WATER AND SEWER SYSTEM MASTER PLAN UPDATE

CLAY COUNTY WATER AND SEWER DISTRICT

CLAY COUNTY, NORTH CAROLINA

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SECTION I. INTRODUCTION

A. SCOPE OF WORK

The purpose of this study is to examine the Clay County Water and Sewer District's (CCWSD) water and sewer systems and recommend alternatives by which the CCWSD may upgrade and expand these systems to meet current and future needs. Final recommendations are presented in a phased manner so that the CCWSD may implement these recommendations in a manner that will minimize increases in user fees. This study also identifies the costs associated with the implementation of the recommended improvements.

This study relies on background information contained in the following documents:

"Preliminary Engineering Report, Water System Improvements, Clay County, North Carolina," dated September 1999, authored by McGill Associates, P.A.

"Preliminary Engineering Report, Improvements to Facilitate Water System Interconnection with Towns County (Georgia) Water and Sewer Authority, Clay County Water and Sewer District, Clay County, North Carolina," dated September, 1999, authored by McGill Associates, P.A.

"Preliminary Engineering Report and Environmental Assessment, Wastewater Collection System Improvements, Clay County Water and Sewer District, Clay County, North Carolina," dated March, 1999, authored by McGill Associates, P.A.

"Preliminary Engineering Report, Water and Sewer Improvements, Clay County Water and Sewer District, Clay County, North Carolina", dated March, 1995, authored by McGill Associates, P.A.

"Water and Sewer Study, Town of Hayesville, North Carolina, Clay County, North Carolina", dated May, 1991, authored by McGill Associates, P.A.

B. PROJECT AREA

Clay County is located in the southwestern portion of North Carolina. Cherokee County, North Carolina, from which it was created in 1861, borders the county on the north and west. Macon County, North Carolina borders the county on the north and east, while Union, Towns, and Rabun Counties in Georgia, border Clay County to the south.

Clay County has a total land area of 214 square miles. Forty-six percent of this land is federally owned, with the majority of this land lying in the Nantahala National Forest. The Chatuge Lake Reservoir, which was constructed by the Tennessee Valley Authority (TVA) in 1941, comprises the remaining federally owned land. The earthen dam forming the lake impounds the Hiwassee River for power generation and recreational purposes. This lake also serves as the water supply for the Town of Hiawassee and a portion of Towns County, Georgia. Clay County is primarily mountainous, with slopes greater than 15 percent covering 86 percent of the county.

Clay County has begun to see increased commercial and residential development, due in part to the recreational opportunities provided by Chatuge Lake. Improvements to U.S. Highway 64 and NC 69 have also helped to increase commercial development activity by making the area more accessible to visitors. The county has obtained approval for a certified industrial park located near U.S. 64 and Town Mountain Road. The park should be attractive for industries, and the county is expected to see an increase in industrial growth in the near future as a result of the park's existence.

The population of Clay County is approximately 8,000 persons (July, 1997). The CCWSD currently provides potable water service to approximately 457 customers and sanitary sewer service to approximately 256 customers in the Town of Hayesville and surrounding areas.

SECTION II. EXECUTIVE SUMMARY

A. GENERAL

The Clay County Water and Sewer District recognizes that economic growth is imminent in the area and that the District's capability of providing water and sewer service must be expanded to serve this increasing population base. Moreover, in order to attract industrial and commercial development to the area, a strong infrastructure must be in place. Accordingly, the CCWSD has retained McGill Associates, P.A. of Asheville, North Carolina to prepare a Master Plan addressing the technical and financial aspects of rehabilitating and expanding the existing water and sewer systems.

B. WATER

Short-term goals:

This Master Plan recommends that the first priority of the CCWSD must be to provide a reliable water source for its water supply system and rehabilitate the existing network of pipes forming the water supply system.

This study concludes that to meet immediate needs for water in the system the two wells recently drilled on the TVA property should be equipped with water filtration systems adequate to allow these wells to be connected to the District's system. This project has been designed and permitted with construction pending. The connection of these wells will allow two existing wells (Orbit 2 and Old U.S. 64) to be retired. In addition, an existing private well, currently serving the River's Edge RV Park may be added to the District's system. The District has assumed ownership of these assets and its connection to the District's system is part of a program of improvements currently under construction.

In addition, this study recommends that the District replace approximately 12,000 linear feet of existing, asbestos cement pipe in the water distribution system. This type of pipe has proven to be a health threat and is no longer used. This type of pipe primarily exists in the downtown Hayesville area.

Other inadequacies previously identified are over 19,000 linear feet of smaller diameter, primarily galvanized pipes in the distribution system. These lines are more prone to leaks and are responsible for much of the unaccounted for water (38% in 1998) in the CCWSD water system. These lines tend to reduce the pressure, restrict the flow through, and fragment the distribution system. Therefore, replacing these lines would significantly improve fire protection capability and reduce the amount of unaccounted for water in the system. Both these and the abovementioned water distribution replacement projects are currently under construction. Included in this current construction project is a 12-inch water line along Highway 69 from U.S. 64 to Cherry Road. This water line will serve as a portion of the Towns County, Georgia water system interconnection discussed below.

Intermediate Goals:

The next step in the development of this system should be to provide adequate water storage facilities and a viable alternative to the existing groundwater supply sources. As with many groundwater-based systems, history has demonstrated that the yield of the wells serving this system has diminished over time. It is reasonable to assume that the yield of these new wells will ultimately also diminish. Therefore, this study recommends that an interconnection be constructed to join the water supply system from Towns County, Georgia with the CCWSD system. This will regionalize the water system and provide a source of supplementary water for the CCWSD system. It is also recommended that the CCWSD begin the process of acquiring sufficient property near Chatuge Lake on which to site a future surface water treatment facility.

This study also recommends that the District undertake the construction of a new 250,000-gallon water storage tank to be located approximately 1 mile east of Hayesville on a site the District has already acquired. In addition, the District's existing 150,000-gallon water storage tank should be replaced with a new 250,000-gallon standpipe, which would be constructed adjacent to the existing tank. The construction of these tanks at a somewhat higher elevation and the associated piping to connect these tanks to the existing system will allow the District to expand its service area by increasing the available water storage for the system and by boosting the pressure in the system.

Only at this stage should the CCWSD consider expansion of the existing water system. Initially, the CCWSD may consider a phased extension of an infrastructure water system along the U.S. 64 corridor east of Hayesville to the Mountain Harbor subdivision.

Long-term Goals:

During the second ten years of the study's 20-year planning period, the CCWSD will want to consider the construction of a permanent surface water treatment facility to provide a long-term reliable source of water for this system. This is recommended primarily to eliminate any potential future restrictions in water availability from the Towns County interconnection. The water source for this facility would be Chatuge Lake.

In addition, the CCWSD may consider additional expansions of the water supply system. The final stages of the U.S. 64 east extension to Mountain Harbor may be considered. Other potential service areas for these extensions may include the area west along U.S. 64 toward Sweetwater Gap, as well as extensions in the Myers Chapel Road and Qually Creek areas.

C. SEWER

Short-term Goals:

The first step in the implementation of this master plan is the construction of the improvements previously designed by McGill Associates, P.A. These projects focus on reducing inflow and infiltration (I/I) into the existing collection system by replacing approximately 17,300 linear feet of the existing collection system, replacing 15 additional existing manholes with significant I/I problems, and rehabilitating the existing Riverside Pump Station. Ultimately, the Riverside Pump Station would become a second influent pump station into the new wastewater treatment plant. Provisions have been made in the current design of this station to minimize the expense in upgrading this station later when this happens. These improvements have also been design and permitted and are currently under construction.

Intermediate Goals:

The next step in the development of this system should be to strive to eliminate as many existing pump stations as possible to reduce operation and maintenance costs. This can be accomplished through a series of gravity interceptor extensions beginning downstream (near the treatment plant) and progressing upstream. This process would begin with a gravity extension upstream along the Hiwassee River and Town Creek to the former wastewater treatment plant and the existing Town Creek Pump Station. This interceptor will allow the existing Town Creek Pump Station to be retired.

At this time, the first portion of a phased extension of sewer service along the U.S. 64 corridor east of Hayesville toward the Mountain Harbor subdivision may be considered.

In addition, a sewer system may be constructed in the vicinity of Highway 69 south of Hayesville to the Georgia State line. This system will provide sewer service to a corridor in which significant growth is anticipated.

Long-term Goals:

The extension of a gravity sewer interceptor system may continue along the Hiwassee River to the mouth of Blair Creek, then follow Blair Creek upstream to the fork of the creek. The sewer system would then follow the North Fork of Blair Creek to the existing Blair Creek pump stations. This gravity line would allow the two (2) existing pump stations along Blair Creek to be retired as well the Ingles Pump Station. Also, the final portion of the U.S. 64 corridor east of Hayesville to Mountain Harbor subdivision may be considered, as well as a gravity sewer extension along U.S. 64 west toward Sweetwater Gap.

In addition, sewer systems may be considered along Myers Chapel Road and along Qually Creek. The Myers Chapel Road extension will connected to the previously discussed Blair Creek/Hiwassee River interceptor, while the Qually Creek system may connect to the existing gravity sewer system upstream of the existing Industrial Park Pump Station.

Also within this planning period it may be necessary for the District to consider the expansion of its existing wastewater treatment plant. A logical expansion of this plant would be to double the capacity of the plant to 600,000 gallons per day.

The report that follows further details and prioritizes these recommendations, while also providing cost estimates for these improvements. The intent of this report is that it will be used as a long-term, planning tool for CCWSD officials.

SECTION III. EXISTING FACILITIES

A. WATER SYSTEM

WATER SOURCES

At present, the CCWSD relies on four (4) groundwater wells for its water supply. These wells have served this water supply system since 1964. The current capacity of these existing wells is shown in Table III-1 below.

TABLE III-1
EXISTING WATER SUPPLY WELLS
CLAY COUNTY WATER AND SEWER DISTRICT

WELL	SAFE YIELD
Orbit#1	45 gpm
Orbit#2	10 gpm
Jarrett Road	40 gpm
Old 64	60 gpm
TOTAL	**155 gpm**

State standards require that water supply wells pump for a maximum of 12 hours per day. Therefore, the total capacity of the above wells yields a daily maximum total of approximately 111,600 gallons per day that can be supplied to the system.

WATER DEMAND

Based on current water billing records, the current average water system demand on these wells is shown in Table III-2 below.

TABLE III-2

1998 AVERAGE WATER DEMANDS

CLAY COUNTY WATER AND SEWER DISTRICT

USE	AVERAGE DEMAND (MGD)
Residential	0.052
Commercial	0.029
Industrial	0.002
Institutional	0.014
Unaccounted	0.062
TOTAL	**0.159**

This average demand indicates a total daily demand of approximately 159,000 gallons per day. When this demand is compared to the available water supply, previously indicated, it is clear that the current water supply system cannot legally meet its current demands. As indicated previously, State regulations require that a system's wells be able to meet the average daily demand in twelve (12) hours of pumping. Currently, the existing wells must be pumped for 17 or more hours daily to provide enough water for the system. In addition, the well designated as Old US 64 well has, in the past, failed to meet water quality standards due to high pH and manganese levels and needs to be retired. Therefore, the CCWSD is currently under a moratorium prohibiting expansion of the water system due to the lack of a reliable source(s) of water capable of meeting the system's current demands. For this reason, and based on recommendations in the 1995 report "Preliminary Engineering Report, Water and Sewer Improvements, Clay County Water and Sewer District, Clay County, North Carolina," dated March, 1995, by McGill Associates, P.A., the CCWSD has drilled additional deep wells to provide water for current and future demand. In February of 1997, two deep wells were drilled on Tennessee Valley Authority (TVA) property located southeast of Hayesville near the Hiwassee River. Based on 24-hour pumping tests, the safe yield of these wells is 325 and 225 gpm (234,000 and 162,000 GPD, respectively, based on twelve (12) hours of pumping per day).

Tests on these wells have indicated iron concentrations exceeding safe drinking water levels in both of the wells. Iron concentrations in excess of 2 mg/L have been consistently measured in water from each well. Current water quality standards require treatment if iron concentrations exceed 0.3 mg/L. Presently, a treatment system for these wells has been designed and permitted with the construction of these improvements pending.

The CCWSD has also evaluated the possibility of connecting an existing private well used to supply water for the River's Edge Recreational Vehicle Park to the water system. This well is located east of the Hiwassee River just off of U.S. 64, and has a capacity of approximately 25 gpm. Currently, the system does not provide water east of the Hiwassee River along U.S. 64. However, the improvements to connect this well are part of the distribution system replacement project discussed below and are currently under construction.

DISTRIBUTION SYSTEM

The CCWSD water distribution system consists of approximately 13 miles of larger mains and smaller service laterals, ranging from ¾-inch to 8-inch in size. Many of the outlying areas of the system can be characterized as somewhat fragmented. The central downtown Hayesville area, although fairly well looped, consists of a number of older pipes that do not perform well. The CCWSD water system has approximately 12,000 linear feet of asbestos cement water lines, located primarily in the downtown Hayesville area, which present a health risk to the community. The rehabilitation of these portions of the system are currently under construction and are discussed in more detail below.

The CCWSD presently uses one (1) concrete storage tank with a capacity of 150,000 gallons. This tank was constructed in 1964. Another older tank with a capacity of 50,000 gallons is located next to the 150,000-gallon tank, but has been abandoned because the North Carolina

Department of Environment and Natural Resources has required that a fabricated steel cover and membrane liner be installed.

SEWER SYSTEM

COLLECTION SYSTEM

The existing wastewater collection system of the CCWSD consists approximately 8 miles of various size gravity sewer lines from 6-inch diameter to 8-inch diameter, in combination with lift stations and force mains that are required to serve the mountainous terrain of the area. Currently, the CCWSD operates six (6) lift stations. The earliest portions of the gravity sewer system were constructed in the 1940's. As is the case with collection systems of this era, many of the lines are constructed of terra cotta pipe. These older lines are the most sensitive to infiltration/inflow (I/I) due to leaking joints and broken and collapsed sections of pipe. To compound this problem, several areas have manholes constructed of dry stack masonry units on concrete slabs. These manholes are certainly prone to excessive I/I contributions. To address these issues, the CCWSD has recently commissioned McGill Associates to design a series of projects designed to address the primary sources of I/I in the system. These projects have recently been permitted and are currently under construction.

