

# Chatham County Water 2007-2011 Capital Improvements Program

## About the Capital Improvements Program (CIP)

The CIP is a long-term plan for funding the County's major capital needs. It shows how facilities, equipment, and other projects, which cost \$25,000 or more, could be scheduled and funded over the next five years, beginning in FY 2007, next fiscal year. While the CIP is a recommendation for funding capital projects, any projects that are recommended to be funded from operating revenues in FY 2006 have been adopted by the Board of Commissioners as part of the FY 2006 operating budget.

## CIP Process

The CIP is a plan which is updated annually during the budget process and may be modified at any time to reflect changing conditions. A CIP is a systematic way of anticipating, planning, and budgeting for major projects. The adoption of a CIP can improve the credit worthiness (bond rating) of a jurisdiction.

CIP requests originate at the department level. The Manager's Office reviews new and existing requests and recommends a proposed CIP to the Board of Commissioners.

The CIP section includes summaries of the major projects and detailed descriptions of each project, including justifications, cost detail, funding sources, and impact on the operating budget. If a project requires a contribution from General Fund operating revenues, this funding amount is identified in the cost detail as "operating revenue". The effect on the operating budget is also summarized under the "Operating Impact" section of each project description.

## Assumptions

Staff makes every attempt to identify and quantify the impacts of capital projects on the operating budget. Costs are inflated by a factor of three percent per year.

## Water Fund

### Total Cost of Each Project by Year

	Prior to FY 2005-06	Current Year: FY 2005-06	Year 1: FY 2006-07	Year 2: FY 2007-08	Year 3 FY 2008-09	Year 4: FY 2009-10	Year 5: FY 2010-11	Project Totals
Goldston Sewer Line	0	0	1,200,000	0	0	0	0	1,200,000
Long-term Water Supply	0	2,015,000	1,265,000	0	25,100,000	0	0	28,380,000
North Chatham Hydraulic Improvements	467,939	2,432,062	0	0	0	0	0	2,900,001
Pea Ridge Road (Group B) Project	360,294	12,839,706	0	0	0	0	0	13,200,000
Silk Hope School Water Main Extension	46,000	1,454,000	0	0	0	0	0	1,500,000
Southeast Water District Distribution Lines Construction	27,625	352	4,472,022	0	0	0	0	4,499,999
Southwest Water District Distribution Lines Construction	29,079	352	0	7,970,569	0	0	0	8,000,000
Water Main Extension - Southern Supreme	0	500,000	0	0	0	0	0	500,000
Water Treatment Plant Modifications	1,029,465	0	0	0	0	0	0	1,029,465
Western Transmission Mains	636,204	369,419	11,994,378	0	0	0	0	13,000,001
<b>Total Water</b>	<b>2,596,606</b>	<b>19,610,891</b>	<b>18,931,400</b>	<b>7,970,569</b>	<b>25,100,000</b>	<b>0</b>	<b>0</b>	<b>74,209,466</b>

# Funding Sources

The table below shows a summary of the funding sources for CIP projects by year. The major revenue sources are bonds, installment purchases, operating revenues, and grants.

	Prior to FY 2005-06	Current Year: FY 2005-06	Year 1: FY 2006-07	Year 2: FY 2007-08	Year 3: FY 2008-09	Year 4: FY 2009-10	Year 5: FY 2010-11	Totals
Capital Reserves	994,597	1,714,000	0	0	0	0	0	2,708,597
Grants, Gifts, Etc.	0	240,000	0	0	0	0	0	240,000
Installment Purchase	0	2,015,000	1,265,000	0	25,100,000	0	0	28,380,000
Installment Purchase/COPs/Bonds	1,521,141	15,641,891	17,584,150	7,693,569	0	0	0	42,440,751
Other -- Tap Fees	0	0	82,250	277,000	0	0	0	359,250
Water Fund Operating Revenue	80,868	0	0	0	0	0	0	80,868
<b>Total</b>	2,596,606	19,610,891	18,931,400	7,970,569	25,100,000	0	0	74,209,466

# Operating Budget Effects

The table below shows the combined effect of the recommended projects for the next five years. Operating costs include debt service, increased operating costs, decreased operating costs, additional revenues, and operating revenue necessary to fund the project.

