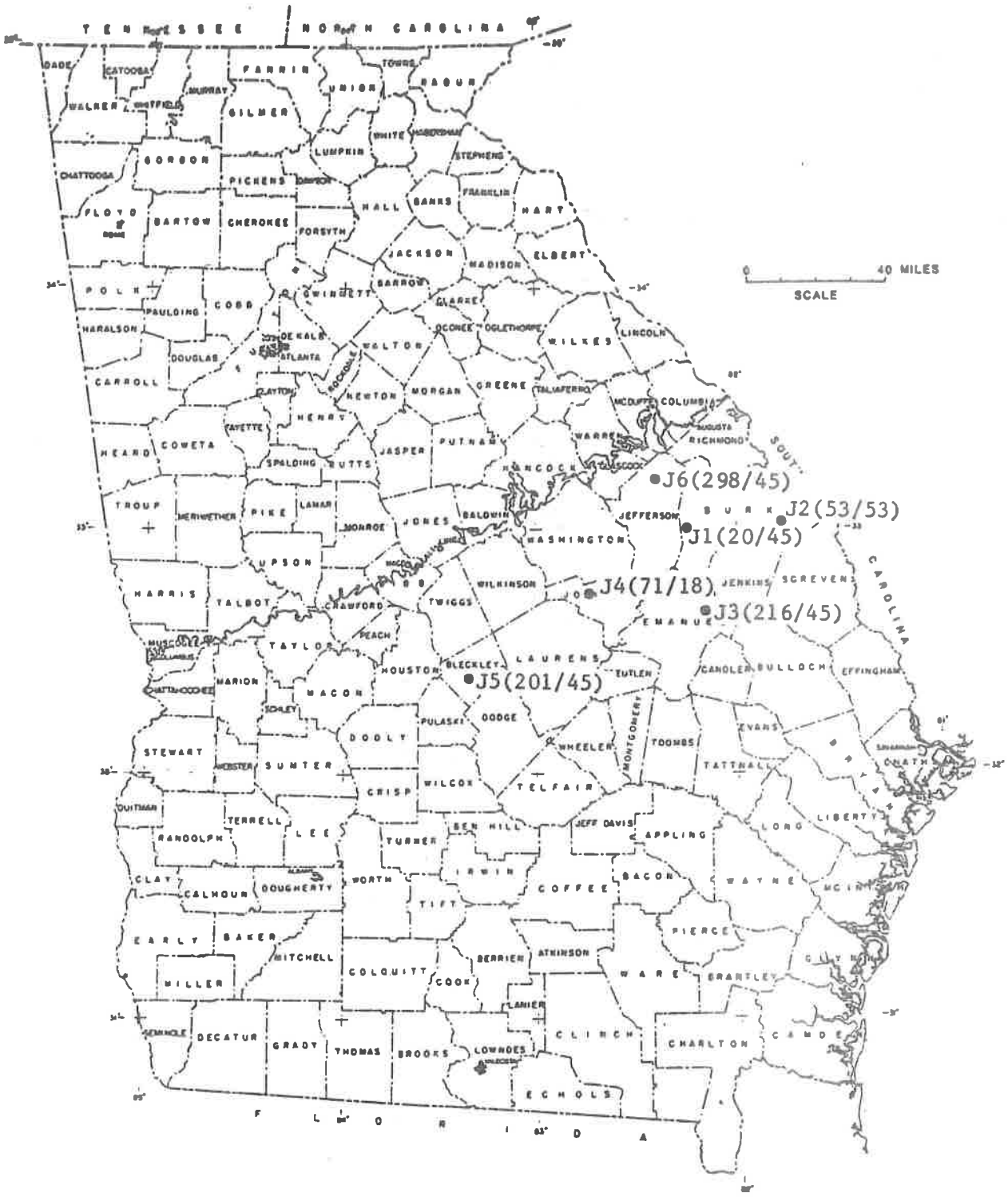

Figure 3-5: Water Quality of the Jacksonian Aquifer System: Metallic Cations
Iron + Manganese (ppb) / Copper + Lead + Zinc (ppb)

However, increases in the chloride and nitrate/nitrite concentrations in ground water between 1984 and 1985 around Vidette, in west Burke County, were noted.

FLORIDAN AQUIFER SYSTEM

The Floridan aquifer system, formerly known as the Principal Artesian aquifer system, is primarily developed in Eocene and Oligocene age limestones that underlie most of the Coastal Plain Province (Crews and Huddlestun, 1984). These limestones crop out in a large karst area of southwest Georgia included in the Dougherty Plain and along strike to the northeast. In the west, significant recharge to the aquifer system occurs in the Dougherty Plain. Recharge in the east is derived primarily from leakage from the Jacksonian aquifer system. The Floridan aquifer system is a major source of ground water for much of the aquifer outcrop area and throughout the down-dip area to the south and east. From the up-dip limit, defined in the east by clays of the Barnwell Group, the aquifer thickens to over 700 feet in coastal Georgia.

For the Ground-Water Monitoring Network, 62 ground-water samples were collected from 43 wells during 1985. These wells were located in the outcrop area and throughout the down-dip confined area.

Ground water of the Floridan aquifer system was characteristically basic. Values for pH ranged from 7.0 to 8.1. Water samples were soft to moderately soft. Calcium and magnesium concentrations were highest along the coast, up to 120 ppm. Sodium and potassium were distributed similarly. Concentrations were generally less than 10 ppm near the outcrop area, but increased to as much as 124 ppm in coastal Georgia (refer to Figure 3-6).

Iron concentrations in the ground-water samples were usually below 100 ppb. Iron values exceeded the MCL in only one well, Tifton Well #6 in Tift County, at 410 ppb. Manganese concentrations were characteristically below

detection limits. Zinc, in minor concentrations, was the only other common metal cation (refer to Figure 3-7).

Chloride and sulfate levels were highest along the coast. Sulfate concentrations also were higher, up to 65ppm, in a broad area associated with a local recharge zone in northwest Lowndes County. Chloride values exceeded the MCL in ground-water samples from two monitoring wells maintained near Brunswick, Glynn County. Sulfate concentrations were far below the MCL in all samples. Nitrate/nitrite values were generally very low. However, higher nitrate/nitrite concentrations were detected in samples from a group of nine wells located in the Dougherty Plain and in one of two ground-water samples from Valdosta Well #1, Lowndes County, and from St. Marys Well #2, Camden County. All nitrate/nitrite concentrations were within drinking water standards.

Three volatile organics: 1,1-dichloroethylene, trichloroethylene, and tetrachloroethylene, were detected in ground water from a monitoring well in Albany, Dougherty County. Further samples from the well, collected during 1986, verified the occurrence of the pollutants. An investigation of this occurrence by the Land Protection Branch of EPD is in progress.

PROVIDENCE, CLAYTON, AND CLAIBORNE AQUIFER SYSTEMS

A large area of southwest Georgia is dependent upon three vertically stacked aquifers of late Cretaceous through middle Eocene age: the Providence (sands), Clayton (limestones), and Claiborne (sands) aquifers (Clarke, et al, 1983; and McFadden and Perriello, 1983). These aquifers crop out in irregular patterns defined primarily by topography. Both the limited size and steep slopes of the outcrop areas restrict recharge to the aquifers. Near the southern limit of the aquifer use area, wells can be developed in the aquifer systems up to 1,200 feet deep.

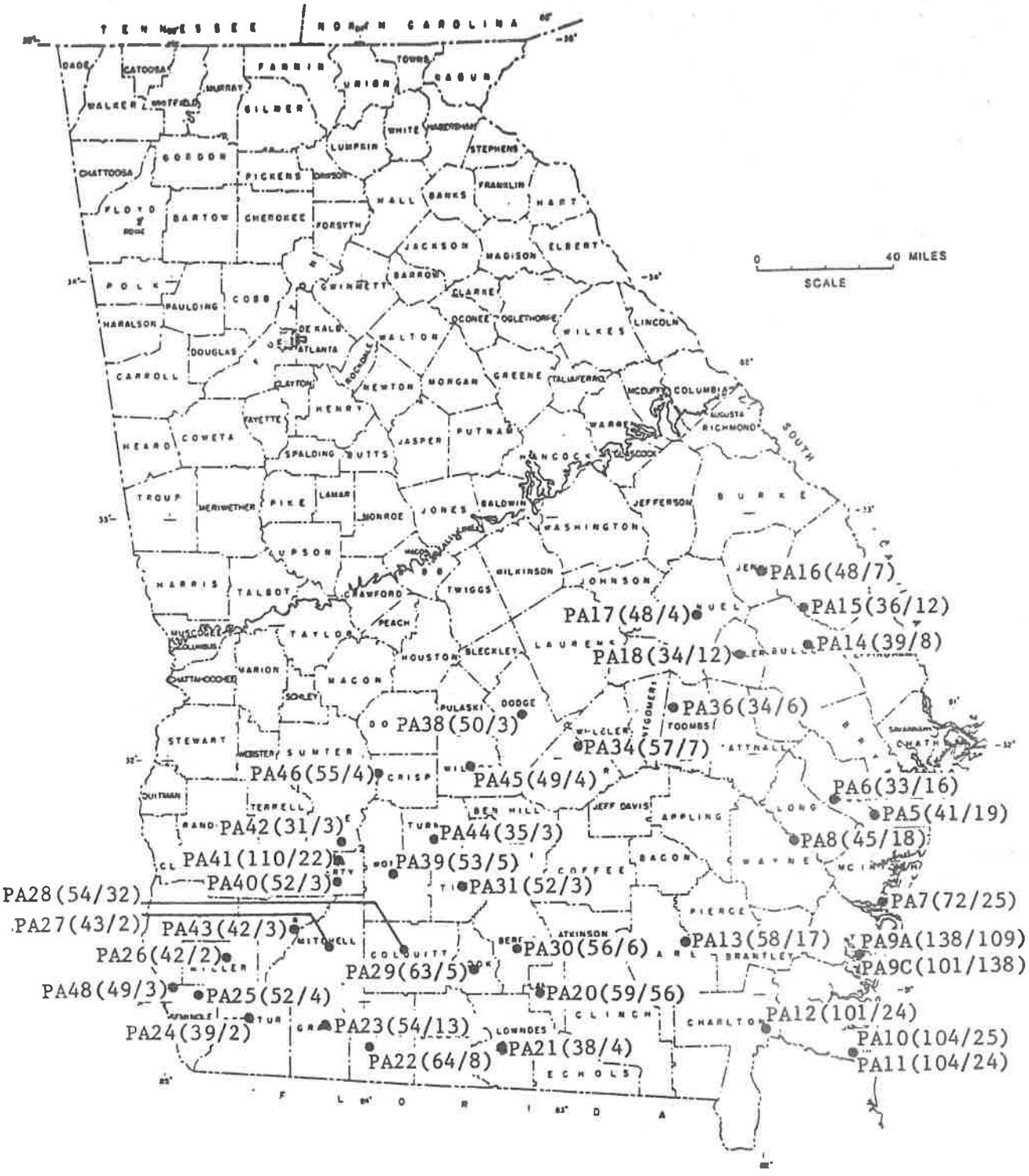

Figure 3-6: Water Quality of the Floridan Aquifer System: Alkali Cations Calcium + Magnesium (ppm) / Sodium + Potassium (ppm)

Figure 3-7: Water Quality of the Floridan Aquifer System: Metallic Cations
Iron + Manganese (ppb) / Copper + Lead + Zinc (ppb)

During 1985, ground-water quality was monitored in four Providence aquifer system wells, one Clayton aquifer system well, and two Claiborne aquifer system wells. These wells represented ground-water quality in both aquifer outcrop areas and down-dip confined areas.

All wells produced soft water. Calcium and magnesium concentrations were below 50 ppm. However, among the three aquifer systems, pH values varied widely, from 4.7 to 9.0. Sodium and potassium concentrations were low, less than 10 ppm, in the two up-dip Providence wells and the Clayton and Claiborne wells. Sodium concentrations were higher, 78 and 85 ppm, in the two down-dip Providence wells (refer to Figure 3-8).

Except for the Providence system monitoring well in Dougherty County, iron concentrations in the ground waters were below the MCL. Only one well, Plains Well #3, in west Sumter County, yielded water with an elevated manganese level. Copper and zinc, in very low concentrations, were the only other metal cations detected (refer to Figure 3-9). Generally low chloride, sulfate, and nitrate/nitrite concentrations indicate water quality has not been degraded.