TREATMENT FACILITIES

The Town of Hayesville provided no significant treatment of wastewater until a central wastewater treatment plant was constructed in the 1960's along Town Creek. This plant was operated by the Town of Hayesville and later, the Clay County Sewer and Water District. It used an extended aeration process for treatment to secondary standards with discharge to Town Creek. The capacity of this plant was 97,000 gallons per day, which was regularly exceeded due to excessive infiltration/inflow (I/I) in the collection system. This wastewater treatment plant was recently converted to a pump station and replaced with a new 300,000

gallon per day extended aeration plant located just east of Hayesville on the larger Hiwassee River.

The CCWSD had been under a moratorium prohibiting sewer connections since November, 1994. The moratorium was imposed due to continual discharge permit violations at the District's Town Creek wastewater treatment plant. The violations were largely a result of flows to the treatment plant regularly exceeding the permitted maximum flow. However, since completing the construction of the new treatment plant the moratorium has been lifted.

SECTION IV. PROJECTED SYSTEM DEMANDS

A. EXISTING CUSTOMER BASE

Currently, the CCWSD has 483 active customers. The type of service provided to these customers is indicated in Table IV-1 below.

TABLE IV-1
WATER AND SEWER CUSTOMERS
CLAY COUNTY WATER AND SEWER DISTRICT

TYPE OF SERVICE PROVIDED	NUMBER OF CUSTOMERS
WATER ONLY	206
SEWER ONLY	5
WATER AND SEWER	251
SHUT OFF ACCOUNTS	21
TOTAL NUMBER OF WATER CUSTOMERS	457
TOTAL NUMBER OF SEWER CUSTOMERS	256
TOTAL NUMBER OF CUSTOMERS	**483**

With an average occupancy of 2.5 residents per service connection, the water system currently serves approximately 1,142 persons. Using the same multiplier, the sewer system currently serves approximately 640 persons.

B. DESIGN POPULATION

The most current U.S. census figures indicate that the population of Clay County has grown at an average annual rate of approximately one percent. However, with the recent lifting of the sewer moratorium and the future lifting of the water moratorium, Clay

County appears to be on the verge of considerable growth due to the increased tourist trade and recreational opportunities in the area. Recognizing the tremendous growth that has occurred in neighboring Towns County, Georgia in recent years, Clay County will likely experience similar growth in the next 20 years. Therefore, for the purposes of this report, an annual growth rate of two percent is assumed. The population projections for Clay County are shown in Table IV-2 below.

TABLE IV-2

CLAY COUNTY POPULATION PROJECTIONS

YEAR	PROJECTED POPULATION
2000	8,500
2005	9,400
2010	10,300
2015	11,400
2020	12,600

Projecting a similar rate of growth to the current customer base of the CCWSD yields the results shown in Table IV-3 below.

TABLE IV-3

CLAY COUNTY WATER AND SEWER DISTRICT

PROJECTED CUSTOMER BASE

YEAR	WATER CUSTOMERS	SEWER CUSTOMERS
2000	466	261
2005	515	288
2010	568	318
2015	627	351
2020	693	388

C. WATER DEMANDS

Table IV-4 presents average daily, maximum daily and peak hourly water demands which can be expected on the system over the 20-year planning period of this report.

TABLE IV-4
PROJECTED WATER SYSTEM DEMANDS
CLAY COUNTY WATER AND SEWER DISTRICT

YEAR	AVERAGE DAILY DEMAND (GPD)	MAXIMUM DAILY DEMAND (GPD)*	PEAK HOURLY DEMAND (GPD)**
2000	162,200	243,300	405,500
2005	179,100	268,700	447,800
2010	197,700	296,600	494,300
2015	218,300	327,500	545,800
2020	241,000	361,500	602,500

* Maximum Daily Demand is equal to 1.5 times the Average Daily Demand.

** Peak Hourly Demand is equal to 2.5 times the Average Daily Demand.

D. WASTEWATER FLOWS

Table IV-5 presents average daily and peak hourly wastewater flows that can be expected within the system over the 20-year planning period of this report.

TABLE IV-5

PROJECTED WASTEWATER SYSTEM FLOWS

CLAY COUNTY WATER AND SEWER DISTRICT

YEAR	AVERAGE DAILY FLOW (GPD)	MAXIMUM DAILY DEMAND (GPD)*
2000	71,400	142,800
2005	78,800	157,600
2010	87,000	174,000
2015	96,100	192,200
2020	106,100	212,200

* Maximum Daily Flow is equal to 2 times the Average Daily Flow.

SECTION V. CRITICAL NEEDS

A. WATER SYSTEM

There is an obvious, immediate and critical need for the CCWSD to obtain an additional source(s) for water. At present, the existing wells in the system are inadequate. The combined safe yield of these wells (111,600 gallons per day) is less than current demand (159,000 gallons per day), and thus, obviously will not be capable of providing enough water to serve future demands.

Compounding the already critical problem is the need to retire the well designated as Old US 64 due to the well's failure to meet water quality standards. The Old US 64 well has exceeded the limits for pH and manganese in the past. The well designated as Orbit #2 should also be abandoned in the near future due to low yield. Therefore, there is an immediate need for the CCWSD to obtain a reliable future source(s) for potable water.

The addition of the two (2) wells on TVA property along with the continued use of the existing Jarrett Road and Orbit #1 wells, should provide the CCWSD with a safe, reliable, short-term source of water.

Another area of concern for the CCWSD is the system's lack of storage capacity. State guidelines require at a minimum, twelve (12) hours of storage, based on the average daily demand, for community water systems. If the system is to provide fire protection, there should also be enough storage to maintain an adequate fire flow for at least two (2) hours. Clay County would like to provide fire protection to the industrial site located on U.S. 64 near Town Mountain Road. According to these guidelines, the CCWSD should maintain at a bare minimum, over 150,000 gallons of storage. As stated earlier the system has one storage tank with a capacity of 150,000 gallons. Thus, additional water storage is needed for the CCWSD water system.

At present, several areas in the CCWSD water distribution system are inadequate for various reasons. The most significant of these reasons is the public health threat caused by asbestos cement water lines in the system. The system has approximately12,000 linear feet of asbestos cement water lines in the immediate or nearby downtown Hayesville area. These lines pose a health threat and should, therefore, be replaced as soon as possible.

Other inadequacies in the system's distribution system include fragmented areas, older pipes, and undersized water lines that cannot provide adequate flow for fire protection. The system is also plagued with smaller diameter, primarily galvanized, water lines that contain leaks and are responsible for much of the unaccounted for water (38 percent in 1998) in the CCWSD water system. Replacing these lines would significantly improve fire protection for the system and reduce the amount of unaccounted for water in the system. To that end, McGill Associates has recently designed and permitted a group of rehabilitation improvements to correct these issues. These improvements consist of approximately 31,000 linear feet of water distribution system. These improvements are currently under construction.

B. SEWER SYSTEM

As discussed earlier, the CCWSD has recently completed construction of a new 300,000 gallon per day treatment facility on the Hiwassee River, put the facility on-line and retired the old wastewater treatment plant located on Town Creek. Doing so has lifted the moratorium that had previously been imposed on this system. However, inflow and infiltration (I/I) in the collection system continue to be a large contributor to high flows in the system during periods of inclement weather. These issues are being addressed through a series of projects recently designed and permitted by McGill Associates and are currently under construction. Included in these projects are approximately 17,300 linear feet of sewer system replacement and 15 manhole replacements. These projects are intended to preserve the capacity within the collection system and at the treatment facility in order to allow for demands created by future development in the area.

SECTION VI. WATER SYSTEM IMPROVEMENTS

The following is a prioritized list of water system improvements that are recommended for this system. Cost estimates for each of the following projects are included in Section IX of this report. Maps showing the existing water system as well as each of the recommended improvements are included in Section X of this report.

PRIORITY 1

WATER SOURCES

As stated earlier, the CCWSD is currently under a moratorium prohibiting expansion of the water system due to the lack of a reliable source(s) of water capable of meeting the system's current demands. The CCWSD has drilled two (2) additional wells, but has not been able to introduce water from the wells to the system without treatment for iron. Since the iron concentrations are greater than 1.0 mg/L, sequestering of the iron using polyphosphate is not a viable treatment option. The wells were videotaped to determine the zones rich in iron, and sleeves were installed in an attempt to prevent zones high in iron from contributing to the well supply. Results from testing after the sleeves were installed indicate that the sleeves will not effectively reduce the iron concentrations of the water. Therefore, a treatment system has been designed and permitted by McGill Associates that allows these wells to be connected to the CCWSD water distribution system. The construction of these improvements is pending. These wells will provide the CCWSD with a much needed, reliable source of water for the immediate future.

In addition to the two (2) TVA wells, the CCWSD would like to connect a private well at River's Edge Recreational Vehicle Park to their system. This well has been permitted and is capable of yielding 25 gpm. To that end, a portion of the water distribution improvements previously described is intended to make this connection to the CCWSD system. Involved in

these improvements will be a water line along U.S. 64 and across the Hiwassee River to connect this well with the existing system.

The addition of these three (3) new water sources for the system will increase the supply within the system an additional 575 gallons per minute. After abandoning the two existing wells, previously discussed, the overall water supply system could reach a total yield of approximately 660 gallons per minute or approximately 475,000 gallons per day.

However, as currently demonstrated within this and many other well-based water supply systems, the yield of these wells will likely diminish over time. This typically leads to the wells being retired (or at least the need for them to be retired). In addition, periods of drought will significantly affect the yield of the wells. Several extended dry periods during the 1980's convinced adjacent Towns County, Georgia to retire low yielding wells in favor of a new surface water supply, Chatuge Lake. While this dry period affected Clay County to a lesser degree, the CCWSD cannot depend on these groundwater sources that can fluctuate dramatically according to long-term weather patterns. Therefore, these wells should be viewed as a short-term measure in providing a reliable water source for this system.

DISTRIBUTION SYSTEM

The CCWSD system contains several asbestos cement water lines that should be replaced due to the health threat posed by asbestos. These lines are located in or near the downtown Hayesville area and are 6-inch lines. On S.R. 1300, S.R. 1315, and Anderson Street approximately 4,600, 2,700, and 800 linear feet, respectively, of 6-inch asbestos cement water line should be replaced with an 8-inch PVC water line. The increase in size of the lines will also help the system perform better with the proposed new tanks and wells. On S.R. 1356, Riverside Street, and Mill Street approximately 1,600, 1,600, and 700 linear feet, respectively, of 6-inch asbestos cement water line should be replaced with a 6-inch PVC

water line. The improvements associated with these areas of the distribution system have been designed and permitted and are currently under construction.

Several other areas contain water lines whose replacement is recommended for various reasons. On Town Mountain Road and Hiwassee Street, approximately 2,800 linear feet of 6-inch water line should be replaced with 8-inch water line. The increase in size will provide the flow necessary to provide the system with adequate fire protection. Also, replacement is recommended for approximately 1,000 linear feet of 6-inch water line at May Street that is approximately 20 feet deep in places. The excessive depth of the water line makes repair difficult. In addition, there is approximately 7,800 linear feet of smaller diameter, primarily galvanized, water lines at various locations in the system that need to be replaced primarily because of leaks and low system pressures. Approximately 2,100 linear feet of these small diameter water lines should be replaced with 6-inch water line to provide better flow and pressure. Approximately 3,300 linear feet of small diameter line is proposed to be replaced with 4-inch water line, and approximately 2,400 linear feet of smaller diameter line will be replaced with 2-inch water line. These improvements have also been designed and permitted and are also currently under construction.

Approximately 5,200 linear feet of 8-inch water line is necessary to connect the existing TVA wells to the distribution system. This water line will extend from the well treatment system on Myers Chapel Road and tie into an existing 8-inch water line located on U.S. 64. Approximately 5,700 linear feet of 2-inch sanitary sewer force main is also necessary to connect the backwash from the proposed water treatment system to the existing CCWSD wastewater system. These improvements have also been designed and recently permitted and are pending construction.

To connect the River's Edge Recreational Vehicle Park well to the distribution system, an 8-inch water line would be needed from the well to the water line proposed to connect the TVA wells to the system. This water line would be approximately 1,000 linear feet, and would

need to cross the Hiwassee River. This water line is proposed to cross the Hiwassee River via a sub-aqueous crossing. This connection is a portion of the improvements discussed above that have been designed and permitted and are currently under construction.

PRIORITY 2

STORAGE CAPACITY

Another goal of the CCWSD should be to increase the storage capacity of the water system. The CCWSD has located an acceptable site approximately one mile east of the Town of Hayesville for a new storage tank and has acquired rights to this site. A 250,000-gallon concrete ground storage tank is proposed at this site. The proposed overflow of this tank is at an elevation of approximately 2,060 feet mean sea level (MSL). The addition of this tank would allow the CCWSD to serve an elevation of approximately 1,990 feet MSL and lower with a minimum static pressure of approximately 30 psi.

The overflow of the existing 150,000-gallon tank is at an elevation of approximately 2,030 feet MSL. To work with the proposed system, the existing tank, which will currently serve an elevation of approximately 1,960 feet MSL will need to be replaced. A 250,000-gallon metal standpipe at the same overflow elevation as the proposed 250,000 gallon concrete tank is proposed.

The addition of the two (2) proposed storage tanks would provide the system with adequate storage for the foreseeable future.

WATER SOURCES

As an intermediate measure, and in an effort to regionalize this system, the CCWSD should consider an interconnection of their water system with that of Towns County, Georgia. The

interconnection with the Towns County, Georgia water system would include a 12-inch water system extending south along NC Highway 69 and GA Highway 17, from U.S. Highway 64 to U.S. Highway 76 in Georgia. This work would also provide water service to the currently developing NC 69 corridor south of Hayesville. This work and its associated costs have been previously presented in a Preliminary Engineering Report entitled, "Improvements to Facilitate Water System Interconnection with Towns County (Georgia) Water and Sewer Authority, Clay County Water and Sewer District, Clay County, North Carolina," dated September, 1999, authored by McGill Associates, P.A. Construction of these facilities would provide the CCWSD with a reliable source of supplementary water for this system. Currently, an agreement has been negotiated regarding this interconnection and the supply of water to the CCWSD. However, growth (and a corresponding increase in demand) within Towns County may eventually lead to a reduction or elimination of the water supply available from this source for the CCWSD. Also, the CCWSD cannot expect to have control over future rate increases under this scenario. In addition, the possibility of a change in the political climate or the relationship between the municipalities involved in this agreement may lead to this interconnection no longer being a viable option as a water source for the CCWSD. Therefore, the CCWSD must implement a long-term plan for providing a reliable water source for this system. This long-term plan should include, during this phase, a detailed study of a surface water treatment facility and property acquisition for the construction of the facility.