	Prior to FY 2005-06	Current Year: FY 2005-06	Year 1: FY 2006-07	Year 2: FY 2007-08	Year 3: FY 2008-09	Year 4: FY 2009-10	Year 5: FY 2010-11
Additional Revenues	0	0	-199,200	-199,200	-445,920	-445,920	-445,920
Debt Service	0	0	916,015	5,257,260	5,479,314	5,395,949	5,312,584
Increased Operating Costs	0	0	401,822	413,887	4,418,736	4,444,207	4,470,442
Water Fund Operating Revenue	80,868	0	0	0	0	0	0
<b>Total Water</b>	80,868	0	1,118,637	5,471,947	9,452,130	9,394,236	9,337,106

# Goldston Sewer Line

Construction of a sewer line from the City of Sanford to the Town of Goldston.

<b>Project Budget</b>	<b>Prior to FY 05-06</b>	<b>Current Year: FY 05-06</b>	<b>Year 1: FY 06-07</b>	<b>Year 2: FY07-08</b>	<b>Year 3: FY 08-09</b>	<b>Year 4: FY 09-10</b>	<b>Year 5: FY 10-11</b>	<b>Project Totals</b>
<b>Project Element</b>								
Construction	0	0	1,200,000	0	0	0	0	1,200,000
<b>Total Project Element</b>	0	0	1,200,000	0	0	0	0	1,200,000
<b>Funding Source</b>								
Installment Purchase/COPs/Bonds	0	0	1,200,000	0	0	0	0	1,200,000
<b>Total Funding Source</b>	0	0	1,200,000	0	0	0	0	1,200,000
<b>Operating Effect</b>								
Debt Service	0	0	0	98,343	98,343	98,343	98,343	393,372
<b>Total Operating Effect</b>	0	0	0	98,343	98,343	98,343	98,343	393,372

## Define Problem

The Town of Goldston historically has had problems with adequate sewer. Earlier this year, the county explored the possibility of running a sewer line from the City of Sanford to serve an industry in Goldston. Although this effort was not successful, the City of Sanford is willing to provide up to 100,000 gallons per day of sewer capacity to the town. The county has initiated discussions with the Town of Goldston, which would be responsible for running sewer lines within the town.

## Recommended Solution

Provide funding for a main sewer line to be run from the City of Sanford to the Town of Goldston.

## Current Stage of Project

Preliminary cost estimates have been obtained.

# Long-term Water Supply

Provide for a long-term (20 year) solution for Chatham County's water supply.

<b>Project Budget</b>	<b>Prior to FY 05-06</b>	<b>Current Year: FY 05-06</b>	<b>Year 1: FY 06-07</b>	<b>Year 2: FY07-08</b>	<b>Year 3: FY 08-09</b>	<b>Year 4: FY 09-10</b>	<b>Year 5: FY 10-11</b>	<b>Project Totals</b>
<b>Project Element</b>								
Construction	0	2,015,000	0	0	22,695,000	0	0	24,710,000
Contingency	0	0	0	0	2,405,000	0	0	2,405,000
Land	0	0	50,000	0	0	0	0	50,000
Planning	0	0	1,215,000	0	0	0	0	1,215,000
<b>Total Project Element</b>	<b>0</b>	<b>2,015,000</b>	<b>1,265,000</b>	<b>0</b>	<b>25,100,000</b>	<b>0</b>	<b>0</b>	<b>28,380,000</b>
<b>Funding Source</b>								
Installment Purchase	0	2,015,000	1,265,000	0	25,100,000	0	0	28,380,000
<b>Total Funding Source</b>	<b>0</b>	<b>2,015,000</b>	<b>1,265,000</b>	<b>0</b>	<b>25,100,000</b>	<b>0</b>	<b>0</b>	<b>28,380,000</b>
<b>Operating Effect</b>								
Debt Service	0	0	0	3,255,216	3,171,850	3,088,485	3,005,120	12,520,671
Increased Operating Costs	0	0	0	0	3,569,700	3,569,700	3,569,700	10,709,100
<b>Total Operating Effect</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>3,255,216</b>	<b>6,741,550</b>	<b>6,658,185</b>	<b>6,574,820</b>	<b>23,229,771</b>

## Define Problem

Currently, Chatham County's maximum allocation for Jordan Lake is 6 million gallons. The County has twice attempted to raise our allocation. These attempts were not successful, and the state shows no signs of reopening the allocation process. Chatham County has explored other options to provide long-term water supply. We are planning for a 25-year solution.