MIOCENE AQUIFER SYSTEM

The Miocene age Screven Formation and Hawthorne Group crop out over a broad area of the central and eastern Coastal Plain Province. Permeable sands and limestones within the Miocene section form the Miocene aquifer system (Crews, 1984). The Miocene aquifer system is used as a source of ground water throughout most of the outcrop area and in down-dip confined areas to the south and the east. Individual water-bearing units are often thin, usually less than fifty feet thick.

Three wells completed in the Miocene aquifer system were sampled for the Ground-Water Monitoring Network during 1985. Five ground-water samples were collected. The two wells in Cook and Lowndes Counties were located in the

Figure 3-8: Water Quality of the Providence, Clayton, and Claiborne Aquifer Systems: Alkali Cations
Calcium + Magnesium (ppm) / Sodium + Potassium (ppm)

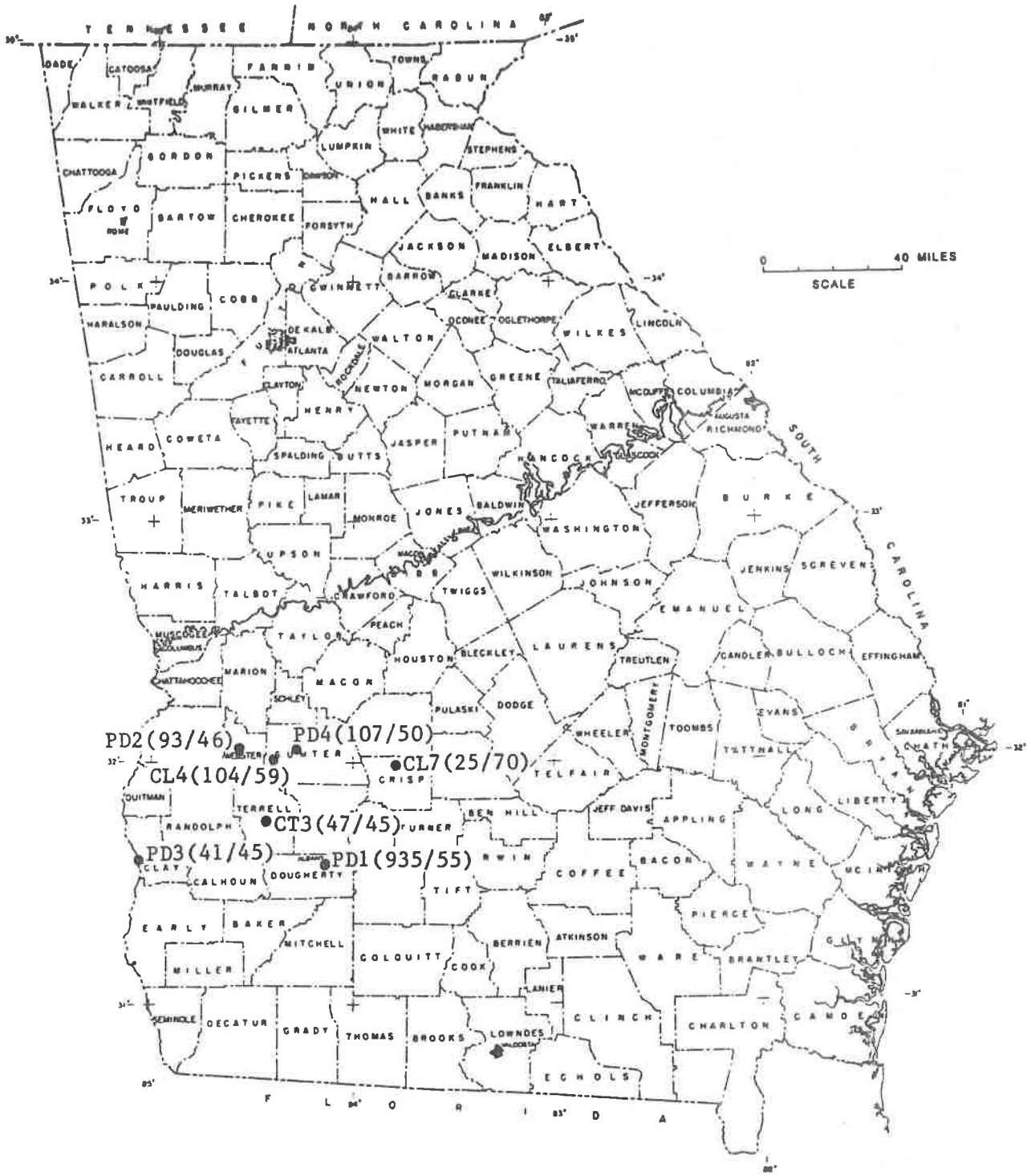

Figure 3-9: Water Quality of the Providence, Clayton, and Claiborne Aquifer Systems: Metallic Cations
Iron + Manganese (ppb) / Copper + Lead + Zinc (ppb)

aquifer recharge area. One well, in Glynn County, was located in a down-dip confined area.

The quality of the ground-water samples of the Miocene aquifer system varied widely. The Lowndes County well yielded water with an acidic pH of 5.0. Samples from the wells in Cook and Glynn Counties were basic. Values for pH ranged from 7.8 to 8.0. Ground-water from the down-gradient Glynn County well was relatively mineralized; calcium, sodium, potassium, iron, chloride, and sulfate concentrations were higher. Manganese levels were very low in all wells. Zinc and copper, in low concentrations, were present in some of the samples (refer to Figures 3-10 and 3-11). Low levels of nitrate/nitrite, chloride, and sulfate in the two wells of the aquifer outcrop area indicate the recharging ground-water is of good quality.

PIEDMONT UNCONFINED AQUIFERS

Georgia's Piedmont is underlain by metamorphic and igneous rocks that are predominately Paleozoic in age. The soil/saprolite horizons and rock fractures are the major water bearing features. Both high angle and near horizontal fractures have been shown to be important to water yield in wells of the Piedmont (Cressler, et al, 1983).

During 1985, ground water was sampled from nine wells for the Monitoring Network. Of these wells, seven were high-yield municipal and industrial wells. A domestic well and water-level monitoring well also were sampled in the Atlanta area. All wells included in the Network were completed in fractured crystalline rock.

Samples of water from the seven high-yield wells were acidic. Values for pH ranged from 5.3 to 6.8. The other two wells produced water with pH values of 7.0 and 7.4. Calcium and magnesium concentrations averaged 15 ppm. Sodium and potassium levels averaged 12 ppm (refer to Figure 3-12).

Figure 3-10: Water Quality of the Miocene Aquifer System: Alkali Cations
Calcium + Magnesium (ppm) / Sodium + Potassium (ppm)

Figure 3-11: Water Quality of the Miocene Aquifer System: Metallic Cations
Iron + Manganese (ppb) / Copper + Lead + Zinc (ppb)

Iron and manganese levels exceeded the MCL's in ground-water samples from five of the wells. Zinc, in low concentrations, was the only other common metal cation (refer to Figure 3-13). Generally low chloride, sulfate, and nitrate/nitrite concentrations in all wells indicated ground-water quality has not significantly degraded in the Piedmont.

Two volatile organics, chloroform and dichlorobromomethane, were detected in the Riverdale Delta Drive Well, Clayton County. These compounds are common chlorination byproducts. Follow-up samples, carefully collected to eliminate chlorination, contained no detectable concentrations of any volatile organics.

VALLEY AND RIDGE UNCONFINED AQUIFERS

Low yield unconfined aquifers are developed in soils and saprolite across most of the Valley and Ridge Province. However, wells and springs used for municipal supplies generally are restricted to the outcrop areas of dolostones and limestones exposed in valley bottoms. In the province, most ground water used for municipal supplies is derived from dolostones and limestones of the Cambro-Ordovician age Knox Group and the Ordovician age Chickamauga Group.

For the Ground-Water Monitoring Network, eleven samples from six wells and three springs were collected for analysis during 1985. Four of the wells and all three springs produced water from the Knox and Chickamauga carbonates.

Excluding the two wells of the Missionary Ridge area south of Chattanooga, ground-water quality across the Valley and Ridge Province was uniform. The ground waters were basic and generally soft. Values for pH ranged from 7.3 to 7.9. Calcium and magnesium concentrations averaged 43 ppm. Sodium and potassium levels were less than 10 ppm (refer to Figure 3-14). Iron, in very low concentrations, was the only common metal cation detected (refer to Figure 3-15). Chloride and sulfate levels were generally near or below the lower

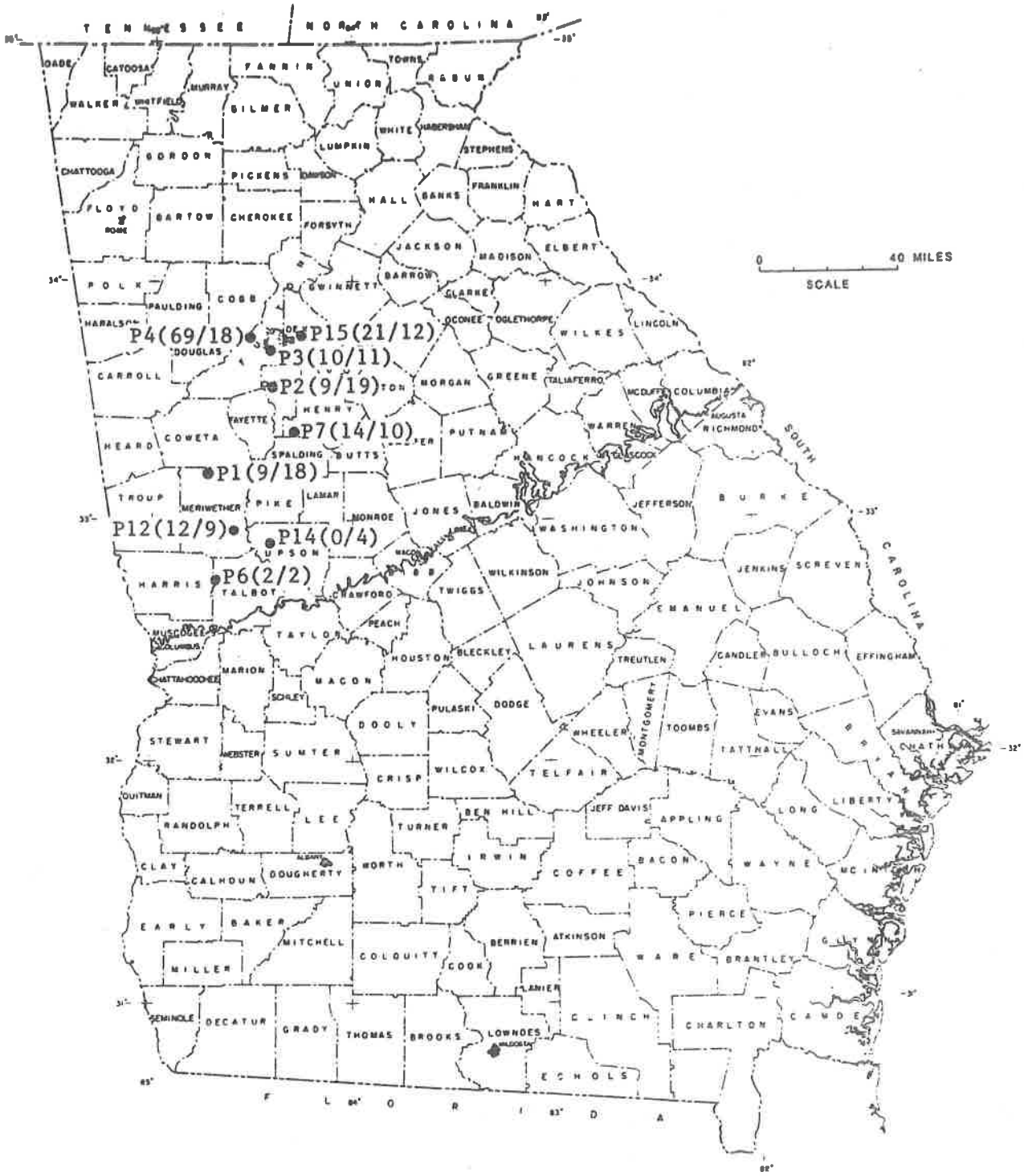

Figure 3-12: Water Quality of the Piedmont Unconfined Aquifers: Alkali Cations Calcium + Magnesium (ppm) / Sodium + Potassium (ppm)