DISTRIBUTION SYSTEM

An 8-inch water line (approximately 6,000 linear feet) is required to connect the proposed ground storage tank off of S.R. 1354 to the distribution system. This line will extend from the proposed tank site to an existing water line on S.R. 1354.

Phase 1 of a water system extension is recommended along the U.S. Highway 64 corridor east of Hayesville. This phase of the project would extend an 8-inch line approximately

12,500 linear feet from the existing system at the intersection of U.S. 64 and S.R. 1140, along U.S. 64 to Smackass Gap.

PRIORITY 3

WATER SOURCES

The source for this long-term plan for providing an adequate water supply for the District's water system is a 1.0 MGD surface water treatment facility. In a report entitled, "Water and Sewer Study, Town of Hayesville, North Carolina, Clay County, North Carolina," date May, 1991, authored by McGill Associates, P.A., it was viewed, at that time, that a water treatment plant should be constructed along Tusquitee Creek, north of Hayesville. However, given current and projected growth patterns and the location of existing and proposed infrastructure facilities, it is recommended that a different source be considered for the supply for this water system. This facility would be located on Chatuge Lake. This alternative was one of those investigated in the May, 1991 report with the cost of the two alternatives being very similar. However, given the anticipated development south and east of Hayesville, the Chatuge Lake site now seems a more flogical alternative.

DISTRIBUTION SYSTEM

Next, phase 2 of the previously discussed U.S. Highway 64 east extension may be considered. This project would continue the extension of an 8-inch water line along U.S. 64 east of Hayesville, from Smackass Gap approximately 11,000 linear feet to Mountain Harbor subdivision.

The CCWSD may also want to consider the extension of the existing 6-inch water system in the proximity of Wilde Ford, west of Hayesville, approximately 4,000 linear feet west along

U.S. 64 toward Sweetwater Gap. This distance is the practical limit of the service area (before adequate system pressure is lost).

PRIORITY 4

DISTRIBUTION SYSTEM

Toward the end of the 20-year planning period addressed in this report, the CCWSD may consider the replacement and extension of approximately 5,000 linear feet of small diameter water line along SR 1306 and Qually Creek Road (SR 1305). This extension would include approximately 11,000 linear feet of 6-inch water system.

In addition, a water line extension along Myers Chapel Road may be considered. This extension would consist of approximately 7,400 linear feet of 8-inch water system and complete a loop of the system from Highway 69 to U.S. Highway 64.

SECTION VII. SEWER SYSTEM IMPROVEMENTS

The following is a prioritized list of sewer system improvements that are recommended for this system. Cost estimates for each of the following projects are included in Section IX of this report. Maps showing the existing sewer system, as well as each of the recommended improvements are included in Section X of this report.

PRIORITY 1

COLLECTION SYSTEM REHABILITATION:

Despite the recent lifting of the moratorium on connections to this collection system, inflow and infiltration (I/I) continue to plague the system. Addressing these I/I issues should be the first priority related to this collection system. In order to address this problem a series of collection system improvements have recently been designed and permitted by McGill Associates, P.A. and are currently under construction. The primary focus of these improvements is those areas of the system previously identified as the primary sources of I/I. Specifically, the work associated with these contract documents includes the following:

- Approximately 800 linear feet of gravity sewer line and associated manholes are to be replaced along Mill Street.

- The replacement of approximately 2,760 linear feet of gravity sewer lines and associated manholes along Hiwassee Street.

- Replacement is also proposed for approximately 790 linear feet of gravity sewer system along Hickory and Fort Hembree Streets.

- Replacement of six (6) of the existing sewer manholes along Ritter Road, Highway 69 and State Route 1122.

- The construction of nine (9) new manholes over the existing sewer line along State Route 1140 along with the replacement of approximately 1,650 linear feet of the existing pipe.

- Approximately 5,775 linear feet of the main trunk line to the former Town Creek treatment plant.

- Approximately 3,340 and 725 linear feet of the existing gravity collection system are to be replaced in the Riverside Street and downtown Hayesville areas respectively.

- The existing Riverside Pump Station will also be replaced along with approximately 1,460 linear feet of sewer force main in the Riverside Street area.

All of these proposed improvements are based on the recommendations contained in the "Preliminary Engineering Report and Environmental Assessment, Wastewater Collection System Improvements, Clay County Water and Sewer District, Clay County, North Carolina," dated March, 1999, authored by McGill Associates, P.A.

PRIORITY 2

COLLECTION SYSTEM EXTENSIONS

In addition to the rehabilitation projects discussed above, several extensions are necessary to increase the system service area and/or eliminate the need for the existing pump stations. These projects include the following:

An extension of a gravity sewer system (Town Creek Outfall) from the existing Riverside Pump Station along the Hiwassee River and Town Creek to the existing Town Creek Pump Station is recommended. This gravity system would consist of approximately 4,500 linear feet of gravity sewer system, would enable the retirement of the Town Creek Pump Station and provide sewer service to the adjacent area. As this and other extensions are constructed, the Riverside Pump Station would be converted to a second influent pump station for the existing wastewater treatment plant. The pumps and other components salvaged from the retirement of the Town Creek Pump station may be capable for use in the conversion of the Riverside Pump Station. The reuse of these salvaged components could greatly reduce the cost of this conversion.

This report further recommends the construction of a sewer collection system along Highway 69 south of Hayesville to the State line. This system will provide sewer service to an anticipated growth corridor. This project will consist of approximately 21,500 linear feet of 8-inch gravity sewer system, two (2) wastewater pump stations, and approximately 7,700 linear feet of 4-inch sewer force main.

Phase 1 of a sewer system extension is also recommended along the U.S. Highway 64 corridor east of Hayesville. This phase of the project would extend a gravity sewer system approximately 12,500 linear feet from the proposed Hiwassee River Interceptor at the intersection of U.S. 64 and S.R. 1140, along U.S. 64 to Smackass Gap.

PRIORITY 3

COLLECTION SYSTEM EXTENSIONS

An extension of a gravity sewer system (Hiwassee River Interceptor) along the Hiwassee River from the Town Creek Outfall line to the Ingles Pump Station, located on U.S. highway 64 may next be considered. This extension would allow the retirement of the Ingles Pump

Station and further expand the sewer service area. In conjunction with this extension, an extension of a gravity sewer system (Blair Creek Interceptor) is recommended along the Hiwassee River to the mouth of Blair Creek, then following Blair Creek upstream to the fork of the creek. The sewer system would then follow the North Fork of Blair Creek to the existing Blair Creek Pump Station. The installation of these systems would consist of approximate 21,000 linear feet of gravity sewer system, allow the retirement of three (3) existing pump stations and provide sewer service to existing and future development in this area south of the Town of Hayesville.

In addition, the CCWSD may consider the extension of sewer service west along U.S. 64 from the end of the existing system (near Wilde Ford) toward Sweetwater Gap. This extension would consist of approximately 5,000 linear feet of gravity sewer extension and serve this currently developing area.

Also, phase 2 of the previously discussed U.S. Highway 64 east extension may be considered. This project would continue the extension of sewer system along U.S. 64 east of Hayesville, from Smackass Gap approximately 11,000 linear feet to Mountain Harbor subdivision. In addition to approximately 10,000 linear feet of gravity sewer system, it is estimated that as many as three (3) sewer pump stations and 10,000 linear feet of sewer force main would be required to properly serve this area.

PRIORITY 4

COLLECTION SYSTEM EXTENSIONS

A gravity sewer extension may be considered along Qually Creek to Carroll Gap. This extension would consist of approximately 12,500 linear feet of gravity sewer system and serve this area of residential growth. In addition, a gravity sewer extension may also be considered along Myers Chapel Road. This extension would consist of approximately

19,000 linear feet of gravity sewer system, a wastewater pump station, and approximately 2,000 linear feet of sewer force main and similarly, serve this area of anticipated growth.

WASTEWATER TREATMENT SYSTEM

Based on the anticipated flows into the existing wastewater treatment plant, it may be necessary to increase the capacity of the treatment plant by the end of the 20-year planning period associated with this report. Due to the modular design of the existing plant, adding additional, but separate, treatment facilities immediately beside the existing facilities may best accomplish this. It is recommended that at that time, the capacity of the plant be doubled, from 300,000 GPD to 600,000 GPD. The current monetary value of this expansion is estimated at $1,200,000.00 based on the bids received for the recent construction on the existing wastewater treatment facility.

SECTION VIII SUMMARY OF PRIORITIES

The projects associated with and recommended by the report can be summarized into four (4) specific priorities. Tables VIII-1 presents a summary of these priorities.

TABLE VIII-1

SUMMARY OF PRIORITIES

PRIORITY	TYPE OF IMPROVEMENTS	PROJECT DESCRIPTION
PRIORITY 1:	WATER	TVA Wells – Treatment & Connection River's Edge RV Park Well - Connection System Replacements / Rehabilitation
	SEWER	System Replacements / Rehabilitation
PRIORITY 2:	WATER	Storage Capacity Towns County, GA Interconnection Phase 1 – U.S. 64 East Corridor Extension Surface Water Treatment Site Acquisition
	SEWER	Town Creek Outfall Line Highway 69 South Corridor Extension Phase 1 – U.S. 64 East Corridor Extension
PRIORITY 3:	WATER	Surface Water Treatment Facility Phase 2 – U.S. 64 East Corridor Extension U.S. 64 West Corridor Extension
	SEWER	Blair Creek / Hiwassee River Interceptor U.S. 64 West Corridor Extension Phase 2 – U.S. 64 East Corridor Extension
PRIORITY 4:	WATER	Qually Creek Extension Myers Chapel Road Extension
	SEWER	Qually Creek Extension Myers Chapel Road Extension Wastewater Treatment Plant Upgrades

SECTION IX PROJECT COST ESTIMATES

The following section reflects estimated costs for the improvements recommended in this report.

CLAY COUNTY WATER & SEWER DISTRICT
TVA WELLS - WATER TREATMENT SYSTEM & CONNECTION TO SYSTEM
COST ESTIMATE
WATER SYSTEM - PRIORITY 1 - WATER SOURCES

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	TREATMENT BUILDING	LS	1	$60,000	$60,000.00
2	IRON TREATMENT SYSTEM (FILTERS & CHEMICAL FEED)	LS	1	$95,000	$95,000.00
3	BACKWASH PUMPING SYSTEM	LS	1	$28,000	$28,000.00
4	TREATMENT PLANT PIPING & VALVES	LS	1	$60,000	$60,000.00
5	ELECTRICAL & CONTROLS	LS	1	$55,000	$55,000.00
6	SITE WORK (TREATMENT PLANT & STORAGE FACILITIES)	LS	1	$50,000	$50,000.00
7	LABORATORY & MONITORING EQUIPMENT	LS	1	$14,000	$14,000.00
8	STANDBY POWER GENERATOR	LS	1	$75,000	$75,000.00
9	WELL HEAD COVERS	LS	1	$4,500	$4,500.00
10	WELL SLEEVE REMOVAL	LS	1	$6,500	$6,500.00
11	8" W.L. - MYERS CHAPEL RD. (CONNECT TO SYSTEM)	LF	5,200	$30	$156,000.00
12	2" F.M. - MYERS CHAPEL RD. (BACKWASH EFFLUENT)	LF	5,700	$15	$85,500.00
13	UPGRADE EXISTING INGLES PUMP STATION	LS	1	$150,000	$150,000.00
	SUBTOTAL				$839,500.00
	Contingencies (10%)				$83,950.00
	Design Engineering				$61,800.00
	Construction Administration				$31,000.00
	TOTAL ESTIMATED COST				$1,016,250.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
RIVER'S EDGE RV PARK WELL - CONNECTION TO SYSTEM
COST ESTIMATE
WATER SYSTEM - PRIORITY 1 - WATER SOURCES

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" W.L. - U.S. 64 (CONNECT TO SYSTEM)	LF	1,000	$75	$75,000.00
2	REPLACE EXISTING WELL PUMP	LS	1	$7,500	$7,500.00
	SUBTOTAL				$82,500.00
	Contingencies (10%)				$8,250.00
	Design Engineering				$8,500.00
	Construction Administration				$5,800.00
	TOTAL ESTIMATED COST				$105,050.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
WATER SYSTEM REPLACEMENTS / REHABILITATION PROJECTS
COST ESTIMATE
WATER SYSTEM - PRIORITY 1 - DISTRIBUTION SYSTEM

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8: W.L. - S.R. 1300	LF	4,600	$25	$115,000.00
2	8" W.L. - S.R. 1315	LF	2,700	$25	$67,500.00
3	8" W.L. - TOWN MTN. RD. & HIWASSEE ST.	LF	2,800	$25	$70,000.00
4	8" W.L. - ANDERSON ST.	LF	800	$25	$20,000.00
5	6" W.L. - S.R. 1356	LF	1,600	$25	$40,000.00
6	6" W.L. - RIVERSIDE ST.	LF	1,600	$25	$40,000.00
7	6" W.L. - MAY ST.	LF	1,000	$25	$25,000.00
8	6" W.L. - HICKS RD.	LF	2,100	$25	$52,500.00
9	6" W.L. - MILL ST.	LF	700	$25	$17,500.00
10	4" W.L. - U.S. 64 BUSINESS	LF	1,800	$23	$41,400.00
11	4" W.L. - S.R. 1121	LF	500	$23	$11,500.00
12	4" W.L. - N.C.69 NORTH OF U.S. 64	LF	1,000	$23	$23,000.00
13	2" W.L. - ARLINGTON STREET	LF	1,000	$15	$15,000.00
14	2" W.L. - DAVIS LOOP	LF	800	$15	$12,000.00
15	2" W.L. - LEE ST.	LF	500	$15	$7,500.00
	SUBTOTAL				**$557,900.00**
	Contingencies (10%)				$55,790.00
	Design Engineering				$44,000.00
	Construction Administration				$22,800.00
	TOTAL ESTIMATED COST				**$680,490.00**

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
SEWER SYSTEM REPLACEMENTS / REHABILITATION PROJECTS
COST ESTIMATE
SEWER SYSTEM - PRIORITY 1 - COLLECTION SYSTEM REHABILITATION