## Recommended Solution

As of the adoption of the CIP, no preferred option has been identified. The project cost is based on the most expensive option: partnering with Harnett County.

## Alternatives

The alternatives are: 1) participate in the upgrade of Harnett County's water treatment plant and construct a transmission main from Harnett County to Pea Ridge Road; 2) partner with the City of Sanford by participating in the upgrade of their water plan and constructing a transmission line to Pea Ridge Road; and 3) obtain additional allocation from Jordan Lake and expand our water treatment plant.

## Current Stage of Project

Options are being evaluated.

## Relation to Other Projects

Many of the water line projects are related in that an adequate long-term water supply is needed.

# Long-term Water Supply

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**Description of Land Needs**

Land for rights of way.

**Professional Services Needed**

Engineering and construction management services will be needed.

**Operating Impact**

Additional funds will need needed for the purchase of water from Harnett or Sanford and for debt service.

# North Chatham Hydraulic Improvements

Upgrade the North Chatham Water System’s hydraulic system to address existing problems with water pressure and problems with pressure reaction in the lines (water hammer) and to allow for the expansion of the northern water system.

<b>Project Budget</b>	<b>Prior to FY 05-06</b>	<b>Current Year: FY 05-06</b>	<b>Year 1: FY 06-07</b>	<b>Year 2: FY07-08</b>	<b>Year 3: FY 08-09</b>	<b>Year 4: FY 09-10</b>	<b>Year 5: FY 10-11</b>	<b>Project Totals</b>
<b>Project Element</b>								
Construction	301,146	2,115,521	0	0	0	0	0	2,416,667
Contingency	0	241,667	0	0	0	0	0	241,667
Planning	166,793	74,874	0	0	0	0	0	241,667
<b>Total Project Element</b>	<b>467,939</b>	<b>2,432,062</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,900,001</b>
<b>Funding Source</b>								
Installment Purchase/COPs/Bonds	467,939	2,432,062	0	0	0	0	0	2,900,001
<b>Total Funding Source</b>	<b>467,939</b>	<b>2,432,062</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>2,900,001</b>
<b>Operating Effect</b>								
Debt Service	0	0	237,662	237,662	237,662	237,662	237,662	1,188,310
<b>Total Operating Effect</b>	<b>0</b>	<b>0</b>	<b>237,662</b>	<b>237,662</b>	<b>237,662</b>	<b>237,662</b>	<b>237,662</b>	<b>1,188,310</b>

## Define Problem

The system currently operates with two pressure zones and water is supplied from the water treatment plant to the Governors Club Booster Pump Station through series pumping. The Governors Club Booster Pump Station is limited in capacity and will not be capable of meeting the needs of the system as it expands.

The existing hydraulics of the northern system creates pressure variances and water hammer. Because of this, water mains and service breaks are common in this area. Existing customers also experience erratic pressures.

## Recommended Solution

Perform the following system improvements:

1. Construct a 500,000-gallon elevated tank and booster pump station at the intersection of Jack Bennett and Lystra roads.
2. Construct a 12-inch ductile Iron transmission water main from the intersection of Jack Bennett Road and Lystra Road north on Lystra to the intersection of Carson Road.
3. Install a control valve at the Lystra Road entrance of the Governors Club.
4. Install three reduce pressure valve assemblies at the north points of entry into Fearington Village at Village Way, Weathersfield, and the service entrance into Fearington.

The North Chatham Hydraulic Improvements will change the operating parameters of the North Chatham Distribution System to correct and simplify operation of the system. These improvements will also address the future system configuration based on the growth the system is experiencing. This project will

## **North Chatham Hydraulic Improvements**

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upgrade storage and pumping capacities in the system to provide a more efficient operation of the system and help meet future demands including supplying a currently approved one-million-gallon elevated tank on Manns Chapel Road that will be constructed with the Briars Chapel Development. The project will eliminate one of the two pressure zones in this system, modify the pumping arrangement and add storage to the system.