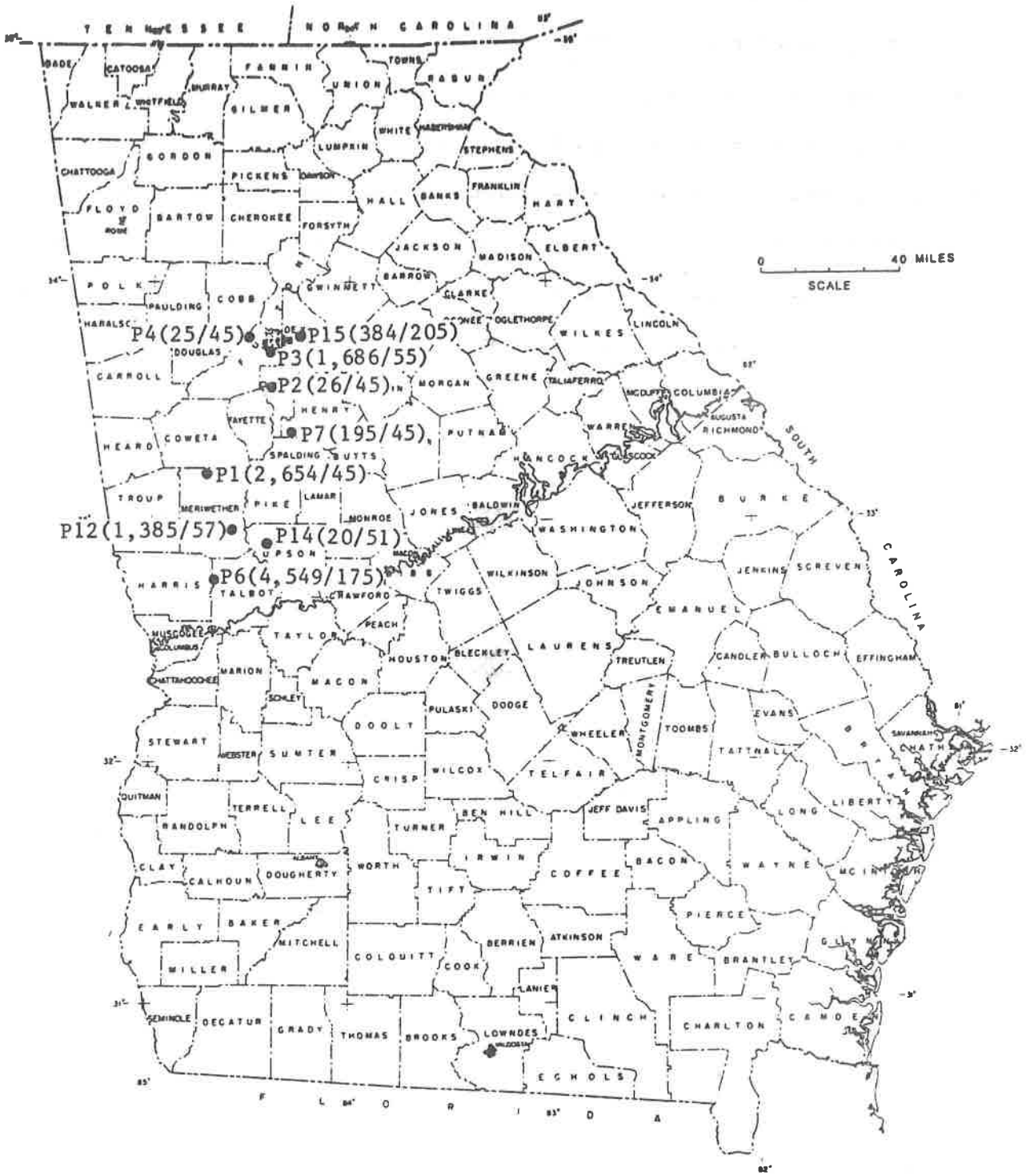

Figure 3-13: Water Quality of the Piedmont Unconfined Aquifers: Metallic Cations Iron + Manganese (ppb) / Copper + Lead + Zinc (ppb)

limits of detection.

Ground-water samples from the two wells of the Missionary Ridge area were mineralized. Calcium, magnesium, sodium, potassium, iron, manganese, chloride, and sulfate concentrations were higher. Water from the well in Fort Oglethorpe, Catoosa County, contained levels of manganese that exceeded the MCL.

Nitrate/nitrite concentrations exceeded 0.45 ppm in samples from seven of the monitoring stations. Although these samples suggest wide-spread occurrence, all nitrate/nitrite values are far below the MCL.

Figure 3-14: Water Quality of the Valley and Ridge Unconfined Aquifers:
Alkali Cations
Calcium + Magnesium (ppm) / Sodium + Potassium (ppm)

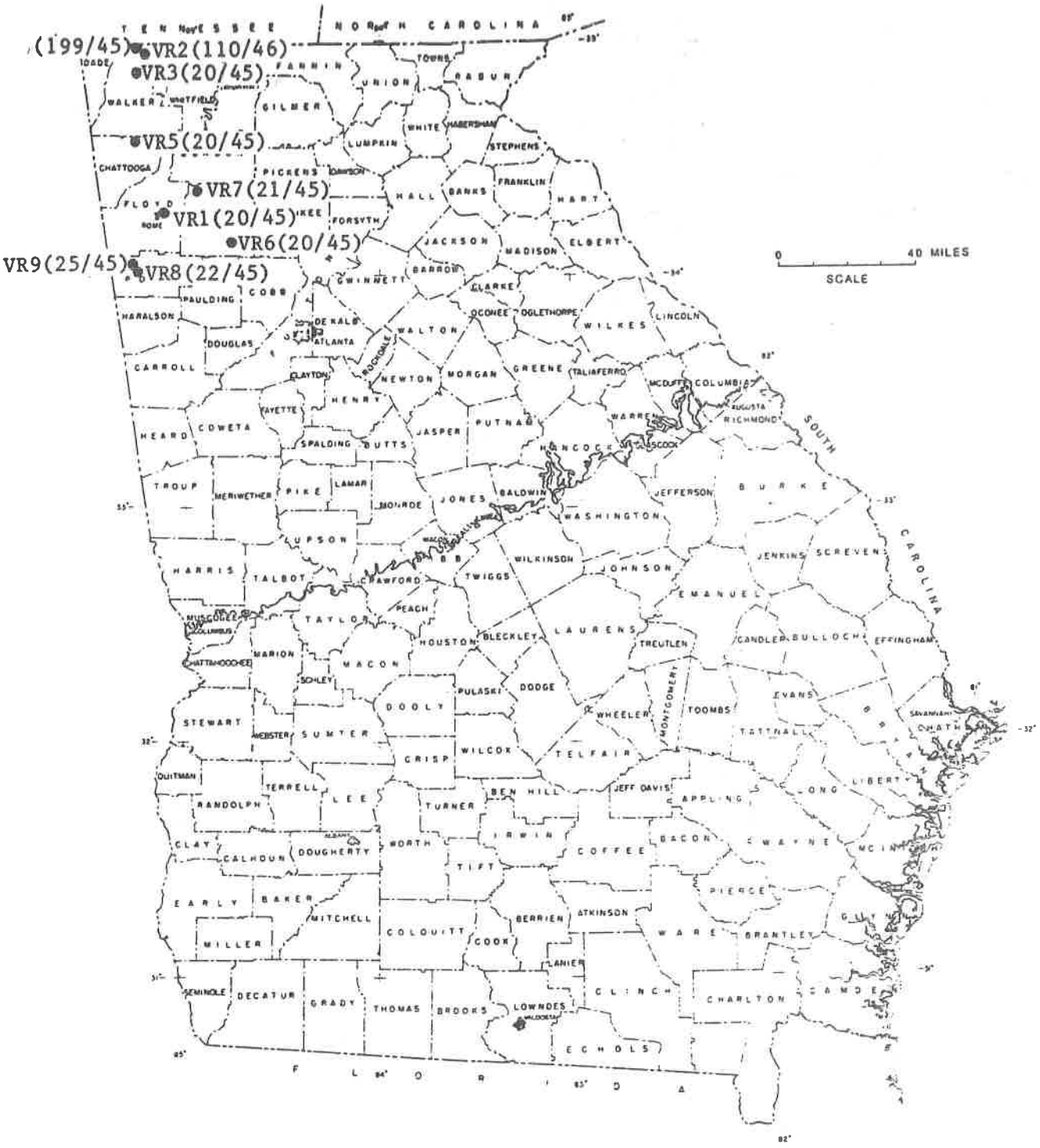

Figure 3-15: Water Quality of the Valley and Ridge Unconfined Aquifers:
Metallic Cations
Iron + Manganese (ppb) / Copper + Lead + Zinc (ppb)

SUMMARY

General ground-water quality remained excellent across the State during 1985. The only common contaminants that exceeded MCL's were iron and manganese (in ground water from only 17 of 87 monitoring stations). Ground-water use remained highest in the Coastal Plain. The Floridan aquifer system provided the majority of water used in the Coastal Plain.

Higher nitrate/nitrite levels, none more than one half of the MCL, are common in ground water from two regions of the State, the Dougherty Plain of the southwest Coastal Plain and the carbonate outcrops of the Valley and Ridge (refer to Figure 4-1). Both regions include large areas of karst topography. Rapid recharge rates and very high ground-water flow rates, characteristic of karst settings, make these areas vulnerable to ground-water contamination and/or pollution. Although the nitrate/nitrite concentrations monitored during 1985 are low in these areas, special management practices may be warranted to prevent further ground-water quality degradation.

Only one occurrence of organics pollution was detected by the Ground-Water Monitoring Network. A monitoring well in Albany (Dougherty Plain) contained traces of three volatile organics in the shallowest aquifer. Analyses of follow-up samples, collected in 1986, confirmed the occurrence. EPD's monitoring of nearby municipal wells, completed in deeper aquifers, did not indicate the presence of volatile organics.

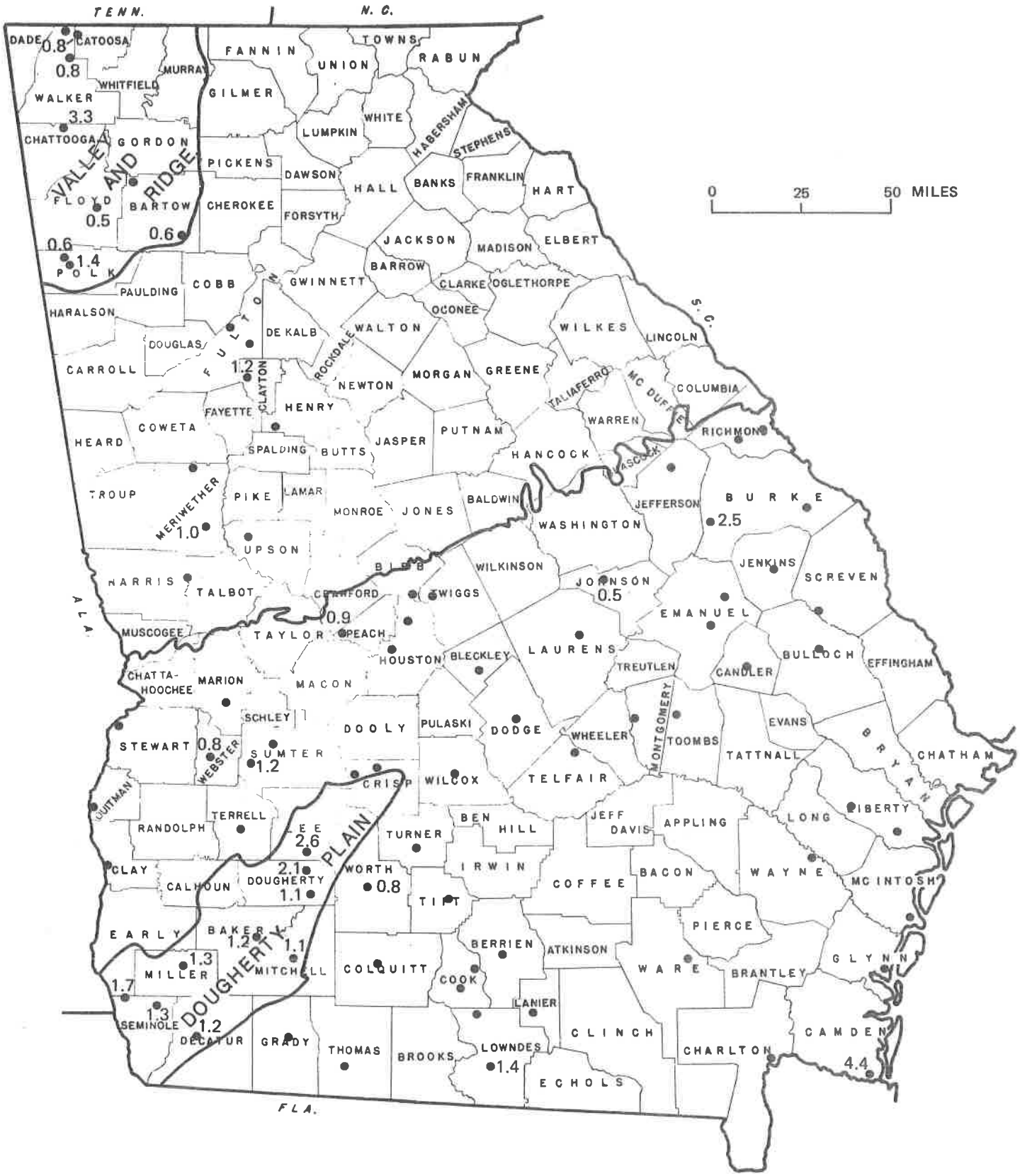

Figure 4-1: Maximum Nitrate/Nitrite Concentrations Detected by the Ground-Water Monitoring Network, 1985 (Nitrate/Nitrite > 0.45ppm)