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
	TOWN CREEK INTERCEPTOR REPLACEMENT				
1	8" GRAVITY SEWER LINE	LF	5,140	$40	$205,600.00
2	MANHOLE REPLACEMENT	EA	23	$1,900	$43,700.00
3	16" STEEL ENCASEMENT PIPE	LF	100	$120	$12,000.00
4	ASPHALT REPAIR	LF	1,800	$35	$63,000.00
5	4" SANITARY SEWER SERVICE	EA	4	$500	$2,000.00
	ADDITIONAL REHABILITATION WORK				
6	8" GRAVITY SEWER LINE	LF	9,340	$40	$373,600.00
7	MANHOLE REPLACEMENT	EA	38	$1,900	$72,200.00
8	ASPHALT REPAIR	LF	6,225	$35	$217,875.00
9	PUMP STATION REPLACEMENT	LS	1	$60,000	$60,000.00
10	MOBILIZATION (3%)	LS	1	$31,499	$31,499.00
	SUBTOTAL				**$1,081,474.00**
	Contingencies (10%)				$108,150.00
	Design Engineering				$77,500.00
	Construction Administration				$54,000.00
	Legal/Administrative				$10,000.00
	Easement Acquisition				$2,000.00
	TOTAL PROJECT COST				**$1,333,124.00**

CLAY COUNTY WATER & SEWER DISTRICT
WATER STORAGE TANKS
COST ESTIMATE
WATER SYSTEM - PRIORITY 2 - STORAGE CAPACITY

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	250,000 GALLON GROUND STORAGE TANK (US 64)	LS	1	$275,000	$275,000.00
2	8" W.L. - S.R. 1354 (CONNECTION TO SYSTEM)	LF	6,000	$25	$150,000.00
3	250,000 GALLON WATER STAND PIPE (TOWN MTN. RD.)	LS	1	$275,000	$275,000.00
	SUBTOTAL				$700,000.00
	Contingencies (10%)				$70,000.00
	Design Engineering				$53,200.00
	Construction Administration				$27,000.00
	TOTAL ESTIMATED COST				$850,200.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
WATER SYSTEM INTERCONNECTION WITH TOWNS COUNTY, GEORGIA
COST ESTIMATE
WATER SYSTEM - PRIORITY 2 - WATER SOURCES

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	500,000 GALLON WATER STORAGE TANK	LS	1	$400,000	$400,000.00
2	LAND (TANK & BOOSTER STATION)	LS	1	$20,000	$20,000.00
3	STORAGE TANK ACCESS ROAD	LS	1	$35,000	$35,000.00
4	WATER BOOSTER PUMP STATION	LS	1	$200,000	$200,000.00
5	MASTER METER VAULT	LS	1	$10,000	$10,000.00
6	12" WATER LINE ON NC69 AND GA 17	LF	20,000	$33	$660,000.00
	SUBTOTAL				$1,325,000.00
	Contingencies (10%)				$132,500.00
	Legal/Administrative				$20,000.00
	Design Engineering				$93,200.00
	Construction Administration				$62,100.00
	TOTAL ESTIMATED COST				$1,632,800.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
WATER SYSTEM - SURFACE WATER TREATMENT SITE
COST ESTIMATE
WATER SYSTEM - PRIORITY 2 - WATER SOURCES

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	PROPERTY ACQUISITION	LS	1	$50,000	$50,000.00
2	PRELIMINARY ENGINEERING	LS	1	$15,000	$15,000.00
3	PLANNING	LS	1	$15,000	$15,000.00
	SUBTOTAL				$80,000.00
	Contingencies (10%)				$8,000.00
	TOTAL ESTIMATED COST				$88,000.00

CLAY COUNTY WATER & SEWER DISTRICT
WATER SYSTEM - PHASE 1, U.S. 64 EAST CORRIDOR EXTENSION
COST ESTIMATE
WATER SYSTEM - PRIORITY 2 - DISTRIBUTION SYSTEM

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" W.L. - U.S. 64 EAST TO SMACKASS GAP	LF	12,500	$20	$250,000.00
2	MISC. FITTINGS	LB	1,000	$2	$2,000.00
3	FIRE HYDRANT ASSEMBLY	EA	13	$1,600	$20,800.00
4	8" GATE VALVE & BOX	EA	13	$600	$7,800.00
5	CONNECT TO EXISTING WATER LINE	LS	1	$2,500	$2,500.00
6	BRIDGE CROSSING	EA	1	$15,000	$15,000.00
7	CREEK CROSSING	EA	2	$5,000	$10,000.00
8	BORE & JACK 18" STEEL ENCASEMENT PIPE	LF	100	$100	$10,000.00
	SUBTOTAL				$318,100.00
	Contingencies (10%)				$31,810.00
	Design Engineering				$27,500.00
	Construction Administration				$15,600.00
	TOTAL ESTIMATED COST				$393,010.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
SEWER SYSTEM - TOWN CREEK OUTFALL LINE
COST ESTIMATE
SEWER SYSTEM - PRIORITY 2 - COLLECTION SYSTEM EXTENSIONS

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" GRAVITY SEWER LINE	LF	4,500	$40	$180,000.00
2	4' DIA. PRECAST MANHOLE	EA	18	$1,900	$34,200.00
3	18" STEEL ENCASEMENT PIPE	LF	50	$120	$6,000.00
4	ROCK EXCAVATION	CY	200	$60	$12,000.00
5	SELECT BACKFILL MATERIAL	CY	200	$10	$2,000.00
6	WASHED STONE	TON	100	$25	$2,500.00
7	CONNECT TO EXISTING SEWER SYSTEM	EA	1	$1,500	$1,500.00
8	UPGRADE EXISTING RIVERSIDE PUMP STATION	LS	1	$50,000	$50,000.00
9	ABANDON EXISTING TOWN CREEK PUMP STATION	LS	1	$10,000	$10,000.00
	SUBTOTAL				$298,200.00
	Contingencies (10%)				$29,820.00
	Design Engineering				$27,900.00
	Construction Administration				$15,800.00
	TOTAL ESTIMATED COST				$371,720.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
SEWER SYSTEM - HIGHWAY 69 EXTENSION
(SOUTH TO STATE LINE)
COST ESTIMATE
SEWER SYSTEM - PRIORITY 2 - COLLECTION SYSTEM EXTENSIONS

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" GRAVITY SEWER LINE	LF	21,500	$40	$860,000.00
2	4' DIA. PRECAST MANHOLE	EA	86	$1,900	$163,400.00
3	SEWER PUMP STATION	EA	2	$100,000	$200,000.00
4	4" SEWER FORCE MAIN	LF	7,700	$20	$154,000.00
5	18" STEEL ENCASEMENT PIPE	LF	500	$120	$60,000.00
6	ROCK EXCAVATION	CY	1,000	$60	$60,000.00
7	SELECT BACKFILL MATERIAL	CY	1,000	$10	$10,000.00
8	WASHED STONE	TON	500	$25	$12,500.00
9	UPGRADE EXISTING PUMP STATION	LS	1	$50,000	$50,000.00
10	CONNECT TO EXISTING SEWER SYSTEM	EA	1	$1,500	$1,500.00
	SUBTOTAL				**$1,571,400.00**
	Contingencies (10%)				$157,140.00
	Design Engineering				$108,700.00
	Construction Administration				$56,700.00
	TOTAL ESTIMATED COST				**$1,893,940.00**

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT

SEWER SYSTEM - PHASE 1 - U.S. 64 EAST CORRIDOR EXTENSION

COST ESTIMATE

SEWER SYSTEM - PRIORITY 2 - COLLECTION SYSTEM EXTENSIONS

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" GRAVITY SEWER LINE	LF	12,500	$40	$500,000.00
2	4' DIA. PRECAST MANHOLE	EA	50	$1,900	$95,000.00
3	18" STEEL ENCASEMENT PIPE	LF	50	$120	$6,000.00
4	ROCK EXCAVATION	CY	600	$60	$36,000.00
5	SELECT BACKFILL MATERIAL	CY	600	$10	$6,000.00
6	WASHED STONE	TON	300	$25	$7,500.00
7	CONNECT TO EXISTING SEWER SYSTEM	EA	1	$1,500	$1,500.00
8	CREEK CROSSING	EA	2	$5,000	$10,000.00
9	RIVER CROSSING	EA	1	$25,000	$25,000.00
	SUBTOTAL				$687,000.00
	Contingencies (10%)				$68,700.00
	Design Engineering				$52,400.00
	Construction Administration				$26,300.00
	TOTAL ESTIMATED COST				$834,400.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
WATER SYSTEM - SURFACE WATER TREATMENT FACILITY
COST ESTIMATE
WATER SYSTEM - PRIORITY 3 - WATER SOURCES

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
	RAW WATER INTAKE				
1	EXCAVATION (ROCK)	CY	1,500	$70	$105,000.00
2	EXCAVATION (SOIL)	CY	2,500	$6	$15,000.00
3	DEWATERING	LS	1	$20,000	$20,000.00
4	CONCRETE	CY	650	$400	$260,000.00
5	BUILDING	SF	1,000	$80	$80,000.00
6	PUMPS	EA	2	$30,000	$60,000.00
7	INTAKE SCREENS	EA	3	$20,000	$60,000.00
8	SLUICE GATES	EA	3	$30,000	$90,000.00
9	ELECTRICAL	LS	1	$100,000	$100,000.00
10	RAW WATER LINE	LF	1,000	$45	$45,000.00
	TREATMENT FACILITY (1.0 MGD)				
11	OFF-LAKE STORAGE	LS	1	$200,000	$200,000.00
12	RAW WATER PUMP STATION	LS	1	$100,000	$100,000.00
13	1.0 MGD PACKAGED TREATMENT PLANT	LS	1	$325,000	$325,000.00
14	OFFICE/STORAGE BUILDING	LS	1	$150,000	$150,000.00
15	CHEMICAL FEED EQUIPMENT	LS	1	$130,000	$130,000.00
16	ELECTRICAL	LS	1	$400,000	$400,000.00
17	BACKWASH LAGOON	LS	1	$160,000	$160,000.00
18	YARD PIPING	LS	1	$200,000	$200,000.00
19	500,000 GALLON CLEARWELL	LS	1	$300,000	$300,000.00
20	FINISHED WATER PUMP STATION	LS	1	$150,000	$150,000.00
21	SITE WORK	LS	1	$100,000	$100,000.00
24	8" W.L. - MYERS CHAPEL RD. (CONNECT T	LF	6,800	$30	$204,000.00
	SUBTOTAL				**$3,254,000.00**
	Contingencies (10%)				$325,400.00
	Design Engineering				$206,600.00
	Construction Administration				$83,400.00
	TOTAL ESTIMATED COST				**$3,869,400.00**

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
WATER SYSTEM - PHASE 2, U.S. 64 EAST CORRIDOR EXTENSION
COST ESTIMATE
WATER SYSTEM - PRIORITY 3 - DISTRIBUTION SYSTEM

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" W.L. - SMACKASS GAP TO MOUNTAIN HARBOR SUBD.	LF	11,000	$20	$220,000.00
2	MISC. FITTINGS	LB	950	$2	$1,900.00
3	FIRE HYDRANT ASSEMBLY	EA	12	$1,600	$19,200.00
4	8" GATE VALVE & BOX	EA	12	$600	$7,200.00
5	CONNECT TO EXISTING WATER LINE	LS	1	$2,500	$2,500.00
6	CREEK/LAKE CROSSING	EA	4	$12,000	$48,000.00
	SUBTOTAL				$298,800.00
	Contingencies (10%)				$29,880.00
	Design Engineering				$26,000.00
	Construction Administration				$15,000.00
	TOTAL ESTIMATED COST				$369,680.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
WATER SYSTEM - U.S. 64 WEST CORRIDOR EXTENSION
COST ESTIMATE
WATER SYSTEM - PRIORITY 3 - DISTRIBUTION SYSTEM

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	6" W.L. - TOWARD SWEETWATER GAP	LF	4,000	$18	$72,000.00
2	MISC. FITTINGS	LB	500	$2	$1,000.00
3	FIRE HYDRANT ASSEMBLY	EA	5	$1,600	$8,000.00
4	6" GATE VALVE & BOX	EA	5	$500	$2,500.00
5	CONNECT TO EXISTING WATER LINE	LS	1	$2,500	$2,500.00
6	CREEK CROSSING	EA	2	$5,000	$10,000.00
	SUBTOTAL				$96,000.00
	Contingencies (10%)				$9,600.00
	Design Engineering				$9,900.00
	Construction Administration				$7,000.00
	TOTAL ESTIMATED COST				$122,500.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
SEWER SYSTEM - BLAIR CREEK / HIWASSEE RIVER INTERCEPTOR
COST ESTIMATE
SEWER SYSTEM - PRIORITY 3 - COLLECTION SYSTEM EXTENSIONS

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" GRAVITY SEWER LINE	LF	21,000	$40	$840,000.00
2	4' DIA. PRECAST MANHOLE	EA	85	$1,900	$161,500.00
3	18" STEEL ENCASEMENT PIPE	LF	300	$120	$36,000.00
4	ROCK EXCAVATION	CY	1,000	$60	$60,000.00
5	SELECT BACKFILL MATERIAL	CY	1,000	$10	$10,000.00
6	WASHED STONE	TON	500	$25	$12,500.00
7	CONNECT TO EXISTING SEWER SYSTEM	EA	1	$1,500	$1,500.00
8	CREEK CROSSING	LS	6	$7,500	$45,000.00
9	UPGRADE EXISTING RIVERSIDE PUMP STATION	LS	1	$75,000	$75,000.00
10	ABANDON EXISTING PUMP STATION	EA	2	$10,000	$20,000.00
	SUBTOTAL				$1,261,500.00
	Contingencies (10%)				$126,150.00
	Design Engineering				$89,200.00
	Construction Administration				$49,900.00
	TOTAL ESTIMATED COST				$1,526,750.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
SEWER SYSTEM - U.S. 64 WEST CORRIDOR EXTENSION
COST ESTIMATE
SEWER SYSTEM - PRIORITY 3 - COLLECTION SYSTEM EXTENSIONS