### **Current Stage of Project**

As of November 8, 2005 the first phase of the project, the transmission water main installation on Lystra Road and the installation of the three pressure reducing valves for Fearrington have been completed. The second phase of the project, the construction of the Booster pump Station and erecting of the 500,000 gallon elevated tank at the intersection of Jack Bennett Road and Lystra Road, has begun and the contractor hopes to be finished before the end of this fiscal year.

### **Professional Services Needed**

Inspections and supervision of the project construction by the design engineers Hobbs and Upchurch.

### **Operating Impact**

Funds for additional maintenance will be needed.

## Pea Ridge Road (Group B) Project

Construction of main trunk lines to serve existing customers currently being served through water purchases from other jurisdictions and to serve future customers in the newly approved water districts. Increase capacity of Jordan Lake Water Treatment Plant to serve additional customers.

<b>Project Budget</b>	<b>Prior to FY 05-06</b>	<b>Current Year: FY 05-06</b>	<b>Year 1: FY 06-07</b>	<b>Year 2: FY07-08</b>	<b>Year 3: FY 08-09</b>	<b>Year 4: FY 09-10</b>	<b>Year 5: FY 10-11</b>	<b>Project Totals</b>
<b>Project Element</b>								
Construction	255,053	10,643,040	0	0	0	0	0	10,898,093
Contingency	0	1,098,333	0	0	0	0	0	1,098,333
Land	105,241	0	0	0	0	0	0	105,241
Planning	0	1,098,333	0	0	0	0	0	1,098,333
<b>Total Project Element</b>	<b>360,294</b>	<b>12,839,706</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,200,000</b>
<b>Funding Source</b>								
Installment Purchase/COPs/Bonds	360,294	12,839,706	0	0	0	0	0	13,200,000
<b>Total Funding Source</b>	<b>360,294</b>	<b>12,839,706</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,200,000</b>
<b>Operating Effect</b>								
Debt Service	0	0	678,353	678,353	678,353	678,353	678,353	3,391,765
Increased Operating Costs	0	0	135,000	139,060	143,222	147,519	151,944	716,745
<b>Total Operating Effect</b>	<b>0</b>	<b>0</b>	<b>813,353</b>	<b>817,413</b>	<b>821,575</b>	<b>825,872</b>	<b>830,297</b>	<b>4,108,510</b>

### Define Problem

Currently Chatham County has bulk purchase agreements with Siler City (\$4.50 per 1,000 gals.), Sanford (\$2.67 per 1,000 gals.), and Goldston- Gulf Sanitary District (\$3.15 per 1,000 gals.). Chatham County also maintains an emergency interconnect with Durham (\$2.67 per 1,000 gals.) and with Orange Water and Sewer Authority.

Chatham County intends to maximize use of the Jordan Lake Water Treatment Plant and its six-million gallon per day allocation from Jordan Lake to serve as the supply for all three of the county's water systems and reduce reliance on regional sources. The Jordan Lake Water Treatment Plant was originally constructed to satisfy the need for County Water service in the northeast section of the county.

In an effort to meet growing needs of its citizens, Chatham County is in the process of constructing a rural water system in the southeastern and southwestern quadrants of the county. In addition, the county has approved and began construction of a water main on Silk Hope Rd. in the northwest section of the county to provide water to the Silk Hope School. This will be supplied initially by Siler City, but eventually this main will need to be tied into the new western transmission water system.

Water mains from the Jordan Lake Water Treatment Plant are needed to serve as trunk lines to transmit water from the treatment plant to these new systems.

# Pea Ridge Road (Group B) Project

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Chatham County has an agreement with Cary to provide our own raw water pumping station. The pumping station is also necessary to increase capacity of the plant to serve additional customers.

## **Recommended Solution**

Construction of water transmission main extensions that will consist of approximately 88,000 linear feet of 16-inch ductile Iron water mains approximately 9,400 linear feet of 12-inch Ductile Iron water mains.

Phase I of the project will serve the southeastern district. Phase II will serve the southwestern district. The project will begin at the Jordan Lake Water Treatment Plant and extend southward to the service area of the East Chatham Water System. Additional transmission mains will extend westward along Mt. View Church Road to the intersection with US 15-501 North. The installation of these large water mains is necessary because this project is the first phase of a multi-phased construction project that will create multiple new water districts in Chatham County. This first phase of water transmission mains will serve to transmit potable water from the Jordan Lake Water Treatment Plant to western portions of the county including Gulf Goldston and Bear Creek Townships.