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APPENDIX: ANALYSES OF SAMPLES COLLECTED DURING 1985 FOR THE GEORGIA GROUND-WATER MONITORING NETWORK

All water quality samples that are collected for the Georgia Ground-Water Monitoring Network are subjected to a Standard Analysis which includes tests for five 'indicator' parameters, twelve common agricultural and industrial chemicals, and thirty metals. Analyses for additional parameters may be included for samples that are collected from an area where a possibility of ground-water pollution exists due to regional activities. These optional screens include tests for agricultural chemicals, coal tar creosote, phenols and anilines, and volatile organic compounds (refer to Tables A-1 through A-4). Because parameters other than the five 'indicators' and thirty metals of the Standard Analysis were detected very rarely, the analyses of the appendix contain reference only to those other parameters where they were detected.

For this appendix, the following abbreviations are used:

su = standard units,

mg/L = milligrams per liter (parts per million),

ug/L = micrograms per liter (parts per billion), and

umho/cm = micromhos per centimeter.

Parameter	Detection Limit	
pH	---	su
Spec. Cond.	1.0	umho/cm
Chloride	0.1	mg/L
Sulfate	2.0	mg/L
NO_2+NO_3	0.02	mg/L
ORGANIC SCREEN #2		
Dicofol	0.10	ug/L
Endrin	0.03	ug/L
Lindane	0.008	ug/L
Methoxyclor	0.30	ug/L
PCB's	0.60	ug/L
Permethrin	0.30	ug/L
Toxaphene	1.20	ug/L
ORGANIC SCREEN #4		
2,4-D	5.2	ug/L
Acifluorfen	1.0	ug/L
Chloramben	0.2	ug/L
Silvex	0.1	ug/L
Trichlorfon	2.0	ug/L
ICP METAL SCREEN		
Calcium	0.0	mg/L
Magnesium	0.0	mg/L
Sodium	0.0	mg/L
Potassium	0.5	mg/L

Parameter	Detection Limit	
ICP METAL SCREEN, Cont.		
Silver	10	ug/L
Aluminum	50	ug/L
Arsenic	50	ug/L
Gold	25	ug/L
Barium	10	ug/L
Beryllium	10	ug/L
Bismuth	50	ug/L
Cadmium	10	ug/L
Cobalt	10	ug/L
Chromium	10	ug/L
Copper	10	ug/L
Iron	10	ug/L
Manganese	10	ug/L
Molybdenum	10	ug/L
Nickel	25	ug/L
Lead	25	ug/L
Antimony	50	ug/L
Selenium	3	ug/L
Tin	50	ug/L
Strontium	10	ug/L
Titanium	10	ug/L
Thallium	50	ug/L
Vanadium	10	ug/L
Yttrium	10	ug/L
Zinc	10	ug/L
Zirconium	10	ug/L

Table A-1: Standard Water Quality Analysis: Indicator Parameters, Organic Screens #2 and #4, and ICP Metal Screen

Parameter	Detection Limit		Parameter	Detection Limit	
Cyanide	0.05	ug/L	Mercury	0.5	ug/L
		ORGANIC SCREEN #1			
Alachlor	3.00	ug/L	Malathion	1.40	ug/L
Atrazine	0.44	ug/L	Metolachlor	2.40	ug/L
Azodrin	1.00	ug/L	Metribuzin	1.25	ug/L
Chloropyrifos	0.80	ug/L	Mevinphos	1.40	ug/L
Cynazine	1.00	ug/L	Napropamide	0.81	ug/L
Dasanit	0.60	ug/L	Parathion (E)	0.08	ug/L
DCPA	0.01	ug/L	Parathion (M)	0.10	ug/L
Demeton	1.00	ug/L	Pebulate	1.81	ug/L
Diazinon	1.00	ug/L	Pendimethalin	1.80	ug/L
Dimethoate	0.50	ug/L	Phorate	1.00	ug/L
Disyton	1.00	ug/L	Profluralin	2.00	ug/L
Eptam	1.70	ug/L	Simazine	1.25	ug/L
Ethoprop	0.50	ug/L	Sutan	1.25	ug/L
Fluchloralin	15.0	ug/L	Terbufos	3.00	ug/L
Fonophos	0.50	ug/L	Trifluralin	2.00	ug/L
Guthion	2.00	ug/L	Vernam	0.56	ug/L
Isopropalin	2.00	ug/L			
		ORGANIC SCREEN #3			
Dinoseb	0.10	ug/L			
		ORGANIC SCREEN #5			
Carbaryl	10.0	ug/L	Linuron	0.06	ug/L
Carbofuran	2.0	ug/L	Methomyl	0.03	ug/L
Diuron	0.03	ug/L	Monuron	0.04	ug/L
Fluometuron	0.08	ug/L	Temik	0.20	ug/L
		ORGANIC SCREEN #7			
EDB	1	ug/L			

Table A-2: Additional Water Quality Analyses:
Cyanide, Mercury, and Organic Screens 1, 3, 5, and 7

ORGANIC SCREEN #8

Parameter	Detection Limit
Napthalene	10 ug/L
2-Chloronaphthalene	10 ug/L
Acenaphthylene	10 ug/L
Acenaphthene	10 ug/L
Fluorene	10 ug/L
Phenanthrene	10 ug/L
Anthracene	10 ug/L
Fluoranthene	10 ug/L
Pyrene	10 ug/L
Benzo(a)anthracene	100 ug/L
Benzo(b)fluoranthene	100 ug/L
Benzo(k)fluoranthene	100 ug/L
Benzo(a)pyrene	100 ug/L
Indeno(1,2,3-cd)pyrene	100 ug/L
Benzo(ghi)perylene	100 ug/L

ORGANIC SCREEN #9

Parameter	Detection Limit
Anilene	10 ug/L
2-Chlorophenol	10 ug/L
2-Nitrophenol	10 ug/L
Phenol	10 ug/L
2,4-Dimethylphenol	10 ug/L
2,3-Dichlorophenol	10 ug/L
2,4,6-Trichlorophenol	10 ug/L
Parachlorometa cresol	10 ug/L
2,4-Dinitrophenol	100 ug/L
4,6-Dinitro-o-cresol	50 ug/L
Pentachlorophenol	25 ug/L
4-Nitrophenol	25 ug/L

Table A-3: Additional Water Quality Analyses: Organic Screens 8 and 9

ORGANIC SCREEN #10

Parameter	Detection Limit
Methyl chloride	1 ug/L
Trichlorofluoromethane	1 ug/L
1,1-Dichloroethylene	1 ug/L
1,1-Dichloroethane	1 ug/L
1,2-Trans-dichloroethylene	1 ug/L
Chloroform	1 ug/L
1,2-Dichloroethane	1 ug/L
1,1,1-Trichloroethane	1 ug/L
Carbon tetrachloride	1 ug/L
Dichlorobromomethane	1 ug/L
1,2-Dichloropropane	1 ug/L
Trans-1,3-dichloropropene	1 ug/L
Trichloroethylene	1 ug/L
Benzene	1 ug/L
Chlorodibromomethane	1 ug/L
1,1,2-Trichloroethane	1 ug/L
Cis-1,3-dichloropropene	1 ug/L
Bromoform	1 ug/L
1,2,2,2-Tetrachloroethane	1 ug/L
Tetrachloroethylene	1 ug/L
Toluene	1 ug/L
Chlorobenzene	1 ug/L
Ethylbenzene	1 ug/L
Acetone	50 ug/L
Methyl ethyl ketone	25 ug/L
Carbon disulfide	1 ug/L
Vinyl chloride	1 ug/L
Isopropyl acetate	1 ug/L
2-Hexanone	1 ug/L
Methyl isobutyl ketone	1 ug/L
Styrene	1 ug/L
Xylene	1 ug/L

Table A-4: Additional Water Quality Analyses: Organic Screen 10

Water Quality Analyses for the Cretaceous Aquifer System

STANDARD WATER QUALITY ANALYSES

PARAMETERS	pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL DATE ID # / UNITS	su	umho/cm	mg/L	mg S/L	mg N/L		mg/L						ug/L			
LOCATION / DETECT. LIMITS		1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-K5 7/18/85 Richmond Co. Water Plant #2, Well 101	5.0	14	1.0	--	0.29	0.45	0.22	1.1	--	--	--	--	--	--	--	--
Dicofol was detected at a concentration of 0.51 ug/L.																
GWN-K5 10/21/85 Richmond Co. Water Plant #2, Well 103	4.9	12	1.0	--	0.29	0.30	0.20	1.1	--	--	--	--	--	--	--	--
Dicofol was not detected																
GWN-K6 1/23/85 Huber Plant Well 4, Twiggs Co.	6.0	54	5.5	--	0.45	7.98	0.54	1.9	--	--	--	--	--	11	--	--
GWN-K8 4/17/85 Laurens Park Mill Well 3, Laurens Co.	6.9	192	3.0	12.0	--	36.90	1.60	2.1	3.1	--	--	--	--	76	--	--
GWN-K10 6/05/85 Ft. Valley Well 1, Peach Co.	5.0	27	3.6	--	0.92	0.93	0.40	2.0	--	--	--	--	--	--	--	--
GWN-K11 6/05/85 Warner Robins Well 1A, Houston Co.	4.9	16	1.5	--	0.24	0.51	0.23	1.0	--	--	--	--	--	--	--	--

Water Quality Analyses for the Cretaceous Aquifer System

STANDARD WATER QUALITY ANALYSES

PARAMETERS		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr	
WELL ID # DATE	UNITS	ug/L																			
LOCATION	DETECT. LIMITS	10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10	OTHER SCREENS TESTED
GWN-K5 7/18/85 Richmond Co. Water Plant #2, Well 101		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	14	--	Hg, 8, 9
GWN-K5 10/21/85 Richmond Co. Water Plant #2, Well 103		--	--	--	10	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	Hg, 8, 9
GWN-K6 1/23/85 Huber Plant Well 4, Twiggs Co.		--	--	--	--	--	--	--	--	--	--	--	--	25	--	--	--	--	12	--	CN
GWN-K8 4/17/85 Laurens Park Mill Well 3, Laurens Co.		--	--	--	--	2,670	32	--	--	--	--	--	--	165	--	--	--	--	--	--	1, 5, 10
GWN-K10 6/05/85 Ft. Valley Well 1, Peach Co.		--	--	--	32	165	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10
GWN-K11 6/05/85 Warner Robins Well 1A, Houston Co.		--	--	--	--	36	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10

Water Quality Analyses for the Cretaceous Aquifer System

STANDARD WATER QUALITY ANALYSES

PARAMETERS	pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL DATE ID # / UNITS	su	umho/cm	mg/L	mg S/L	mg N/L		mg/L						ug/L			
LOCATION / DETECT LIMITS		1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-K12 6/05/85 Perry, Holiday Inn Well, Houston Co.	4.1	47	2.1	8.0	--	0.49	0.25	1.0	--	--	360	--	--	--	--	--
GWN-K13 1/09/85 Omaha Well 1, Stewart Co.	8.9	199	8.3	--	--	1.97	0.03	48.1	0.6	--	*--	--	--	--	--	--
GWN-K15 1/09/85 Georgetown Well 2, Quitman Co.	9.2	323	9.4	3.0	0.03	0.72	0.02	81.3	0.7	--	*--	--	--	--	--	--
GWN-K16 6/05/85 Packaging Corp. of America, North Well, Bibb Co.	5.4	25	2.6	--	0.37	0.75	0.28	3.8	--	--	--	--	--	--	--	--
GWN-K18 1/09/85 Buena Vista Well 3, Marion Co.	4.9	25	3.1	2.0	0.11	0.95	0.36	1.1	0.5	--	55	--	--	--	--	--
GWN-K18 8/29/85 same as above	4.6	29	2.0	5.0	0.10	1.30	0.40	1.5	--	--	51	--	--	--	--	--

*Laboratory detection limit = 50 ug/L.