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" GRAVITY SEWER LINE	LF	5,000	$40	$200,000.00
2	4' DIA. PRECAST MANHOLE	EA	20	$1,900	$38,000.00
3	18" STEEL ENCASEMENT PIPE	LF	50	$120	$6,000.00
4	ROCK EXCAVATION	CY	250	$60	$15,000.00
5	SELECT BACKFILL MATERIAL	CY	250	$10	$2,500.00
6	WASHED STONE	TON	100	$25	$2,500.00
7	CONNECT TO EXISTING SEWER SYSTEM	EA	1	$1,500	$1,500.00
8	CREEK CROSSING	LS	1	$5,000	$5,000.00
	SUBTOTAL				$270,500.00
	Contingencies (10%)				$27,050.00
	Design Engineering				$24,000.00
	Construction Administration				$14,400.00
	TOTAL ESTIMATED COST				$335,950.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
SEWER SYSTEM - PHASE 2 - U.S. 64 EAST CORRIDOR EXTENSION
COST ESTIMATE
SEWER SYSTEM - PRIORITY 3 - COLLECTION SYSTEM EXTENSIONS

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" GRAVITY SEWER LINE	LF	10,000	$40	$400,000.00
2	4' DIA. PRECAST MANHOLE	EA	44	$1,900	$83,600.00
3	18" STEEL ENCASEMENT PIPE	LF	100	$120	$12,000.00
4	ROCK EXCAVATION	CY	550	$60	$33,000.00
5	SELECT BACKFILL MATERIAL	CY	550	$10	$5,500.00
6	WASHED STONE	TON	250	$25	$6,250.00
7	CONNECT TO EXISTING SEWER SYSTEM	EA	1	$1,500	$1,500.00
8	CREEK CROSSING	LS	5	$5,000	$25,000.00
9	SEWER PUMP STATION	EA	3	$100,000	$300,000.00
10	3" SEWER FORCE MAIN	LF	10,000	$18	$180,000.00
	SUBTOTAL				$1,046,850.00
	Contingencies (10%)				$104,690.00
	Design Engineering				$75,100.00
	Construction Administration				$35,200.00
	TOTAL ESTIMATED COST				$1,261,840.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
WATER SYSTEM - QUALLY CREEK ROAD EXTENSION
COST ESTIMATE
WATER SYSTEM - PRIORITY 4 - DISTRIBUTION SYSTEM

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	6" WATER LINE	LF	11,000	$18	$198,000.00
2	MISC. FITTINGS	LB	1,000	$2	$2,000.00
3	FIRE HYDRANT ASSEMBLY	EA	12	$1,600	$19,200.00
4	6" GATE VALVE & BOX	EA	12	$500	$6,000.00
5	CONNECT TO EXISTING WATER LINE	LS	1	$2,500	$2,500.00
6	CREEK CROSSING	EA	9	$7,500	$67,500.00
	SUBTOTAL				$295,200.00
	Contingencies (10%)				$29,520.00
	Design Engineering				$25,800.00
	Construction Administration				$14,900.00
	TOTAL ESTIMATED COST				$365,420.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
WATER SYSTEM - MYERS CHAPEL ROAD EXTENSION
(COMPLETE LOOP FROM HWY 69 TO SURFACE WATER TREATMENT FACILITY)
COST ESTIMATE
WATER SYSTEM - PRIORITY 4 - DISTRIBUTION SYSTEM

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" WATER LINE	LF	7,400	$20	$148,000.00
2	MISC. FITTINGS	LB	950	$2	$1,900.00
3	FIRE HYDRANT ASSEMBLY	EA	8	$1,600	$12,800.00
4	8" GATE VALVE & BOX	EA	8	$600	$4,800.00
5	CONNECT TO EXISTING WATER LINE	LS	1	$2,500	$2,500.00
6	BORE & JACK 18" STEEL ENCASEMENT PIPE	LF	200	$120	$24,000.00
	SUBTOTAL				$194,000.00
	Contingencies (10%)				$19,400.00
	Design Engineering				$18,200.00
	Construction Administration				$14,700.00
	TOTAL ESTIMATED COST				$246,300.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
SEWER SYSTEM - QUALLY CREEK EXTENSION
COST ESTIMATE
SEWER SYSTEM - PRIORITY 4 - COLLECTION SYSTEM EXTENSIONS

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" GRAVITY SEWER LINE	LF	12,500	$40	$500,000.00
2	4' DIA. PRECAST MANHOLE	EA	50	$1,900	$95,000.00
3	18" STEEL ENCASEMENT PIPE	LF	50	$120	$6,000.00
4	ROCK EXCAVATION	CY	600	$60	$36,000.00
5	SELECT BACKFILL MATERIAL	CY	600	$10	$6,000.00
6	WASHED STONE	TON	300	$25	$7,500.00
7	CONNECT TO EXISTING SEWER SYSTEM	EA	1	$1,500	$1,500.00
8	CREEK CROSSING	EA	9	$5,000	$45,000.00
9	RIVER CROSSING	LS	1	$25,000	$25,000.00
	SUBTOTAL				$722,000.00
	Contingencies (10%)				$72,200.00
	Design Engineering				$54,600.00
	Construction Administration				$27,300.00
	TOTAL ESTIMATED COST				$876,100.00

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CLAY COUNTY WATER & SEWER DISTRICT
SEWER SYSTEM - MYERS CHAPEL ROAD EXTENSION
COST ESTIMATE
SEWER SYSTEM - PRIORITY 4 - COLLECTION SYSTEM EXTENSIONS

	ITEM	UNITS	QUANTITY	UNIT PRICE	TOTAL COST
1	8" GRAVITY SEWER LINE	LF	19,000	$40	$760,000.00
2	4' DIA. PRECAST MANHOLE	EA	72	$1,900	$136,800.00
3	SEWER PUMP STATION	EA	1	$100,000	$100,000.00
4	4" SEWER FORCE MAIN	LF	2,000	$20	$40,000.00
5	18" STEEL ENCASEMENT PIPE	LF	300	$120	$36,000.00
6	ROCK EXCAVATION	CY	900	$60	$54,000.00
7	SELECT BACKFILL MATERIAL	CY	900	$10	$9,000.00
8	WASHED STONE	TON	450	$25	$11,250.00
9	CONNECT TO EXISTING SEWER SYSTEM	EA	2	$1,500	$3,000.00
	SUBTOTAL				**$1,150,050.00**
	Contingencies (10%)				$115,010.00
	Design Engineering				$81,900.00
	Construction Administration				$46,900.00
	TOTAL ESTIMATED COST				**$1,393,860.00**

NOTE: THE ESTIMATED COSTS SHOWN FOR THIS PROJECT DO NOT INCLUDE ANY EXPENSES ASSOCIATED WITH LEGAL/ADMINISTRATIVE FEES NOR EASEMENT ACQUISITION.

CAPITAL IMPROVEMENT PLAN

The following is a summary of the capital improvements recommended by this report for the Clay County Water and Sewer District. The District should use this Capital Improvement Plan as a planning tool to establish and modify rate structures and seek grants and loans as needed to fund these improvements. In this manner, the District can better define its strategic planning goals in terms of capital outlay requirements as these projects are implemented.

This report and associated Capital Improvement Plan outlines a course of action to improve the Clay County Water and Sewer District's systems over a twenty-year period. It is anticipated that over this period of time projects will be completed and needs and priorities may change. Therefore, we recommend that as these needs and priorities change, the Master Plan is reevaluated to ensure it is up to date with current cost projections and needs assessments.

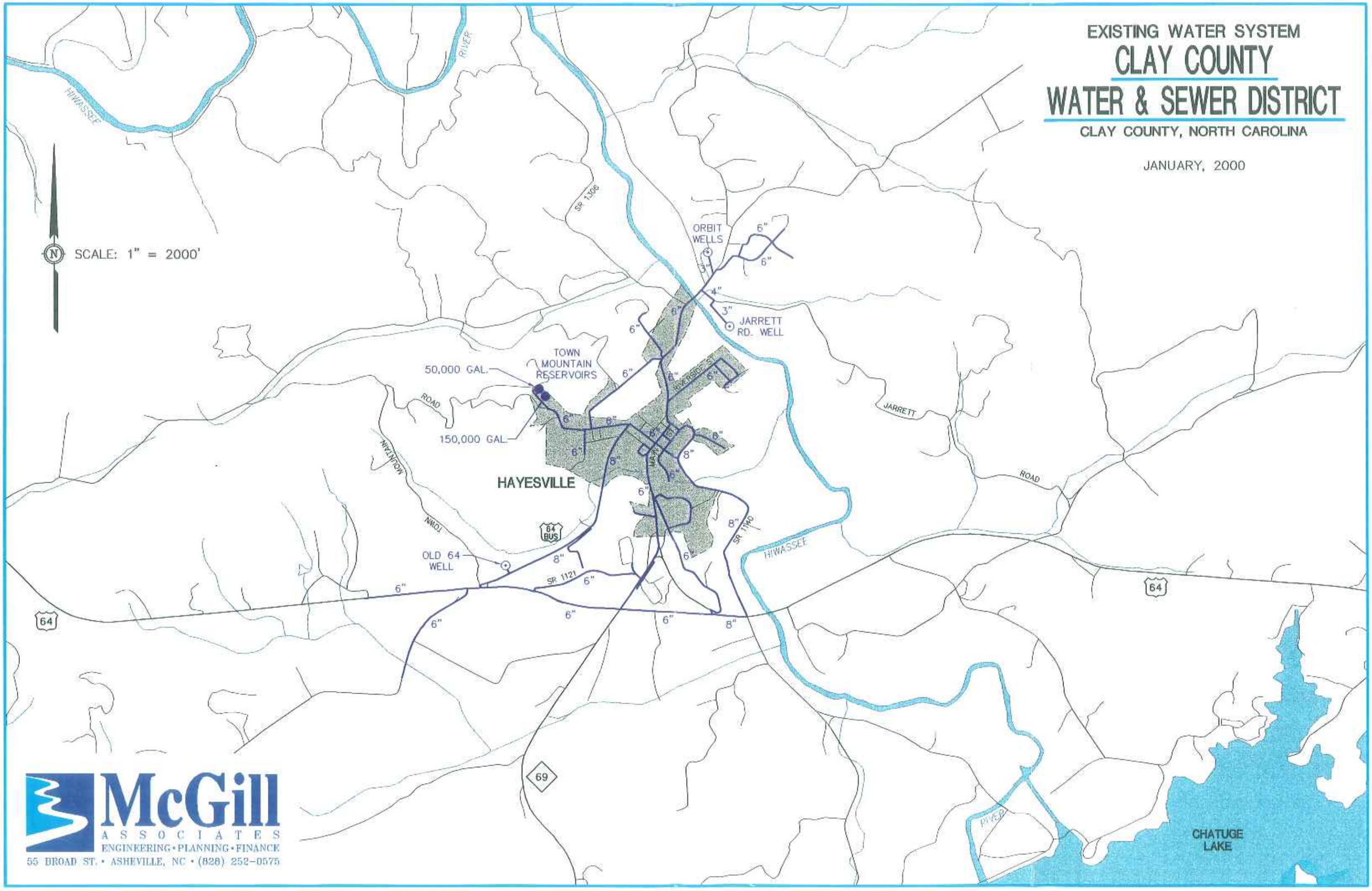
The following table highlights the recommended improvements and an anticipated timeline it may seem reasonable to construct these improvements. Due to the length of construction times and/or affordability you will note that some projects have been spread over two fiscal years. That is to say that a project may be begun during one fiscal year, but completed in the following fiscal year.

We anticipate that the completion of these projects will depend heavily on funding provided by grants and other sources beyond user fees. Therefore, the availability of these funds in the future will significantly affect the District's ability to complete the recommended projects in the timeframe described in this report.

CL ITY WA D SEWE ICT
CLAY COUNTY, NORTH CAROLINA
CAPITAL IMPROVEMENT PLAN
APRIL, 2001

	2000-2001	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012	2012-2013	2013-2014	2014-2015	2015-2016	2016-2017	2017-2018	2018-2019	2019-2020	TOTAL
PRIORITY 1 PROJECTS																					
TVA WELLS - WATER TREATMENT SYSTEM & CONNECTION		$1,016,250																			$1,016,250
RIVER'S EDGE RV PARK WELL CONNECTION TO SYSTEM		$105,050																			$105,050
WATER LINE REPLACEMENT / REHABILITATION PROJECTS		$680,490																			$680,490
SEWER SYSTEM REPLACEMENT / REHABILITATION PROJECTS	$1,333,124																				$1,333,124
SUBTOTAL - PRIORITY 1 PROJECTS																					$3,134,914
PRIORITY 2 PROJECTS																					
WATER STORAGE TANKS AND CONNECTION		$850,200																			$850,200
TOWN'S COUNTY WATER LINE INTERCONNECTION			$1,632,800																		$1,632,800
WATER - PHASE 1 - US 64 EAST CORRIDOR EXTENSION				$393,010																	$393,010
SURFACE WATER TREATMENT SITE ACQUISITION				$88,000																	$88,000
SEWER - TOWN CREEK OUTFALL LINE			$371,720																		$371,720
SEWER - HIGHWAY 69 EXTENSION					$946,970	$946,970															$1,893,940
SEWER - PHASE 1 - US 64 EAST CORRIDOR EXTENSION							$417,200	$417,200													$834,400
SUBTOTAL - PRIORITY 2 PROJECTS																					$6,064,070
PRIORITY 3 PROJECTS																					
SURFACE WATER TREATMENT FACILITY										$1,934,700	$1,934,700										$3,869,400
WATER - PHASE 2 - US 64 EAST CORRIDOR EXTENSION									$369,680												$369,680
WATER - US 64 WEST CORRIDOR EXTENSION									$122,500												$122,500
SEWER - BLAIR CRK./HIWASSEE RIVER INTERCEPTOR												$763,375	$763,375								$1,526,750
SEWER - US 64 WEST CORRIDOR EXTENSION													$335,950								$335,950
SEWER - PHASE 2 - US 64 EAST CORRIDOR EXTENSION														$630,920	$630,920						$1,261,840
SUBTOTAL - PRIORITY 3 PROJECTS																					$7,486,120
PRIORITY 4 PROJECTS																					
WATER - QUALLY CREEK ROAD EXTENSION																$365,420					$365,420
WATER - MYERS CHAPEL ROAD EXTENSION																$246,300					$246,300
SEWER - QUALLY CREEK EXTENSION																	$676,100				$676,100
SEWER - MYERS CHAPEL ROAD EXTENSION																		$1,393,860			$1,393,860
WASTEWATER TREATMENT PLANT UPGRADES																			$600,000	$600,000	$1,200,000
SUBTOTAL - PRIORITY 4 PROJECTS																					$4,081,680
OTHER EXPENSES																					
WASTEWATER TREATMENT PLANT EQUIPMENT			$30,000						$50,000							$50,000					$130,000
TOTAL	$1,333,124	$2,651,990	$2,034,520	$481,010	$946,970	$946,970	$417,200	$417,200	$542,180	$1,934,700	$1,934,700	$763,375	$1,099,325	$630,920	$630,920	$661,720	$676,100	$1,393,860	$600,000	$600,000	$20,896,784