The project will also consist of providing our own raw water pumping station by construction a two-million-gallon clear well, installation of a separate raw water pump facility at the Cary intake, and construction of a raw water line to the plant.

Finally, a new high service water pumping station will be installed to provide additional pumping capacity from the plant to the distribution system.

## **Current Stage of Project**

As of November 8, 2005 materials for phase I of the project have begun to be delivered on site and the contractor began work on November 14. 2,800 feet of water pipe has been installed to date. All road bores have been completed. The project is expected to be complete by June 2006.

## **Relation to Other Projects**

The project is necessary to provide service to the southeast and southwest water districts.

## **Professional Services Needed**

Inspections and supervision of the project construction by the design engineers Hobbs and Upchurch.

## **Operating Impact**

Additional maintenance funds will be required.

# Silk Hope School Water Main Extension

Construct a water main to serve Silk Hope School.

<b>Project Budget</b>	<b>Prior to FY 05-06</b>	<b>Current Year: FY 05-06</b>	<b>Year 1: FY 06-07</b>	<b>Year 2: FY07-08</b>	<b>Year 3: FY 08-09</b>	<b>Year 4: FY 09-10</b>	<b>Year 5: FY 10-11</b>	<b>Project Totals</b>
<b>Project Element</b>								
Construction	0	1,250,000	0	0	0	0	0	1,250,000
Contingency	0	125,000	0	0	0	0	0	125,000
Planning	46,000	79,000	0	0	0	0	0	125,000
<b>Total Project Element</b>	<b>46,000</b>	<b>1,454,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,500,000</b>
<b>Funding Source</b>								
Capital Reserves	46,000	1,454,000	0	0	0	0	0	1,500,000
<b>Total Funding Source</b>	<b>46,000</b>	<b>1,454,000</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,500,000</b>
<b>Operating Effect</b>								
Additional Revenues	0	0	-19,200	-19,200	-19,200	-19,200	-19,200	-96,000
Increased Operating Costs	0	0	40,224	41,431	42,674	43,954	45,273	213,556
<b>Total Operating Effect</b>	<b>0</b>	<b>0</b>	<b>21,024</b>	<b>22,231</b>	<b>23,474</b>	<b>24,754</b>	<b>26,073</b>	<b>117,556</b>

## Define Problem

This project was approved by the Board of Commissioners due to the on going problems at the Silk Hope School with its current water supply that is furnished by a well. By installing the water main and establishing connection with the Siler City Water System, the county will be able to supply the Silk Hope School with an adequate and reliable source of potable water.

## Recommended Solution

Construct a water line for a connection with the Town of Siler City's water system on U.S. 64 along U.S. 64, Silk Hope Road, and Silk Hope-Gum Springs Road to the Silk Hope School.

## Current Stage of Project

The contractor has completed over 50% of the water main installation along the Silk Hope Road section. The county has received permission from the NC DOT to cross the Rocky River with a bridge attachment and to cross over two other culverts, which will save the county approximately \$120,000.

## Professional Services Needed

Daily inspection and supervision of construction.

## Operating Impact

The county will have to pay Slier City for monthly usage at rate of \$4.50 per thousand gallons and pay for maintenance of the water line.

# Southeast Water District Distribution Lines Construction

Installation of approximately 23 miles of water distribution mains in the Southeast Water District.