Water Quality Analyses for the Cretaceous Aquifer System

STANDARD WATER QUALITY ANALYSES

PARAMETERS		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr	
WELL ID # DATE LOCATION	UNITS DETECT. LIMITS	ug/L																			OTHER SCREENS TESTED
		10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10	
GWN-K12 6/05/85 Perry, Holiday Inn Well, Houston Co.		--	--	--	--	235	12	--	--	--	--	--	--	--	--	--	--	--	115	--	1, 5, 10
GWN-K13 1/09/85 Omaha Well 1, Stewart Co.		--	--	--	--	--	--	--	*--	**--	--	--	--	40	--	--	--	--	--	--	1, 3, 5
GWN-K15 1/09/85 Georgetown Well 2, Quitman Co.		--	--	--	--	13	--	--	*--	--	--	--	--	15	--	--	--	--	--	--	10
GWN-K16 6/05/85 Packaging Corp. of America, North Well, Bibb Co.		--	--	--	12	32	--	--	--	--	--	--	--	--	--	--	--	--	17	--	10
GWN-K18 1/09/85 Buena Vista Well 3, Marion Co.		--	--	--	26	54	--	--	*--	60	--	--	--	--	--	--	--	--	10	--	10
GWN-K18 8/29/85 same as above		--	--	--	--	49	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10

*Laboratory detection limit = 25 ug/L.
**Laboratory detection limit = 50 ug/L.

Water Quality Analyses for the Cretaceous Aquifer System

STANDARD WATER QUALITY ANALYSES

PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mg S/L	mg N/L			mg/L					ug/L			
LOCATION	DETECT. LIMITS		1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-K19 7/18/85 Hephzibah, Murphy St. Well, Richmond Co.		5.1	20	2.0	--	0.11	0.42	0.29	2.2	0.5	--	--	--	--	--	--	--
		Dicofol was detected at a concentration of 0.19 ug/L.															
GWN-K19 10/21/85 same as above		5.9	20	2.0	--	0.07	0.50	0.30	2.7	--	--	--	--	--	--	--	--
		Dicofol was not detected															

Water Quality Analyses for the Cretaceous Aquifer System

STANDARD WATER QUALITY ANALYSES

PARAMETERS		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr	
WELL ID # DATE	UNITS										ug/L										
LOCATION	DETECT. LIMITS	10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10	OTHER SCREENS TESTED
GWN-K19 7/18/85 Hephzibah, Murphy St. Well, Richmond Co.		--	--	--	18	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10
GWN-K19 10/21/85 same as above		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	10

Water Quality Analyses for the Jacksonian Aquifer System

STANDARD WATER QUALITY ANALYSES																	
PARAMETERS	pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE / UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION / DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-J1 7/18/85 Vidette Well 1, Burke Co.	7.5	336	10.0	--	2.46	55.70	1.00	3.8	--	--	--	--	--	54	--	--
GWN-J2 7/18/85 Girard Elem. Sch. Well, Burke Co.	7.5	261	2.0	--	0.09	43.20	1.30	2.2	1.8	--	--	--	--	10	--	--
GWN-J3 4/17/85 J.W. Black Well, Canoochee, Emanuel Co.	7.8	241	9.0	--	--	34.1	6.10	9.4	1.7	--	--	--	--	700	--	--
GWN-J4 4/17/85 Wrightsville Well 4 Johnson Co.	7.7	253	4.0	--	0.51	51.1	1.40	2.3	0.9	--	--	--	--	36	--	--
GWN-J5 1/23/85 Cochran Well 3, Bleckley Co.	7.5	339	4.5	12.0	--	67.40	2.41	2.8	1.8	--	--	--	--	--	--	--
GWN-J6 7/18/85 Wrens Well 4, Jefferson Co.	6.6	158	2.0	8.0	--	24.60	1.00	1.6	0.7	--	--	--	--	13	--	--

Water Quality Analyses for the Jacksonian Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # DATE	UNITS	ug/L																		
LOCATION	DETECT. LIMITS	10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10
GWN-J1 7/18/85 Vidette Well 1, Burke Co.		--	--	--	--	--	--	--	--	--	--	--	--	32	--	--	--	--	--	--
GWN-J2 7/18/85 Girard Elem. Sch. Well, Burke Co.		--	--	--	--	43	--	--	--	--	--	--	--	87	--	--	--	--	18	--
GWN-J3 4/17/85 J.W. Black Well, Canoochee, Emanuel Co.		--	--	--	--	91	125	--	--	--	--	--	--	295	--	--	--	--	--	--
GWN-J4 4/17/85 Wrightsville Well 4 Johnson Co.		--	--	--	--	61	--	--	--	--	--	--	--	140	--	--	--	--	13	--
GWN-J5 1/23/85 Cochran Well 3, Bleckley Co.		--	--	--	--	176	25	--	--	--	--	--	--	223	--	--	--	--	--	--
GWN-J6 7/18/85 Wrens Well 4, Jefferson Co.		--	--	--	--	285	13	--	--	--	--	--	--	95	--	--	--	--	--	--

OTHER SCREENS TESTED
1, 3, 5
1, 3, 5, 10
1, 5, 10
1, 5
1, 3, 5, 10
1, 5, 10

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																
		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PA5 4/23/85 Interstate Paper Co. Well 1, Riceboro, Liberty Co.		7.9	321	6.6	36.0	--	27.20	15.20	15.8	2.8	--	--	--	--	31	--	--
GWN-PA5A 12/03/85 Interstate Paper Co. Well 2, Riceboro Liberty Co.		7.5	274	6.9	26.8	--	25.2	13.7	15.8	2.8	--	--	*	--	30	--	--
GWN-PA6 12/03/85 Hinesville Well 5, Liberty Co.		7.6	233	7.9	20.8	--	22.3	11.0	13.8	2.5	--	--	*	--	22	--	--
GWN-PA7 4/23/85 Darien New Well, McIntosh Co.		7.8	562	24.5	130.0	--	46.90	28.70	22.8	2.0	--	--	--	--	50	--	--
GWN-PA7 12/03/85 same as above		7.7	476	23.6	124.0	--	44.0	25.10	22.7	1.9	--	--	*	**	49	--	--

*Laboratory detection limit = 40 ug/L.
**Laboratory detection limit = 20 ug/L.

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # DATE	UNITS	ug/L																		
LOCATION	DETECT. LIMITS	10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10
GWN-PA5 4/23/85 Interstate Paper Co. Well 1, Riceboro, Liberty Co.		--	--	--	--	29	--	--	--	--	--	--	--	460	--	--	--	--	--	--
GWN-PA5 12/03/85 Interstate Paper Co. Well 2, Riceboro, Liberty Co.		--	--	--	--	87	--	--	--	--	--	--	--	430	--	--	--	--	--	--
GWN-PA6 12/03/85 Hinesville Well 5, Liberty Co.		--	--	--	--	--	--	--	--	--	--	--	--	355	--	--	--	--	--	--
GWN-PA7 4/23/85 Darien New Well, McIntosh Co.		--	--	--	--	310	--	--	--	--	--	--	--	760	--	--	--	--	--	--
GWN-PA7 12/03/85 same as above		--	--	--	--	75	--	--	--	--	--	--	--	725	--	--	--	--	--	--

OTHER SCREENS TESTED

Water Quality Analyses for the Floridan Aquifer System

STANDARD WATER QUALITY ANALYSES																	
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L			mg/L					ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PA8 12/03/85 ITT/Rayonier Well, Doctortown, Wayne, Co.		7.9	312	8.4	48.3	--	30.00	15.40	16.0	2.3	--	--	*	--	70	--	--
GWN-PA9A 4/25/85 Brunswick Pulp & Paper TW 1, Brunswick, Glynn Co.		7.7	1,400	227.0	260.0	--	85.40	52.90	106.0	3.2	--	--	--	--	95	--	--
GWN-PA9C 4/25/85 Miller Ball Park TW 25, Brunswick, Glynn Co.		7.7	1,360	299.0	170.0	--	61.20	40.00	134.0	3.8	--	--	--	--	44	--	--
GWN-PA10A 4/23/85 Gilman Paper Co. Well 10, St. Marys, Camden Co.		7.4	717	35.7	160.0	--	70.10	34.00	22.6	2.3	--	--	--	--	32	--	--
GWN-PA10A 12/04/85 same as above		7.4	609	35.0	137.0	--	71.20	31.80	22.8	2.3	--	--	*	--	33	--	--

*Laboratory detection limit = 40 ug/L.

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # / LOCATION	UNITS / DETECT. LIMITS	ug/L																		OTHER SCREENS TESTED
		10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10	
GWN-PA8 12/03/85 ITT/Rayonier Well, Doctortown, Wayne, Co.		--	--	--	--	--	--	--	--	--	--	--	--	535	--	--	--	--	--	--	--
GWN-PA9A 4/25/85 Brunswick Pulp & Paper TW 1, Brunswick, Glynn Co.		--	--	--	--	58	--	--	--	--	--	--	--	1,030	--	--	--	--	--	--	8, 9
GWN-PA9C 4/25/85 Miller Ball Park TW 25, Brunswick, Glynn Co.		--	--	--	--	170	--	--	--	--	--	--	--	990	--	--	--	--	--	--	8, 9
GWN-PA10A 4/23/85 Gilman Paper Co. Well 10, St. Marys, Camden Co.		--	--	--	--	25	--	--	--	--	--	--	--	645	--	--	--	--	--	--	--
GWN-PA10A 12/04/85 same as above		--	--	--	--	17	--	--	--	--	--	--	--	635	--	--	--	--	--	--	--

Water Quality Analyses for the Floridan Aquifer System

STANDARD WATER QUALITY ANALYSES																		
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PA10B 4/23/85 Gilman Paper Co. Well 11, St. Marys, Camden Co.		7.5	867	76.6	190.0	--	72.80	39.00	42.0	2.3	--	--	--	--	36	--	--
GWN-PA10B 12/04/85 same as above		7.5	755	78.9	163.0	--	71.00	35.50	42.8	2.5	--	--	*	--	36	--	--
GWN-PA11 4/23/85 St. Marys Well 2, Camden Co.		7.5	728	35.7	175.0	--	71.10	36.30	21.7	2.0	--	--	--	--	34	--	--
GWN-PA11 12/04/85 same as above		7.7	632	34.5	137.0	4.35	68.10	32.40	21.5	2.1	--	--	*	--	34	--	--
GWN-PA12 4/24/85 Folkston Well 3, Charlton Co.		7.6	687	34.7	155.0	--	69.00	31.10	22.1	2.0	--	--	--	--	31	--	--
GWN-PA12 12/04/85 same as above		7.9	591	31.5	127.0	--	71.50	29.500	22.2	2.2	--	--	*	--	32	--	--

*Laboratory detection limit = 40 ug/L.