PROJECT MAPS



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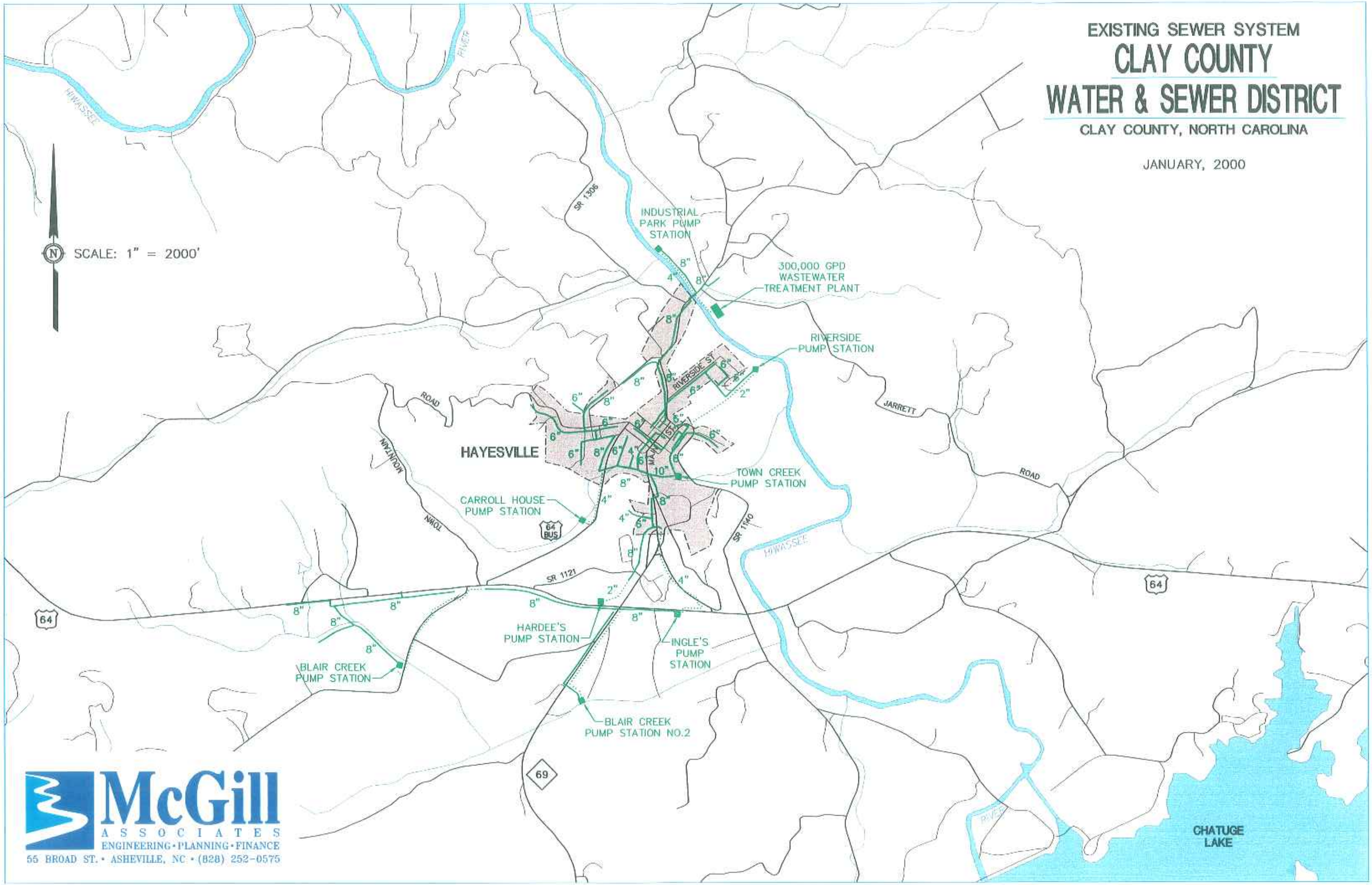
EXISTING SEWER SYSTEM
CLAY COUNTY
WATER & SEWER DISTRICT