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # DATE	UNITS	ug/L																		
LOCATION	DETECT. LIMITS	10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10
GWN-PA10B 4/23/85 Gilman Paper Co. Well 11, St. Marys, Camden Co.		--	--	--	--	52	--	--	--	--	--	--	--	745	--	--	--	--	--	--
GWN-PA10B 12/04/85 same as above		--	--	--	--	27	--	--	--	--	--	--	--	725	--	--	--	--	--	--
GWN-PA11 4/23/85 St. Marys Well 2, Camden Co.		--	--	--	--	23	--	--	--	--	--	--	--	665	--	--	--	--	--	--
GWN-PA11 12/04/85 same as above		--	--	--	--	40	--	--	--	--	--	--	--	630	--	--	--	--	--	--
GWN-PA12 4/24/85 Folkston Well 3, Charlton Co.		--	--	--	--	40	--	--	--	--	--	--	--	570	--	--	--	--	--	--
GWN-PA12 12/04/85 same as above		--	--	--	--	70	--	--	--	--	--	--	--	560	--	--	--	--	--	--

OTHER SCREENS TESTED
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5
1, 5
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Water Quality Analyses for the Floridan Aquifer System

STANDARD WATER QUALITY ANALYSES																		
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PA13 12/04/85 Waycross Well 3, Ware Co.		7.8	363	14.3	47.9	--	41.70	16.80	15.7	1.7	--	--	*	--	70	--	--
GWN-PA14 4/18/85 Statesboro Well 7, Bulloch Co.		8.0	216	4.0	6.0	--	34.10	5.30	6.3	1.4	--	--	--	--	36	--	--
GWN-PA15 4/18/85 King Finishing Co. Well 2, Dover, Screven Co.		7.9	223	4.0	6.0	--	27.00	9.00	7.7	4.1	--	--	--	--	--	--	--
GWN-PA16 4/18/85 Millen Well 1, Jenkins Co.		7.8	251	7.0	7.0	--	45.20	3.10	4.3	2.4	--	--	--	--	--	--	--
GWN-PA17 4/17/85 Swainsboro Well 7, Emanuel Co.		7.8	237	5.0	--	0.03	46.10	2.10	2.8	0.9	--	--	--	--	165	--	--
GWN-PA18 4/18/85 Metter Well 2, Candler Co.		7.9	206	6.0	--	--	30.60	3.50	9.6	2.1	--	--	--	--	25	--	--

*Laboratory detection limit = 40 ug/L.

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # / LOCATION	DATE / UNITS / DETECT. LIMITS	ug/L																		OTHER SCREENS TESTED
		10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10	
GWN-PA13 Waycross Well 3, Ware Co.	12/04/85	--	--	--	--	22	--	--	--	--	--	--	--	345	--	--	--	--	--	--	8, 9
GWN-PA14 Statesboro Well 7, Bulloch Co.	4/18/85	--	--	--	--	81	37	--	--	--	--	--	--	200	--	--	--	--	1.6	--	--
GWN-PA15 King Finishing Co. Well 2, Dover, Screven Co.	4/18/85	--	--	--	--	225	--	--	--	--	--	--	--	425	--	--	--	--	--	--	CN
GWN-PA16 Millen Well 1, Jenkins Co.	4/18/85	--	--	--	--	24	33	--	--	--	--	--	--	200	--	--	--	--	--	--	1, 5
GWN-PA17 Swainsboro Well 7, Emanuel Co.	4/17/85	--	--	--	--	--	--	--	--	--	--	--	--	180	--	--	--	--	--	--	--
GWN-PA18 Metter Well 2, Candler Co.	4/18/85	--	--	--	--	--	59	--	--	--	--	--	--	60	--	--	--	--	--	--	--

Water Quality Analyses for the Floridan Aquifer System

STANDARD WATER QUALITY ANALYSES																	
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PA20 3/28/85 Lakeland Well 2, Lanier Co.		7.7	357	3.0	64.0	--	41.50	15.60	4.7	0.8	--	12	--	--	27	--	--
GWN-PA20 8/06/85 same as above		7.7	373	4.0	66.0	--	44.70	16.00	4.7	0.9	--	--	--	--	27	--	--
GWN-PA21 3/28/85 Valdosta Well 1, Lowndes Co.		8.1	221	5.0	30.0	1.38	32.80	4.25	2.9	--	--	--	--	--	41	--	--
GWN-PA21 8/07/85 same as above		7.8	234	5.0	34.0	--	35.60	4.10	3.6	--	--	--	--	--	43	--	--
GWN-PA22 3/27/85 Thomasville Well 6, Thomas Co.		7.8	408	8.0	76.0	--	44.20	20.60	7.5	1.0	--	--	--	--	24	--	--
GWN-PA22 12/12/85 same as above		7.8	375	6.3	55.8	0.04	44.00	20.10	7.0	1.1	--	--	*	--	24	--	--

*Laboratory detection limit = 40 ug/L.

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																			
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr	
WELL ID # / LOCATION	DATE / UNITS / DETECT. LIMITS	ug/L																			OTHER SCREENS TESTED
		10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10	
GWN-PA20 Lakeland Well 2, Lanier Co.	3/28/85	--	--	--	--	20	--	--	--	--	--	--	--	185	--	--	--	--	--	--	--
GWN-PA20 same as above	8/06/85	--	--	--	--	36	--	--	--	*	--	--	--	190	--	--	--	--	--	--	10
GWN-PA21 Valdosta Well 1, Lowndes Co.	3/28/85	--	--	--	--	--	--	--	--	--	--	--	--	51	--	--	--	--	--	--	1, 5, 8, 9, 10
GWN-PA21 same as above	8/07/85	--	--	--	--	19	--	--	--	--	--	--	--	55	--	--	--	--	20	--	1, 5, 8, 9, 10
GWN-PA22 Thomasville Well 6, Thomas Co.	3/27/85	--	--	--	--	--	--	--	--	--	--	--	--	345	--	--	--	--	--	--	--
GWN-PA22 same as above	12/12/85	--	--	--	--	--	--	--	--	--	--	--	--	335	--	--	12	--	--	--	--

*Laboratory detection limit = 10 ug/L.

Water Quality Analyses for the Floridan Aquifer System

STANDARD WATER QUALITY ANALYSES																		
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PA23 3/27/85 Cairo Well 8, Grady Co.		8.0	350	7.0	34.0	0.08	38.40	17.90	11.6	2.0	--	--	--	--	135	--	--
GWN-PA23 12/12/85 same as above		8.0	319	5.2	35.9	--	35.20	16.60	10.6	1.9	--	--	* --	--	135	--	--
GWN-PA24 3/27/85 Bainbridge Well 1, Decatur Co.		8.0	209	4.0	--	--	35.60	3.33	1.7	--	--	--	--	--	--	--	--
GWN-PA24 8/07/85 same as above		7.9	218	3.0	3.0	1.19	36.50	3.10	2.0	--	--	--	--	--	--	--	--
GWN-PA25 3/27/85 Donalsonville East 7th Street Well, Seminole Co.		7.6	276	5.0	--	0.99	50.90	0.58	3.4	--	--	--	--	--	--	--	--
GWN-PA25 8/07/85 same as above		7.5	285	5.0	--	1.31	51.70	0.60	3.6	--	--	--	--	--	--	--	--

*Laboratory detection limit = 40 ug/L.

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # / LOCATION	DATE / UNITS / DETECT. LIMITS	ug/L																		OTHER SCREENS TESTED
		10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10	
GWN-PA23 Cairo Well 8, Grady Co.	3/27/85	--	--	--	15	315	--	33	--	--	--	--	--	380	--	--	--	--	--	--	10
GWN-PA23 same as above	12/12/85	--	--	--	--	54	--	41	--	--	--	--	--	345	--	--	--	--	22	--	10
GWN-PA24 Bainbridge Well 1, Decatur Co.	3/27/85	--	--	--	--	--	--	--	*	--	--	--	--	35	--	--	--	--	--	--	1, 3, 5, 7, 10
GWN-PA24 same as above	8/07/85	--	--	--	--	--	--	--	--	--	--	--	--	37	--	--	--	--	15	--	1, 3, 5, 7, 10
GWN-PA25 Donalsonville East 7th Street Well, Seminole Co.	3/27/85	--	--	--	--	--	--	--	--	--	--	--	--	24	--	--	--	--	--	--	CN, 1, 3, 5, 10
GWN-PA25 same as above	8/07/85	--	--	--	--	--	--	--	--	--	--	--	--	25	--	--	--	--	16	--	CN, 1, 3, 5, 10

*Laboratory detection limit = 50 ug/L.

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES															
		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PA25 12/12/85 Donalsonville East 7th Street Well, Seminole Co.		7.7	261	4.2	--	1.24	53.10	0.60	3.4	0.5	--	--	*	--	--	--	--
GWN-PA26 3/27/85 Colquitt Well 3, Miller Co.		7.7	218	3.0	--	1.08	40.20	0.49	1.9	--	--	--	--	--	--	--	--
GWN-PA26 8/07/85 same as above		7.6	230	4.0	--	1.41	41.70	0.50	2.1	--	--	--	--	--	--	--	--
GWN-PA26 12/12/85 same as above		7.6	208	2.1	--	1.26	42.70	0.50	1.9	--	--	--	*	--	--	--	--
GWN-PA27 3/26/85 Camilla New Well, Mitchell Co.		7.8	224	3.0	--	1.09	40.90	1.18	1.6	0.5	--	--	--	--	10	--	--
GWN-PA27 8/08/85 same as above		7.7	240	2.0	--	0.40	43.10	1.20	1.9	--	--	--	--	--	--	--	--

*Laboratory detection limit = 40 ug/L.

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																			
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr	
WELL ID # / LOCATION	DATE / UNITS / DETECT. LIMITS	10	10	10	10	10	10	10	20	25	ug/L 50	3	50	10	10	50	10	10	10	10	OTHER SCREENS TESTED
GWN-PA25 Donalsonville East 7th Street Well, Seminole Co.	12/12/85	--	--	--	--	11	--	--	--	--	--	--	--	25	--	--	--	--	--	--	CN, 1, 3, 5, 10
GWN-PA26 Colquitt Well 3, Miller Co.	3/27/85	--	--	--	--	--	--	--	--	--	--	--	--	18	--	--	--	--	--	--	1, 3, 5, 10
GWN-PA26 same as above	8/07/85	--	--	--	--	--	--	--	--	--	--	--	--	20	--	--	--	--	19	--	1, 3, 5, 10
GWN-PA26 same as above	12/12/85	--	--	--	--	11	--	--	--	--	--	--	--	20	--	--	--	--	--	--	1, 3, 5, 10
GWN-PA27 Camilla New Well, Mitchell Co.	3/26/85	--	--	--	--	--	--	--	--	--	--	--	--	37	--	--	--	--	--	--	1, 3, 5, 8, 9, 10
GWN-PA27 same as above	8/08/85	--	--	--	--	--	--	--	--	--	--	--	--	37	--	--	--	--	17	--	1, 3, 5, 8, 9, 10

Water Quality Analyses for the Floridan Aquifer System

STANDARD WATER QUALITY ANALYSES																		
PARAMETERS	pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE / UNITS	su	umho/cm	mg/L	mgS/L	mgN/L			mg/L					ug/L			
LOCATION / DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PA28 3/26/85 Moultrie Well 1, Colquitt Co.	7.9	469	10.0	105.0	0.27	34.20	19.60	27.5	4.1	--	--	--	--	95	--	--
GWN-PA29 3/28/85 Adel Well 6, Cook Co.	7.8	365	4.0	60.0	0.07	45.20	16.20	3.7	1.0	--	14	--	--	14	--	--
GWN-PA29 8/06/85 same as above	7.7	403	4.0	95.0	--	48.00	16.90	3.7	0.8	--	--	--	--	12	--	--
GWN-PA30 3/28/85 Nashville Mills Well 2, Nashville, Berrien Co.	7.8	345	5.0	56.0	0.02	38.60	15.60	4.9	1.0	--	12	--	--	52	--	--
GWN-PA30 8/06/85 same as above	7.8	356	5.0	64.0	0.02	41.10	15.80	4.9	1.2	--	--	--	--	52	--	--
GWN-PA31 3/25/85 Tifton Well 6, Tift Co.	7.7	269	4.0	--	0.04	44.30	7.30	2.6	0.5	--	--	--	--	200	--	--