CLAY COUNTY, NORTH CAROLINA

JANUARY, 2000



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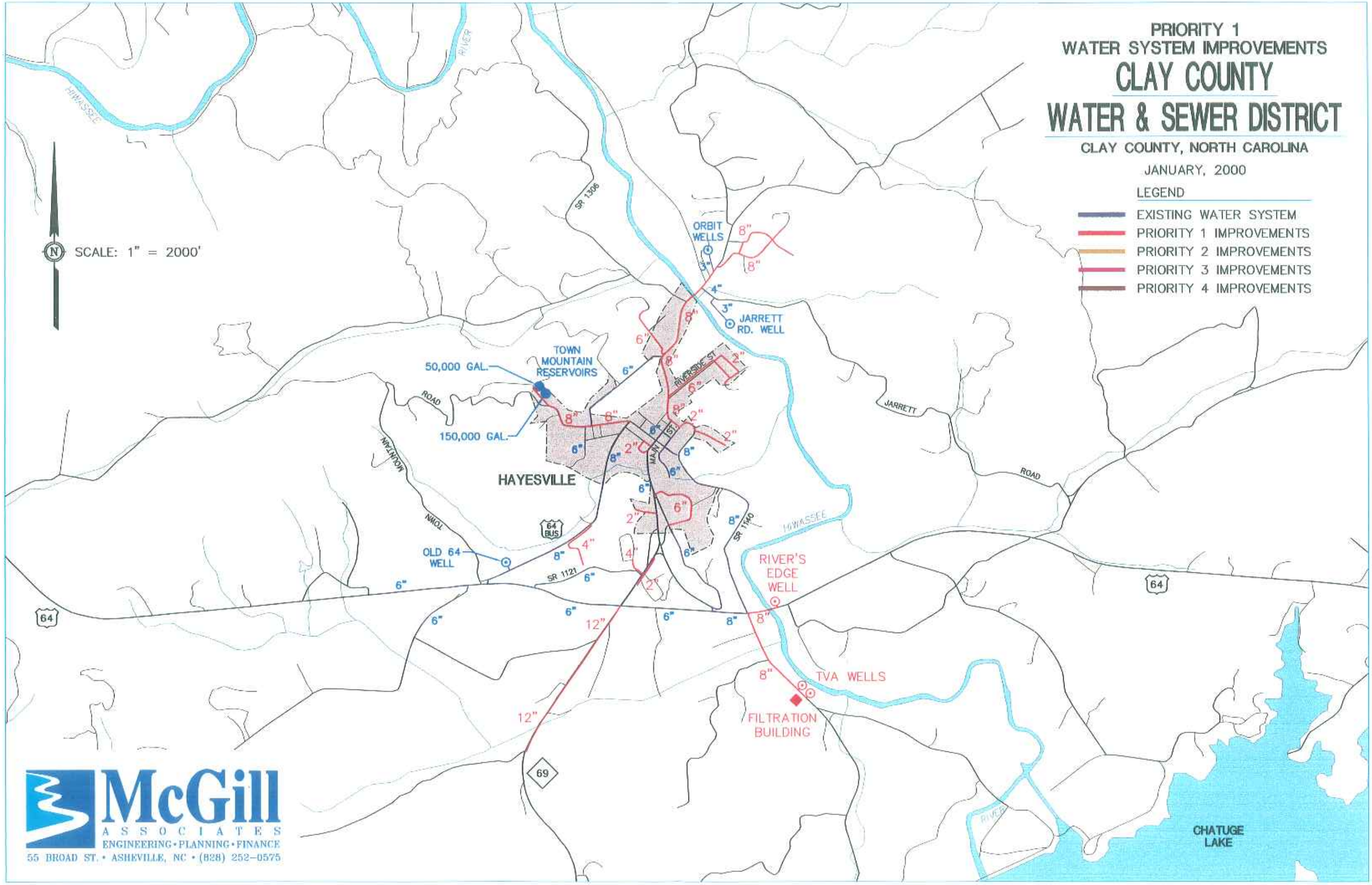
PRIORITY 1
WATER SYSTEM IMPROVEMENTS
CLAY COUNTY
WATER & SEWER DISTRICT
CLAY COUNTY, NORTH CAROLINA
JANUARY, 2000
LEGEND
EXISTING WATER SYSTEM
PRIORITY 1 IMPROVEMENTS
PRIORITY 2 IMPROVEMENTS
PRIORITY 3 IMPROVEMENTS
PRIORITY 4 IMPROVEMENTS
SCALE: 1" = 2000'
N
HIWASSEE
RIVER
SR 1306
ORBIT WELLS
JARRETT RD. WELL
TOWN MOUNTAIN RESERVOIRS
50,000 GAL.
150,000 GAL.
MOUNTAIN
TOWN
ROAD
JARRETT
ROAD
RIVERSIDE ST.
MAIN ST.
HAYESVILLE
64 BUS
OLD 64 WELL
SR 1121
SR 1140
RIVER'S EDGE WELL
TVA WELLS
FILTRATION BUILDING
64
69
CHATUGE LAKE
McGill
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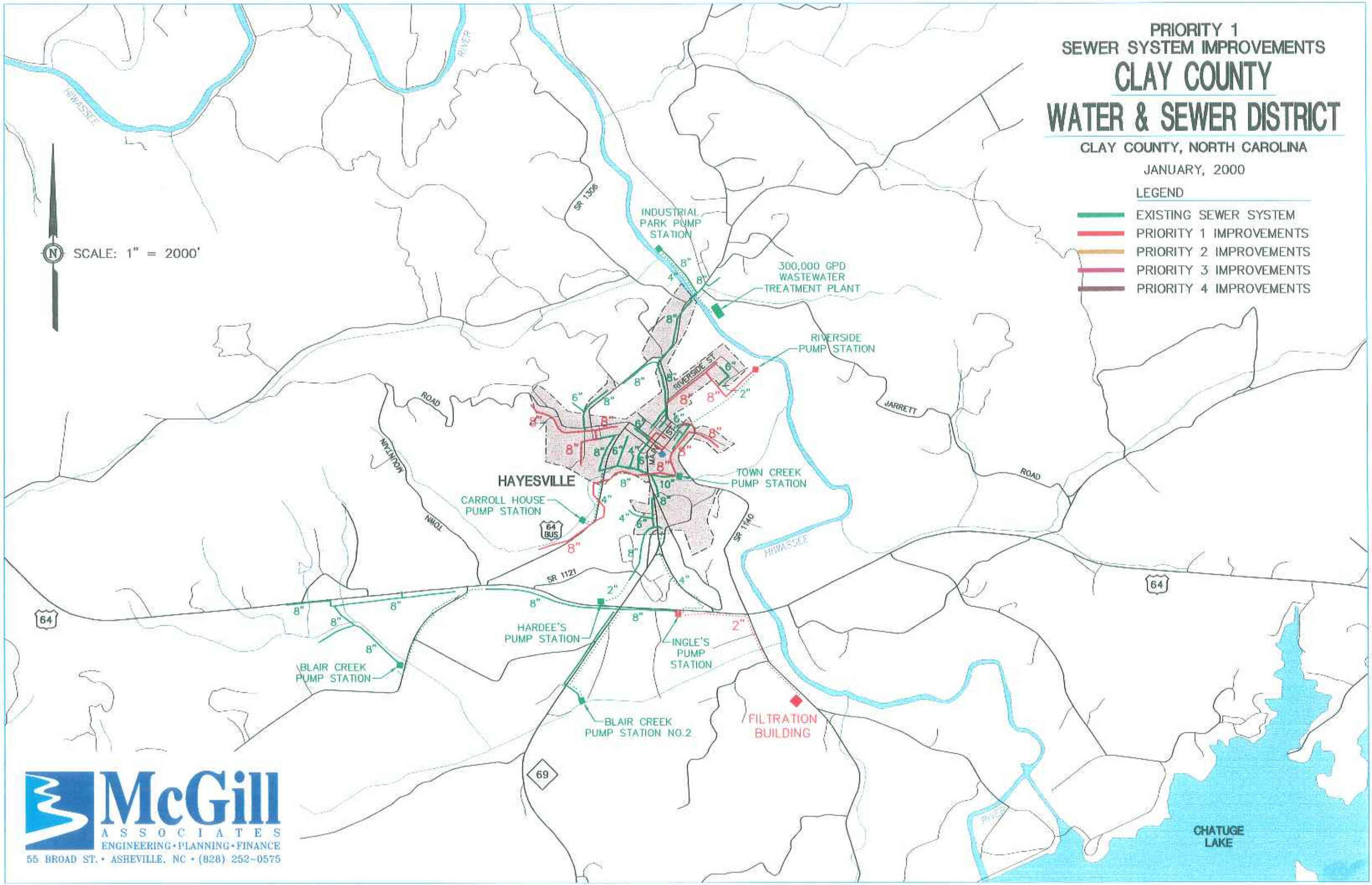
PRIORITY 1
SEWER SYSTEM IMPROVEMENTS
CLAY COUNTY
WATER & SEWER DISTRICT
CLAY COUNTY, NORTH CAROLINA
JANUARY, 2000
LEGEND
EXISTING SEWER SYSTEM
PRIORITY 1 IMPROVEMENTS
PRIORITY 2 IMPROVEMENTS
PRIORITY 3 IMPROVEMENTS
PRIORITY 4 IMPROVEMENTS
N
SCALE: 1" = 2000'
HIWASSEE
RIVER
SR 1306
INDUSTRIAL PARK PUMP STATION
300,000 GPD WASTEWATER TREATMENT PLANT
RIVERSIDE PUMP STATION
RIVERSIDE ST
JARRETT
ROAD
MOUNTAIN
TOWN
HAYESVILLE
TOWN CREEK PUMP STATION
CARROLL HOUSE PUMP STATION
64 BUS
SR 1140
SR 1121
64
HARDEE'S PUMP STATION
INGLE'S PUMP STATION
BLAIR CREEK PUMP STATION
BLAIR CREEK PUMP STATION NO.2
FILTRATION BUILDING
69
CHATUGE LAKE
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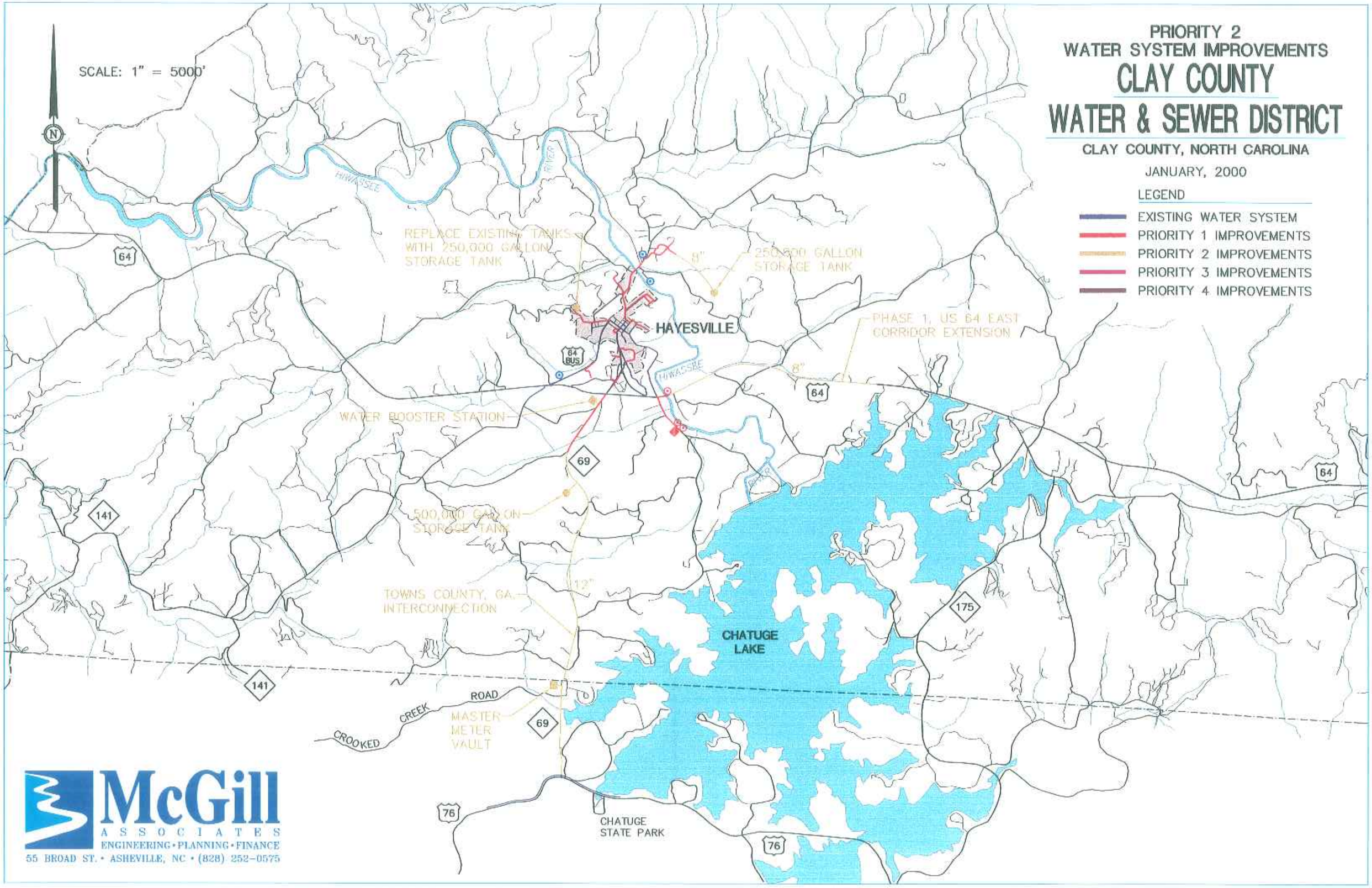
PRIORITY 2
WATER SYSTEM IMPROVEMENTS
CLAY COUNTY
WATER & SEWER DISTRICT
CLAY COUNTY, NORTH CAROLINA
JANUARY, 2000
LEGEND
EXISTING WATER SYSTEM
PRIORITY 1 IMPROVEMENTS
PRIORITY 2 IMPROVEMENTS
PRIORITY 3 IMPROVEMENTS
PRIORITY 4 IMPROVEMENTS
SCALE: 1" = 5000'
N
HIWASSEE
RIVER
REPLACE EXISTING TANKS WITH 250,000 GALLON STORAGE TANK
8"
250,000 GALLON STORAGE TANK
HAYESVILLE
PHASE 1, US 64 EAST CORRIDOR EXTENSION
8"
WATER BOOSTER STATION
500,000 GALLON STORAGE TANK
12"
TOWNS COUNTY, GA. INTERCONNECTION
CHATUGE LAKE
CROOKED CREEK ROAD
MASTER METER VAULT
CHATUGE STATE PARK
64
64 BUS
69
141
175
76
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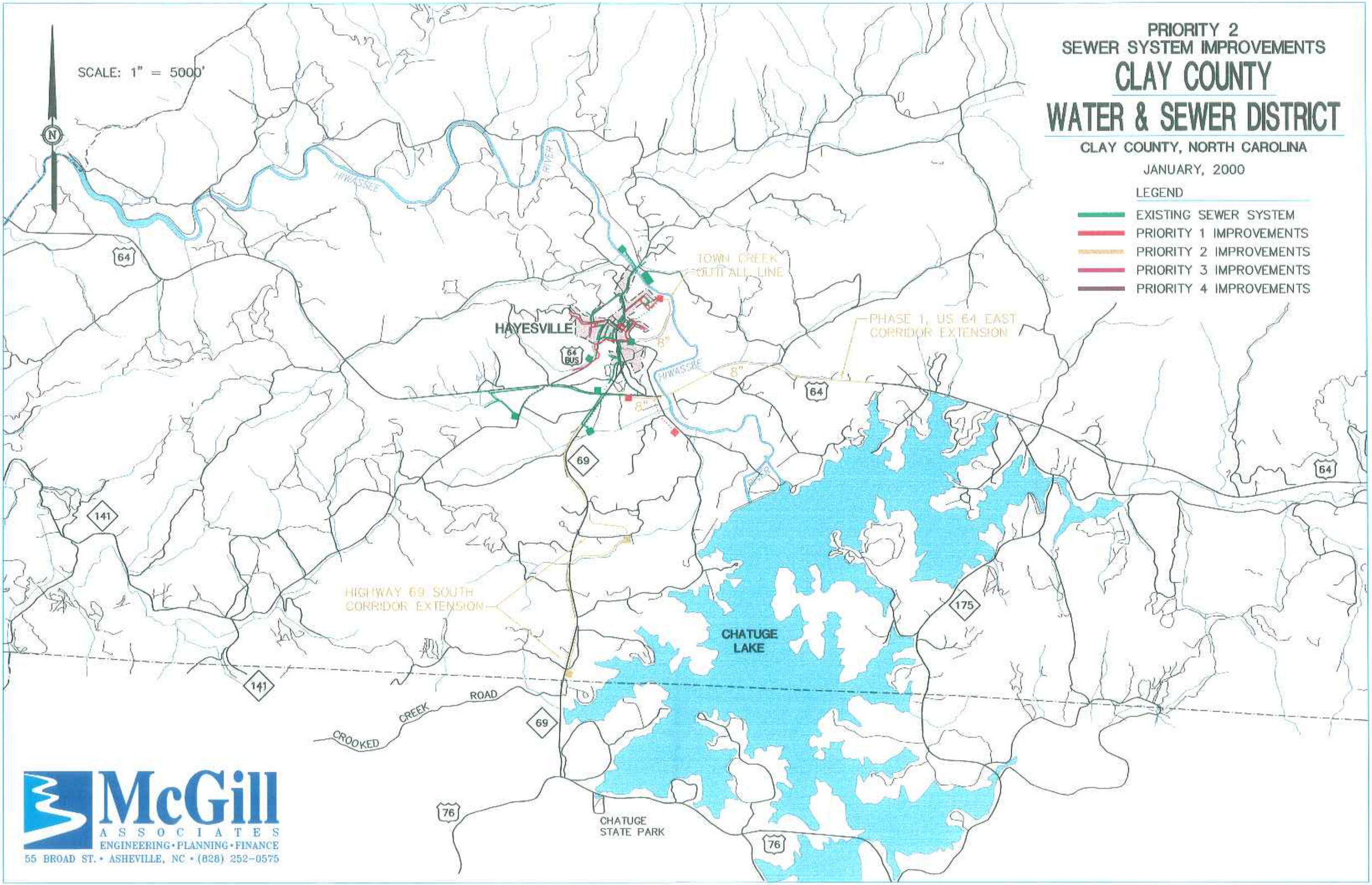
PRIORITY 2
SEWER SYSTEM IMPROVEMENTS
CLAY COUNTY
WATER & SEWER DISTRICT
CLAY COUNTY, NORTH CAROLINA
JANUARY, 2000
LEGEND
EXISTING SEWER SYSTEM
PRIORITY 1 IMPROVEMENTS
PRIORITY 2 IMPROVEMENTS
PRIORITY 3 IMPROVEMENTS
PRIORITY 4 IMPROVEMENTS
SCALE: 1" = 5000'
N
HIWASSEE
RIVER
64
TOWN CREEK
CUTOFF LINE
HAYESVILLE
64 BUS
8"
PHASE 1, US 64 EAST
CORRIDOR EXTENSION
69
141
HIGHWAY 69 SOUTH
CORRIDOR EXTENSION
CHATUGE
LAKE
175
CROOKED CREEK ROAD
76
CHATUGE
STATE PARK
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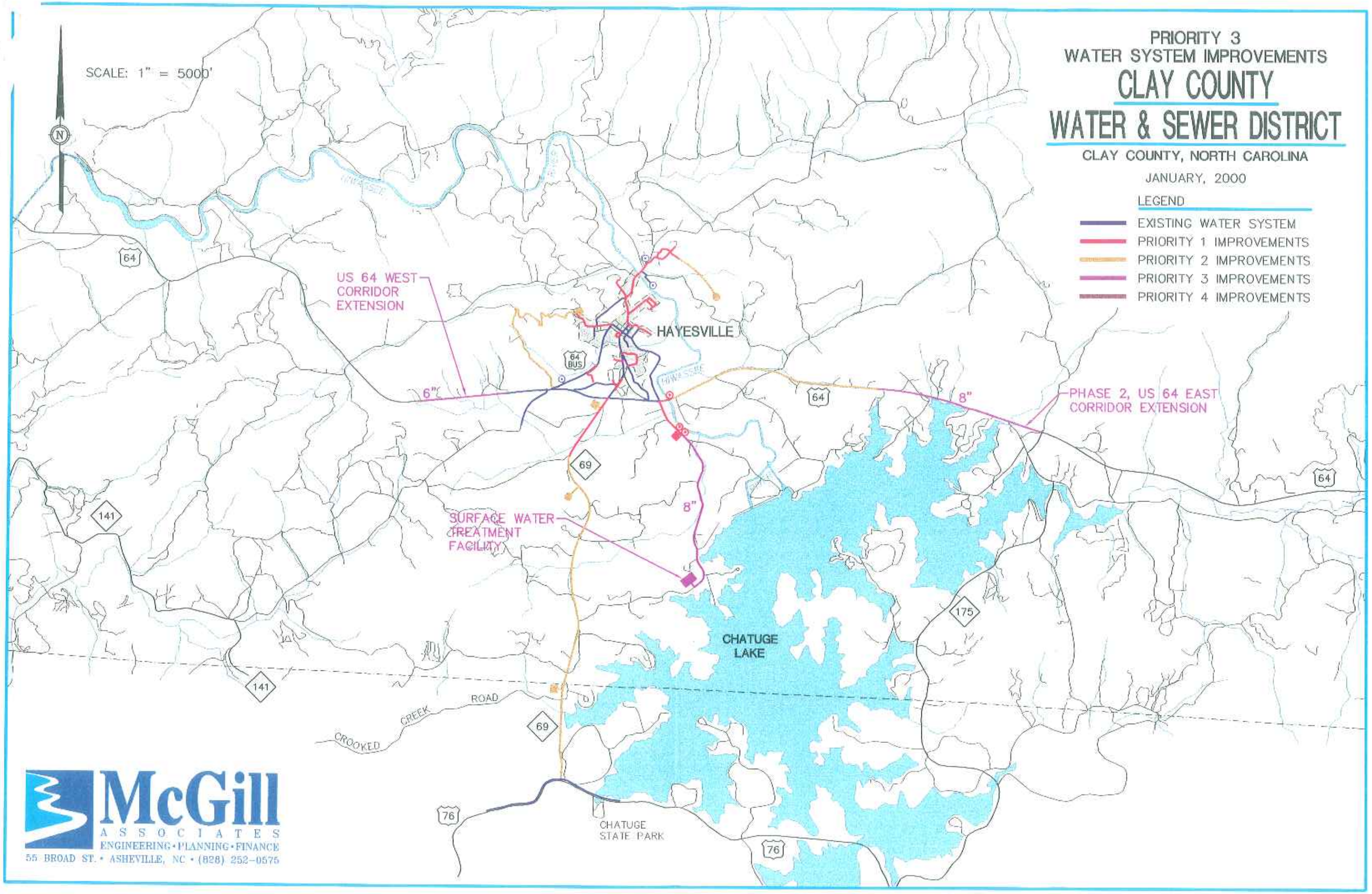
PRIORITY 3
WATER SYSTEM IMPROVEMENTS
CLAY COUNTY
WATER & SEWER DISTRICT
CLAY COUNTY, NORTH CAROLINA
JANUARY, 2000
LEGEND
EXISTING WATER SYSTEM
PRIORITY 1 IMPROVEMENTS
PRIORITY 2 IMPROVEMENTS
PRIORITY 3 IMPROVEMENTS
PRIORITY 4 IMPROVEMENTS
SCALE: 1" = 5000'
N
US 64 WEST CORRIDOR EXTENSION
HAYESVILLE
6"
8"
8"
PHASE 2, US 64 EAST CORRIDOR EXTENSION
SURFACE WATER TREATMENT FACILITY
CHATUGE LAKE
CHATUGE STATE PARK
CROOKED CREEK ROAD
64
64 BUS
69
141
175
76
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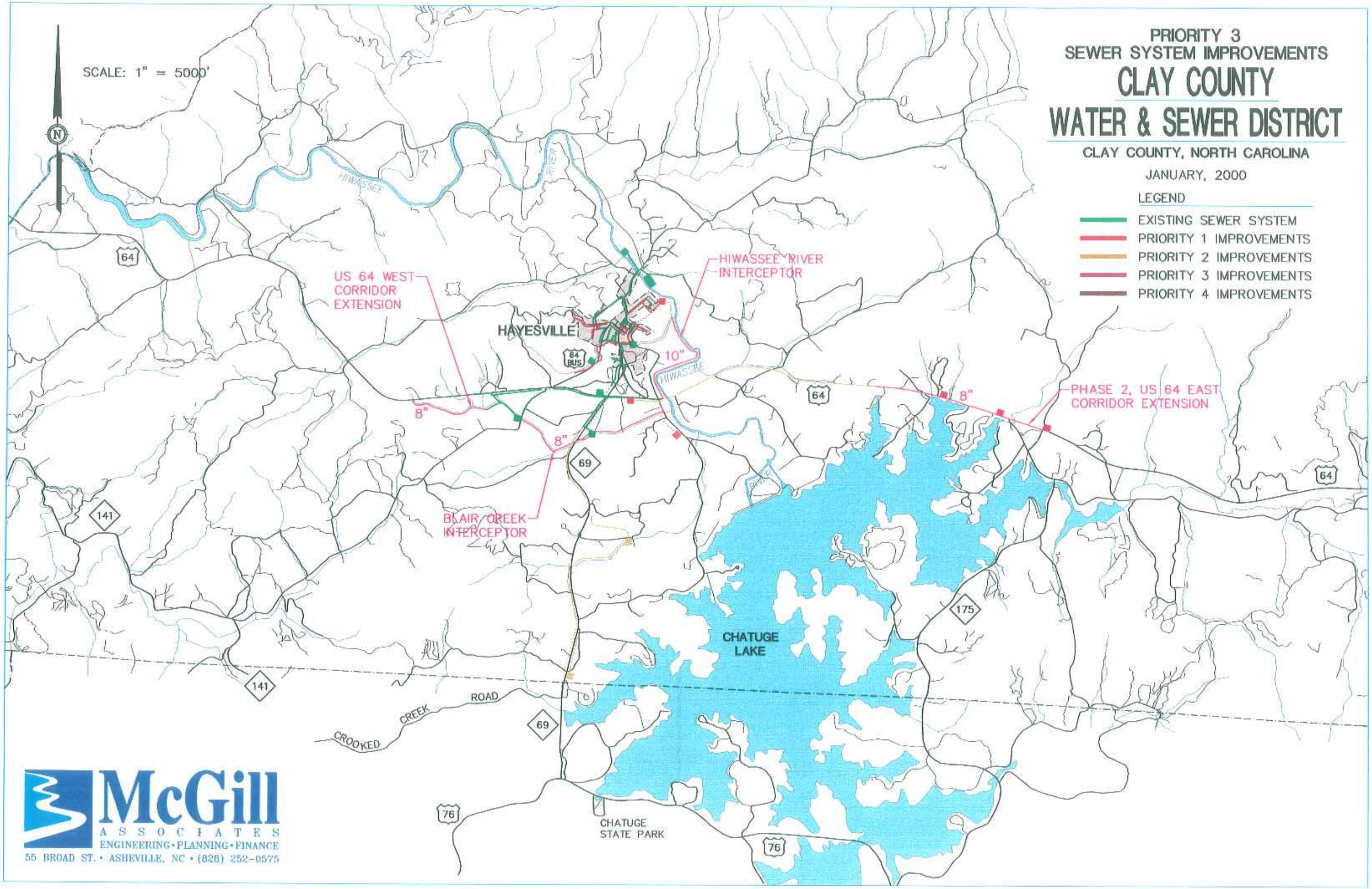
PRIORITY 3
SEWER SYSTEM IMPROVEMENTS
CLAY COUNTY
WATER & SEWER DISTRICT
CLAY COUNTY, NORTH CAROLINA
JANUARY, 2000
LEGEND
EXISTING SEWER SYSTEM
PRIORITY 1 IMPROVEMENTS
PRIORITY 2 IMPROVEMENTS
PRIORITY 3 IMPROVEMENTS
PRIORITY 4 IMPROVEMENTS
SCALE: 1" = 5000'
N
HIWASSEE
RIVER
US 64 WEST CORRIDOR EXTENSION
HIWASSEE RIVER INTERCEPTOR
HAYESVILLE
64 BUS
10"
8"
8"
8"
PHASE 2, US 64 EAST CORRIDOR EXTENSION
BLAIR CREEK INTERCEPTOR
64
69
141
175
76
CHATUGE LAKE
CROOKED CREEK ROAD
CHATUGE STATE PARK
McGill
ASSOCIATES
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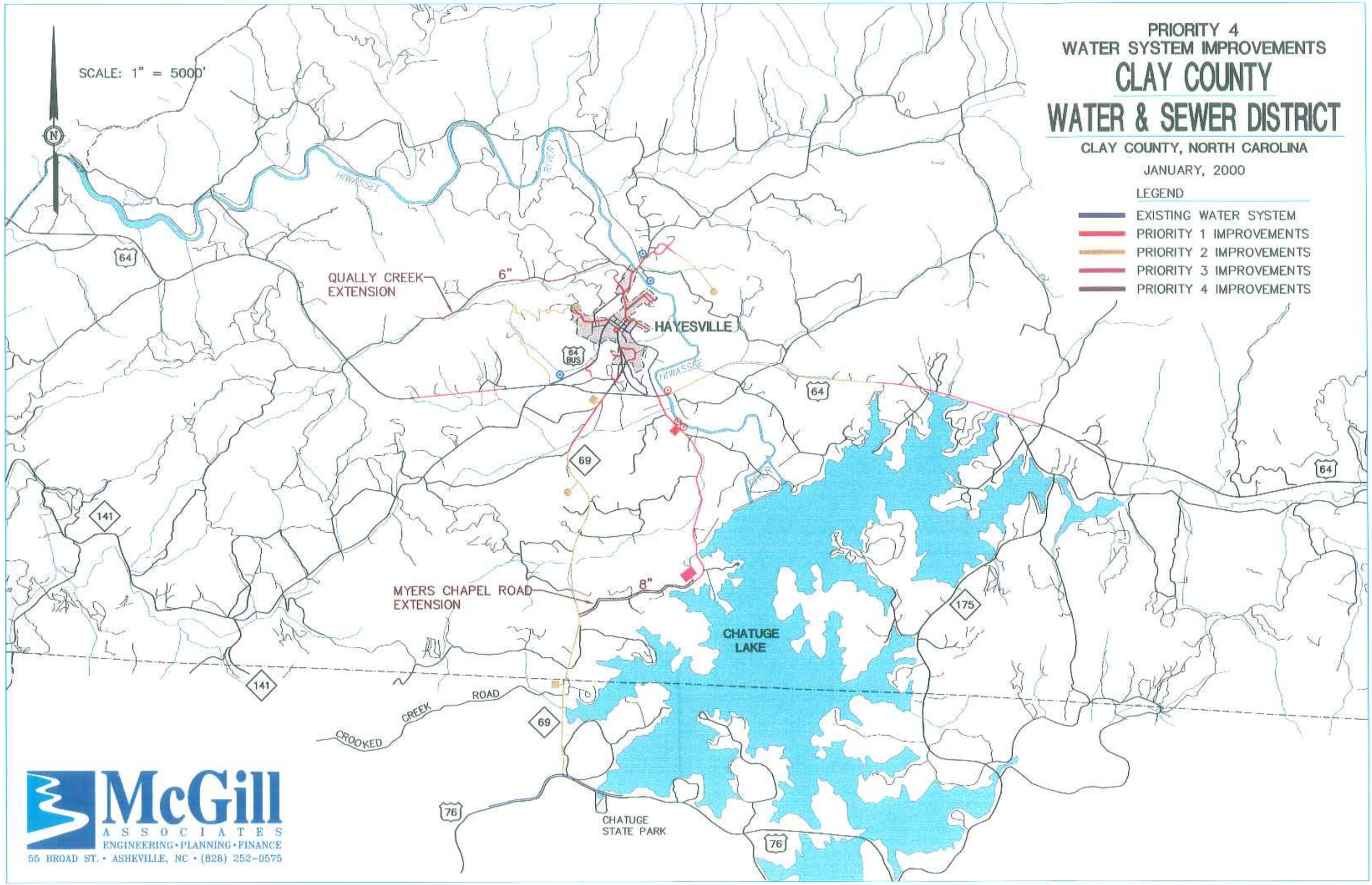
PRIORITY 4
WATER SYSTEM IMPROVEMENTS
CLAY COUNTY
WATER & SEWER DISTRICT
CLAY COUNTY, NORTH CAROLINA
JANUARY, 2000
LEGEND
EXISTING WATER SYSTEM
PRIORITY 1 IMPROVEMENTS
PRIORITY 2 IMPROVEMENTS
PRIORITY 3 IMPROVEMENTS
PRIORITY 4 IMPROVEMENTS
SCALE: 1" = 5000'
N
HIWASSEE
RIVER
QUALLY CREEK
EXTENSION
6"
HAYESVILLE
64 BUS
64
69
141
MYERS CHAPEL ROAD
EXTENSION
8"
CHATUGE
LAKE
175
CROOKED
CREEK
ROAD
76
CHATUGE
STATE PARK
McGill
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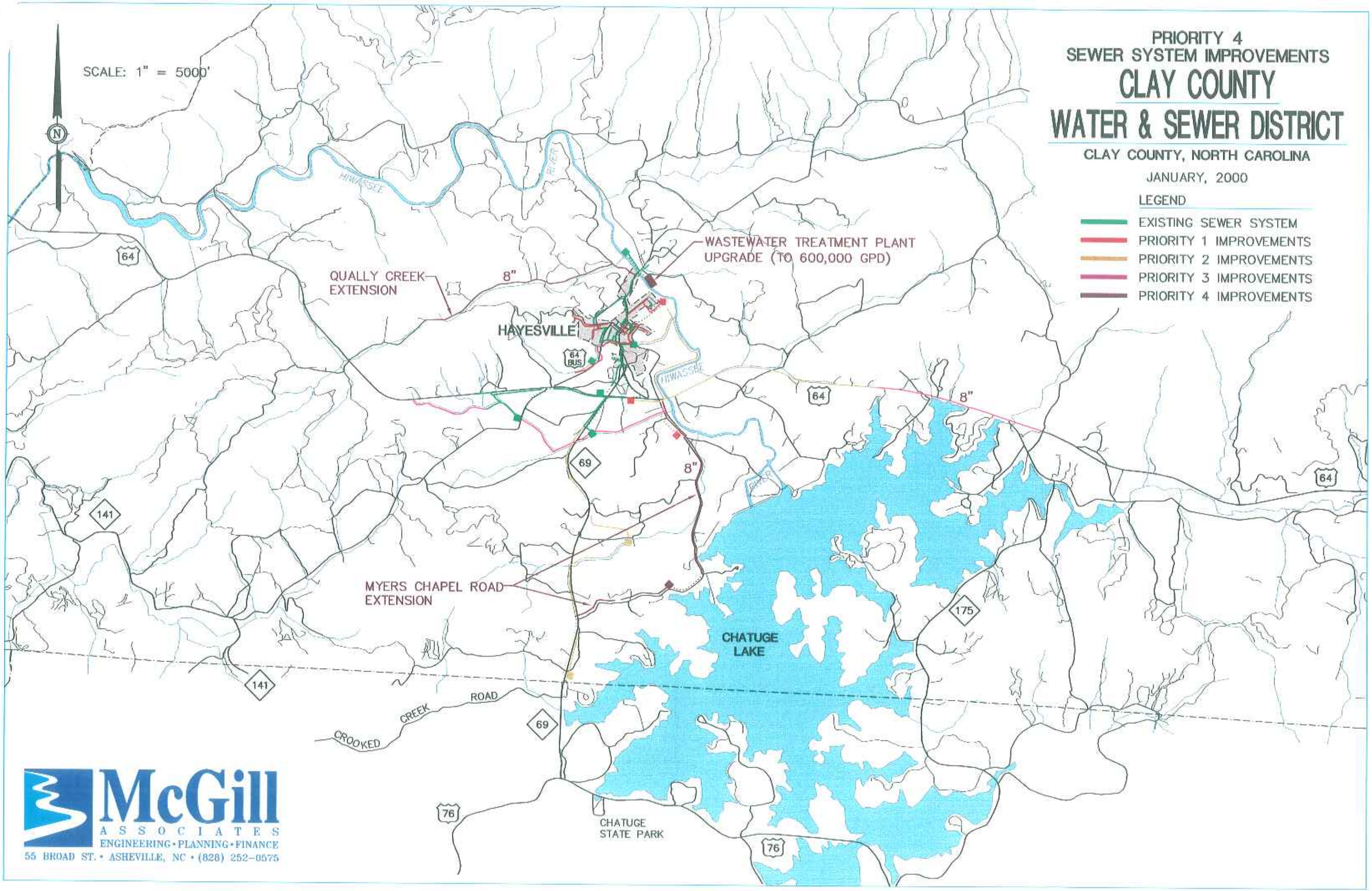
PRIORITY 4
SEWER SYSTEM IMPROVEMENTS
CLAY COUNTY
WATER & SEWER DISTRICT
CLAY COUNTY, NORTH CAROLINA
JANUARY, 2000
LEGEND
EXISTING SEWER SYSTEM
PRIORITY 1 IMPROVEMENTS
PRIORITY 2 IMPROVEMENTS
PRIORITY 3 IMPROVEMENTS
PRIORITY 4 IMPROVEMENTS
SCALE: 1" = 5000'
N
HIWASSEE
RIVER
WASTEWATER TREATMENT PLANT
UPGRADE (TO 600,000 GPD)
QUALLY CREEK
EXTENSION
8"
HAYESVILLE
64 BUS
64
69
141
175
76
MYERS CHAPEL ROAD
EXTENSION
CHATUGE
LAKE
CROOKED CREEK ROAD
CHATUGE
STATE PARK
McGill
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