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # / LOCATION	UNITS / DETECT. LIMITS	ug/L																		
		10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10
GWN-PA28 3/26/85 Moultrie Well 1, Colquitt Co.		--	--	--	--	--	--	--	--	--	--	--	--	2,050	--	--	--	--	18	--
GWN-PA29 3/28/85 Adel Well 6, Cook Co.		--	--	--	--	55	31	--	--	--	--	--	--	315	--	--	--	--	--	--
GWN-PA29 8/06/85 same as above		--	--	--	--	55	28	--	--	--	--	--	--	325	--	--	--	--	--	--
GWN-PA30 3/28/85 Nashville Mills Well 2, Nashville, Berrien Co.		--	--	--	--	--	--	--	--	--	--	--	--	225	--	--	--	--	--	--
GWN-PA30 8/06/85 same as above		--	--	--	--	21	--	--	--	--	--	--	--	230	--	--	--	--	--	--
GWN-PA31 3/25/85 Tifton Well 6, Tift Co.		--	--	--	--	410	60	--	--	--	--	--	--	215	--	--	--	--	35	--

OTHER SCREENS TESTED
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CN, 1, 5, 10
CN, 1, 5, 10
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Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																
		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PA34 1/23/85 McRae Well 1, Telfair Co.		7.7	313	5.5	--	--	47.40	9.34	4.5	2.1	--	--	--	--	248	--	--
GWN-PA35 1/24/85 Mt. Vernon New Well, Montgomery Co.		8.0	246	3.9	7.0	--	NA	NA	NA	NA	--	--	--	--	87	--	--
GWN-PA36 1/24/85 Vidalia Well 1, Toombs Co.		8.0	221	4.5	--	--	29.80	4.49	10.5	2.5	--	--	--	--	169	--	--
GWN-PA38 1/23/85 Eastman Well 4, Dodge Co.		7.7	249	4.5	--	0.18	48.70	1.56	2.2	1.2	--	--	--	--	110	--	--
GWN-PA39 3/26/85 Sylvester Well 1, Worth Co.		7.6	289	3.0	--	0.83	45.60	7.04	3.4	1.1	--	--	--	--	195	--	--
GWN-PA39 8/07/85 same as above		7.6	299	3.0	3.0	0.05	46.80	6.80	3.6	1.0	--	--	--	--	200	--	--

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # DATE	UNITS	ug/L																		
LOCATION	DETECT. LIMITS	10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10
GWN-PA34 1/23/85 McRae Well 1, Telfair Co.		--	--	--	--	172	91	--	--	--	--	--	--	711	--	--	--	--	--	--
GWN-PA35 1/24/85 Mt. Vernon New Well, Montgomery Co.		--	--	--	--	40	26	--	--	--	--	--	--	462	--	--	--	--	--	--
GWN-PA36 1/24/85 Vidalia Well 1, Toombs Co.		--	--	--	--	16	38	--	--	--	--	--	--	323	--	--	--	--	--	--
GWN-PA38 1/23/85 Eastman Well 4, Dodge Co.		--	--	--	--	--	--	--	--	--	--	--	--	130	--	--	--	--	--	--
GWN-PA39 3/26/85 Sylvester Well 1, Worth Co.		--	--	--	--	--	--	--	--	--	--	--	--	360	--	--	--	--	--	--
GWN-PA39 8/07/85 same as above		--	--	--	--	10	--	--	--	--	--	--	--	360	--	--	--	--	--	--

OTHER SCREENS TESTED
--
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CN
1, 3, 5, 10
1, 3, 5, 10
1, 3, 5, 10

Water Quality Analyses for the Floridan Aquifer System

STANDARD WATER QUALITY ANALYSES																	
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PA40 3/26/85 Merck Chem. Co. Well 8, Albany, Dougherty Co.		7.6	267	4.0	--	--	48.90	1.04	2.1	--	--	--	--	--	14	--	--
GWN-PA40 8/08/85 same as above		7.5	275	3.0	2.0	1.06	53.80	1.10	2.4	0.5	--	--	--	--	15	--	--
GWN-PA41 12/09/85 Test Well 13, Albany, Dougherty Co.		7.0	570	13.5	29.4	2.08	107.00	3.00	19.5	2.7	--	49	--	--	49	--	--
1,1-Dichloroethylene (4.2 ug/L), Trichloroethylene (1.7ug/L), and Tetrachloroethylene (3.2 ug/L) was detected.																	
GWN-PA42 12/10/85 Garrett Observation Well, Lee Co.		7.2	160	6.3	--	2.60	30.20	0.50	2.3	--	--	155	*	--	--	--	--
GWN-PA43 3/26/85 Newton Well 1, Baker Co.		8.0	227	4.0	--	1.12	39.80	1.05	2.8	--	--	--	--	--	--	--	--
GWN-PA43 8/07/85 same as above		7.8	231	2.0	2.0	1.29	41.60	0.90	2.4	--	--	--	--	--	--	--	--

*Laboratory detection limit = 40 ug/L.

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # / LOCATION	DATE / UNITS / DETECT. LIMITS	10	10	10	10	10	10	10	20	25	ug/L 50	3	50	10	10	50	10	10	10	10
GWN-PA40 Merck Chem. Co. Well 8, Albany, Dougherty Co.	3/26/85	--	--	--	--	--	--	--	--	--	--	--	--	49	--	--	--	--	--	--
GWN-PA40 same as above	8/08/85	--	--	--	--	--	--	--	--	--	--	--	--	51	--	--	--	--	36	--
GWN-PA41 Test Well 13, Albany, Dougherty Co.	12/09/85	--	--	--	--	99	62	--	--	--	--	--	--	86	--	--	--	--	13	--
GWN-PA42 Garrett Observation Well, Lee Co.	12/10/85	--	--	--	--	53	--	--	--	--	--	--	--	16	--	--	--	--	145	--
GWN-PA43 Newton Well 1, Baker Co.	3/26/85	--	--	--	--	--	--	--	--	--	--	--	--	44	--	--	--	--	--	--
GWN-PA43 same as above	8/07/85	--	--	--	--	--	--	--	--	--	--	--	--	39	--	--	--	--	--	--

OTHER SCREENS TESTED
CN
CN
CN, 1, 3, 5, 7, 10
CN
1, 3, 5, 10
CN, 1, 3, 5, 10

Water Quality Analyses for the Floridan Aquifer System

STANDARD WATER QUALITY ANALYSES																		
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PA44 3/25/85 Sycamore Well 2, Turner Co.		7.8	189	3.0	--	--	30.90	4.23	2.3	0.6	--	--	--	--	140	--	--
GWN-PA45 1/10/85 Abbeville Well 2, Wilcox Co.		7.3	260	4.2	4.0	0.04	44.70	3.85	2.3	2.1	--	*	--	--	12	--	--
GWN-PA46 1/10/85 Vet. Memorial State Pk. New Well, Crisp Co.		7.6	287	4.2	--	--	52.60	1.96	2.6	1.6	--	*	--	--	--	--	--
GWN-PA48 12/12/85 Harvey TW 1, Jakin, Early Co.		7.7	222	3.1	2.4	1.68	48.00	0.60	2.1	--	--	--	**	--	--	--	--

*Laboratory detection limit = 50 ug/L.
**Laboratory detection limit = 40 ug/L.

Water Quality Analyses for the Floridan Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # / LOCATION	DATE / UNITS / DETECT. LIMITS	ug/L																		OTHER SCREENS TESTED
		10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10	
GWN-PA44 Sycamore Well 2, Turner Co.	3/25/85	--	--	--	--	--	--	--	--	--	--	--	--	280	--	--	--	--	--	--	1, 3, 5, 10
GWN-PA45 Abbeville Well 2, Wilcox Co.	1/10/85	--	--	--	--	33	--	--	* --	--	--	--	--	230	--	--	--	--	--	--	1, 3, 5, 10
GWN-PA46 Vet. Memorial State Pk. New Well, Crisp Co.	1/10/85	--	--	--	--	75	--	--	* --	** --	--	--	--	215	--	--	--	--	--	--	1, 3, 5, 10
GWN-PA48 Harvey TW 1, Jakin Early Co.	12/12/85	--	--	--	--	95	--	--	--	--	--	--	--	23	--	--	--	--	--	--	CN, 1, 3, 5, 10

*Laboratory detection limit = 25 ug/L.
**Laboratory detection limit = 50 ug/L.

Water Quality Analyses for the Providence Aquifer System

STANDARD WATER QUALITY ANALYSES																		
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-PD1 12/10/85 Test Well 10, Albany, Dougherty Co.		9.0	338	2.1	9.7	--	14.30	0.90	85.3	1.7	--	760	--	--	--	--	--
GWN-PD2 1/09/85 Preston Well 1, Webster Co.		5.7	47	5.2	--	0.76	6.13	0.48	1.5	1.0	--	*	--	--	21	--	--
GWN-PD3 6/06/85 Ft. Gaines Well 2, Clay Co.		8.3	383	9.8	9.0	--	5.50	1.00	78.0	1.5	--	--	--	--	--	--	--
GWN-PD4 6/06/85 Americus Well 4, Sumter Co.		7.2	180	1.5	9.0	--	27.70	1.90	2.5	2.9	--	--	--	--	--	--	--

*Laboratory detection limit = 50 ug/L.

Water Quality Analyses for the Providence Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # DATE	UNITS										ug/L									
LOCATION	DETECT. LIMITS	10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10
GWN-PD1 12/10/85 Test Well 10, Albany, Dougherty Co.		--	--	--	--	835	--	--	--	--	--	--	--	115	11	--	--	--	20	--
GWN-PD2 1/09/85 Preston Well 1, Webster Co.		--	--	--	11	83	--	--	*	--	--	--	--	11	--	--	--	--	--	--
GWN-PD3 6/06/85 Ft. Gaines Well 2, Clay Co.		--	--	--	--	31	--	--	--	--	--	--	--	100	--	--	--	--	--	--
GWN-PD4 6/06/85 Americus Well 4, Sumter Co.		--	--	--	--	96	11	--	--	--	--	--	--	225	--	--	--	--	15	--

*Laboratory detection limit = 25 ug/L.

OTHER SCREENS TESTED
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1, 3, 5, 10
--
1, 3, 5, 10

Water Quality Analyses for the Clayton (CT) and Claiborne (CL) Aquifer Systems

STANDARD WATER QUALITY ANALYSES																	
PARAMETERS	pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE / UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION / DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-CT3 6/06/85 Dawson, Crawford Street Well, Terrell Co.	7.7	260	1.5	13.0	--	36.90	4.20	6.6	1.9	--	--	--	--	--	--	--
GWN-CL4 1/09/85 Plains Well 3, Sumter Co.	4.7	68	9.4	--	1.15	2.23	1.61	5.6	1.2	--	65	--	--	22	--	--
GWN-CL7 1/10/85 Cordele Well 2, Crisp Co.	7.6	252	4.2	4.0	--	46.20	1.62	2.1	0.9	--	*	--	--	--	--	--

*Laboratory detection limit = 50 ug/L.

Water Quality Analyses for the Clayton (CT) and Claiborne (CL) Aquifer Systems

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # DATE LOCATION	UNITS DETECT. LIMITS	10	10	10	10	10	10	10	20	25	ug/L 50	3	50	10	10	50	10	10	10	10	OTHER SCREENS TESTED
GWN-CT3 6/06/85 Dawson, Crawford Street Well, Terrell Co.		--	--	--	--	37	--	--	--	--	--	--	--	420	--	--	--	--	--	--	1, 3, 5, 10
GWN-CL4 1/09/85 Plains Well 3, Sumter Co.		--	--	--	22	37	67	--	*	--	--	--	--	18	--	--	--	16	12	--	1, 3, 5, 10
GWN-CL7 1/10/85 Cordele Well 2, Crisp Co.		--	--	--	--	15	--	--	*	**	--	--	--	285	--	--	--	--	--	--	10

*Laboratory detection limit = 25 ug/L.
**Laboratory detection limit = 50 ug/L.

Water Quality Analyses for the Miocene Aquifer System

STANDARD WATER QUALITY ANALYSES																		
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-MI1 3/28/85 McMillan Well, Adel, Cook Co.		8.0	234	3.0	4.0	--	21.60	13.20	6.6	1.5	--	14	--	--	20	--	--
GWN-MI1 8/06/85 same as above		7.8	249	4.0	4.0	0.02	22.40	13.10	6.4	1.5	--	--	--	--	18	--	--
GWN-MI2 3/28/85 Boutwell Well, Hahira, Lowndes Co.		5.0	45	7.0	--	--	1.13	0.64	5.4	--	--	96	--	--	--	--	--
GWN-MI2 8/06/85 same as above		5.8	42	3.0	3.0	0.42	3.10	1.00	2.9	0.8	--	27	--	--	--	--	--
GWN-MI3 4/25/85 Coffin Park TW2, Brunswick, Glynn Co.		7.7	497	23.5	38.0	--	63.70	10.80	18.9	4.1	--	--	--	--	11	--	--

Water Quality Analyses for the Miocene Aquifer System

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # DATE	UNITS	ug/L																		
LOCATION	DETECT. LIMITS	10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10
GWN-MI1 3/28/85 McMillan Well, Adel, Cook Co.		--	--	--	--	14	--	--	--	--	--	--	--	115	--	--	--	--	70	--
GWN-MI1 8/06/85 same as above		--	--	--	--	--	13	--	--	--	--	--	--	110	--	--	--	--	40	--
GWN-MI2 3/28/85 Boutwell Well, Hahira, Lowndes Co.		--	--	--	12	18	--	--	--	--	--	--	--	--	--	--	--	--	590	--
GWN-MI2 8/06/85 same as above		--	--	--	19	82	--	--	--	--	--	--	--	--	--	--	--	--	--	--
GWN-MI3 4/25/85 Coffin Park TW2, Brunswick, Glynn Co.		--	--	--	--	505	15	--	--	--	--	--	--	455	--	--	--	--	11	--

OTHER SCREENS TESTED
CN, 1, 5, 10
CN, 1, 5, 10
1, 5, 8, 9, 10
1, 5, 8, 9, 10
10

Water Quality Analyses for the Piedmont Unconfined Aquifers

STANDARD WATER QUALITY ANALYSES																	
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-P1 1/08/85 Luthersville New Well, Meriwether Co.		6.4	121	5.2	11.0	--	6.67	2.28	15.2	2.9	--	*	--	--	--	--	--
GWN-P2 7/16/85 Riverdale Delta Drive Well, Clayton Co.		6.1	187	50.0	--	1.20	5.80	1.33	26.2	1.8	--	--	--	--	41	--	--
		Chloroform (12ug/L) and Dichlorobromomethane (2ug/L) were detected.															
GWN-P2 10/21/85 same as above		6.1	101	3.0	--	1.25	9.00	1.30	8.9	1.7	--	--	--	--	30	--	--
GWN-P3 11/27/85 Fort McPherson, Fulton Co.		7.0	96	2.4	10.2	--	7.60	2.00	8.5	2.7	--	175	**	--	13	--	--
GWN-P4 7/26/85 Sonoco Prod. Well, Atlanta, Fulton Co.		8.2	480	36.0	39.0	0.08	57.40	11.50	16.4	1.7	--	--	--	--	--	--	--

*Laboratory detection limit = 50 ug/L.
**Laboratory detection limit = 40 ug/L.

Water Quality Analyses for the Piedmont Unconfined Aquifers

PARAMETERS	STANDARD WATER QUALITY ANALYSES																		
	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # / LOCATION — DATE / UNITS	ug/L																		
DETECT. LIMITS	10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10
GWN-P1 1/08/85 Luthersville New Well, Meriwether Co.	--	--	--	--	2,600	54	--	*	--	--	--	--	90	--	--	--	--	--	17
GWN-P2 7/16/85 Riverdale Delta Drive Well, Clayton Co.	--	--	--	--	16	10	--	--	--	--	--	--	76	--	--	--	--	--	--
GWN-P2 10/21/85 same as above	--	--	--	--	--	17	--	--	--	--	--	--	72	--	--	--	--	--	--
GWN-P3 11/27/85 Fort McPherson, Fulton Co.	--	--	--	--	1,650	36	--	--	--	--	--	--	60	15	--	--	--	20	--
GWN-P4 7/26/85 Sonoco Prod. Well Atlanta, Fulton Co.	--	--	--	--	--	15	--	--	--	--	--	--	355	--	--	--	--	--	--

OTHER SCREENS TESTED
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*Laboratory detection limit = 25 ug/L.

Water Quality Analyses for the Piedmont Unconfined Aquifers

STANDARD WATER QUALITY ANALYSES																		
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-P6 1/08/85 Talbot Co. Oak Mountain Well		5.5	17	2.1	4.0	0.13	1.59	0.27	0.9	1.1	--	* --	--	--	12	--	--
GWN-P7 1/08/85 Hampton Well 6, Henry Co.		6.4	121	3.1	3.0	0.23	9.87	4.30	7.8	1.7	--	** --	--	--	50	--	--
GWN-P12 1/08/85 Nabisco Plant Well 1, Woodbury, Meriwether Co.		6.8	109	11.5	5.0	1.05	10.60	1.45	6.6	2.5	--	145	--	--	21	--	--
GWN-P14 1/08/85 Upson Co. Sunset Village Well		5.3	19	3.1	--	0.42	0.22	0.24	1.9	1.7	--	** --	--	--	30	--	--
GWN-P15 7/26/85 Sanford Well, Avondale Estates, Dekalb Co.		7.4	164	7.0	7.0	--	17.00	4.30	7.7	4.7	--	--	--	--	61	--	--

*Laboratory detection limit = 200 ug/L.
**Laboratory detection limit = 50 ug/L.

Water Quality Analyses for the Piedmont Unconfined Aquifers

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # / LOCATION	UNITS / DETECT. LIMITS	ug/L																		
		10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10
GWN-P6 1/08/85 Talbot Co. Oak Mountain Well		--	--	--	* --	4,520	29	--	** --	--	--	--	*** --	--	--	--	--	--	100	**** --
GWN-P7 1/08/85 Hampton Well 6, Henry Co.		--	--	--	--	185	--	--	** --	--	--	--	--	70	--	--	--	--	--	--
GWN-P12 1/08/85 Nabisco Plant Well 1, Woodbury, Meriwether Co.		--	--	15	19	1,340	45	--	** --	--	--	--	--	47	--	--	--	--	13	--
GWN-P14 1/08/85 Upson Co. Sunset Village Well		--	--	--	--	--	--	--	** --	--	--	--	--	--	--	--	--	--	16	--
GWN-P15 7/26/85 Sanford Well, Avondale Estates, Dekalb Co.		--	--	--	--	320	64	--	--	--	--	--	--	92	--	--	--	--	170	--

OTHER SCREENS TESTED
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* Laboratory detection limit = 50 ug/L.
** Laboratory detection limit = 25 ug/L.
*** Laboratory detection limit = 60 ug/L.
**** Laboratory detection limit = 15 ug/L.

Water Quality Analyses for the Valley and Ridge Unconfined Aquifers

STANDARD WATER QUALITY ANALYSES																	
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-VR1 3/07/85 Floyd Co. Kingston Road Well		7.9	218	1.1	--	0.50	22.40	13.30	1.0	--	--	--	--	--	--	--	--
GWN-VR2 3/06/85 Tri-County Hosp. Cooling Tower Well, Ft. Oglethorpe, Catoosa Co.		7.0	778	124.8	23.0	0.49	67.00	25.90	50.1	0.7	--	34	--	--	42	--	--
GWN-VR2 9/19/85 same as above		7.7	847	124.1	19.0	0.77	74.40	27.90	49.6	0.9	--	--	--	--	40	--	--
GWN-VR3 3/07/85 Crawfish Spring, Chickamauga, Walker Co.		7.5	224	1.1	--	0.67	25.80	11.60	1.1	0.5	--	--	--	--	66	--	--
GWN-VR3 8/14/85 same as above		7.6	245	1.0	2.0	0.75	28.10	12.70	1.0	0.6	--	--	--	--	72	--	--

Water Quality Analyses for the Valley and Ridge Unconfined Aquifers

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # / LOCATION	DATE / UNITS / DETECT. LIMITS	10	10	10	10	10	10	10	20	25	50 ug/L	3	50	10	10	50	10	10	10	10
GWN-VR1 Floyd Co. Kingston Road Well	3/07/85	--	--	--	--	--	--	--	--	--	--	--	--	14	--	--	--	--	--	--
GWN-VR2 Tri-County Hosp. Cooling Tower Well Ft. Oglethorpe, Catoosa Co.	3/06/85	--	--	--	--	52	57	--	--	--	--	--	--	96	--	--	--	--	--	--
GWN-VR2 same as above	9/19/85	--	--	--	12	50	62	--	--	--	--	--	--	99	--	--	--	--	--	--
GWN-VR3 Crawfish Spring, Chickamauga, Walker Co.	3/07/85	--	--	--	--	--	--	--	--	--	--	--	--	23	--	--	--	--	--	--
GWN-VR3 same as above	8/14/85	--	--	--	--	--	--	--	--	--	--	--	--	23	--	--	--	--	--	--

OTHER SCREENS TESTED
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Water Quality Analyses for the Valley and Ridge Unconfined Aquifers

STANDARD WATER QUALITY ANALYSES																		
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-VR4 8/14/85 Std. Coosa Thatcher Well 2, Rossville, Walker Co.		7.9	614	15.1	52.0	--	78.00	20.80	15.4	3.2	--	--	--	--	120	--	--
GWN-VR5 3/07/85 Chattooga Co. Well 4, Trion		7.3	367	6.8	--	3.30	60.50	3.25	4.9	1.2	--	--	--	--	95	--	--
GWN-VR6 3/06/85 Chem. Prod. Corp. East Well, Cartersville, Bartow Co.		7.9	255	4.5	--	0.65	24.30	14.60	3.8	0.9	--	--	--	--	820	--	--
GWN-VR7 3/06/85 Lewis Spring, Adairsville, Bartow Co.		7.6	203	1.1	--	0.40	22.10	11.60	0.7	0.7	--	28	--	--	27	--	--

Water Quality Analyses for the Valley and Ridge Unconfined Aquifers

PARAMETERS	STANDARD WATER QUALITY ANALYSES																		
	Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # DATE / LOCATION	UNITS: ug/L																		
DETECT. LIMITS	10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10
GWN-VR4 8/14/85 Std. Coosa Thatcher Well 2, Rossville, Walker Co.	--	--	--	--	170	29	--	--	--	--	--	--	860	--	--	--	--	--	--
GWN-VR5 3/07/85 Chattooga Co. Well 4, Trion	--	--	--	--	--	--	--	--	--	--	--	--	160	--	--	--	--	--	--
GWN-VR6 3/06/85 Chem. Prod. Corp. East Well, Cartersville, Bartow Co.	--	--	--	--	--	--	--	--	--	--	--	--	245	--	--	--	--	--	--
GWN-VR7 3/06/85 Lewis Spring, Adairsville, Bartow Co.	--	--	--	--	11	--	--	--	--	--	--	--	18	--	--	--	--	--	--

OTHER SCREENS TESTED
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Water Quality Analyses for the Valley and Ridge Unconfined Aquifers

STANDARD WATER QUALITY ANALYSES																	
PARAMETERS		pH	Spec. Cond.	Cl	SO_4	NO_2+ NO_3	Ca	Mg	Na	K	Ag	Al	As	Au	Ba	Be	Bi
WELL ID # DATE	UNITS	su	umho/cm	mg/L	mgS/L	mgN/L		mg/L						ug/L			
LOCATION	DETECT. LIMITS	--	1	0.1	2.0	0.02	0.00	0.00	0.0	0.5	10	20	50	25	10	10	50
GWN-VR8 3/07/85 Cedartown Spring, Polk Co.		7.6	256	2.3	--	0.63	28.50	13.60	1.3	--	--	--	--	--	12	--	--
GWN-VR9 8/14/85 Polk Co. Well 2		7.6	271	2.0	2.0	1.04	34.70	12.00	1.2	--	--	--	--	--	--	--	--

Water Quality Analyses for the Valley and Ridge Unconfined Aquifers

PARAMETERS		STANDARD WATER QUALITY ANALYSES																		
		Cd	Co	Cr	Cu	Fe	Mn	Mo	Ni	Pb	Sb	Se	Sn	Sr	Ti	Tl	V	Y	Zn	Zr
WELL ID # / LOCATION	DATE / UNITS / DETECT. LIMITS										ug/L									
		10	10	10	10	10	10	10	20	25	50	3	50	10	10	50	10	10	10	10
GWN-VR8 Cedartown Spring, Polk Co.	3/07/85	--	--	--	--	12	--	--	--	--	--	--	--	20	--	--	--	--	--	--
GWN-VR9 Polk Co. Well 2	8/14/85	--	--	--	--	15	--	--	--	--	--	--	--	25	--	--	--	--	--	--

OTHER SCREENS TESTED
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