<b>Project Budget</b>	<b>Prior to FY 05-06</b>	<b>Current Year: FY 05-06</b>	<b>Year 1: FY 06-07</b>	<b>Year 2: FY07-08</b>	<b>Year 3: FY 08-09</b>	<b>Year 4: FY 09-10</b>	<b>Year 5: FY 10-11</b>	<b>Project Totals</b>
<b>Project Element</b>								
Construction	0	0	3,733,333	0	0	0	0	3,733,333
Contingency	0	0	373,333	0	0	0	0	373,333
Land	0	0	20,000	0	0	0	0	20,000
Planning	27,625	352	345,356	0	0	0	0	373,333
<b>Total Project Element</b>	<b>27,625</b>	<b>352</b>	<b>4,472,022</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4,499,999</b>
<b>Funding Source</b>								
Installment Purchase/COPs/Bonds	27,625	352	4,389,772	0	0	0	0	4,417,749
Other -- Tap Fees	0	0	82,250	0	0	0	0	82,250
<b>Total Funding Source</b>	<b>27,625</b>	<b>352</b>	<b>4,472,022</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>4,499,999</b>
<b>Operating Effect</b>								
Additional Revenues	0	0	-180,000	-180,000	-180,000	-180,000	-180,000	-900,000
Debt Service	0	0	0	117,765	117,765	117,765	117,765	471,060
Increased Operating Costs	0	0	203,138	209,232	215,509	221,974	228,633	1,078,486
<b>Total Operating Effect</b>	<b>0</b>	<b>0</b>	<b>23,138</b>	<b>146,997</b>	<b>153,274</b>	<b>159,739</b>	<b>166,398</b>	<b>649,546</b>

## Define Problem

In order to provide county residents with a public source of drinking water, the Chatham County Board of Commissioners formed the Southeast Water District. The southeast district is comprised of Haw River, Oakland and Cape Fear townships.

In November 2004, voters approved a bond referendum for extension of water lines in the district. Funding is expected to be obtained from USDA-Rural Development in the form of loans.

## Recommended Solution

The project will include installation of approximately 23 miles of distribution main, ranging in diameter from six to eight inches. The mains will be located on NCDOT rights-of-way. The project is expected to add 375 new residential service connections and numerous commercial service connections. In addition to the new connections, the Southeast Chatham Water District will assume the ownership of the Moncure area water system currently owned and operated by Chatham County. This system consists of approximately 404 residential, commercial, and industrial customers. Water for the district will be provided through a bulk purchase arrangement with the Chatham County Utilities. Operation and maintenance of the District will also be provided by Chatham County Utilities through a contractual arrangement.

# **Southeast Water District Distribution Lines Construction**

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**Operating Impact**

Additional funds will be needed for maintenance of the lines and water production.

# Southwest Water District Distribution Lines Construction

Installation of approximately 48 miles of water distribution mains in the Southwest Water District.

<b>Project Budget</b>	<b>Prior to FY 05-06</b>	<b>Current Year: FY 05-06</b>	<b>Year 1: FY 06-07</b>	<b>Year 2: FY07-08</b>	<b>Year 3: FY 08-09</b>	<b>Year 4: FY 09-10</b>	<b>Year 5: FY 10-11</b>	<b>Project Totals</b>
<b>Project Element</b>								
Construction	0	0	0	6,632,500	0	0	0	6,632,500
Contingency	0	0	0	663,250	0	0	0	663,250
Land	0	0	0	41,000	0	0	0	41,000
Planning	29,079	352	0	633,819	0	0	0	663,250
<b>Total Project Element</b>	<b>29,079</b>	<b>352</b>	<b>0</b>	<b>7,970,569</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8,000,000</b>
<b>Funding Source</b>								
Installment Purchase/COPs/Bonds	29,079	352	0	7,693,569	0	0	0	7,723,000
Other -- Tap Fees	0	0	0	277,000	0	0	0	277,000
<b>Total Funding Source</b>	<b>29,079</b>	<b>352</b>	<b>0</b>	<b>7,970,569</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>8,000,000</b>
<b>Operating Effect</b>								
Additional Revenues	0	0	0	0	-246,720	-246,720	-246,720	-740,160
Debt Service	0	0	0	0	305,420	305,420	305,420	916,260
Increased Operating Costs	0	0	0	0	422,742	435,424	448,487	1,306,653
<b>Total Operating Effect</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>481,442</b>	<b>494,124</b>	<b>507,187</b>	<b>1,482,753</b>

## Define Problem

In order to provide county residents with a public source of drinking water, the Chatham County Board of Commissioners formed the Southwest Water District. The southwest district is comprised of Bear Creek and Gulf townships.

In November 2004, voters approved a bond referendum for extension of water lines in the district. Funding is expected to be obtained from USDA-Rural Development in the form of loans.

## Recommended Solution

The project will include installation of approximately 48 miles of distribution main, ranging in diameter from six to eight inches. The mains will be located on NCDOT rights-of-way. The project is expected to add 514 new residential service connections and numerous commercial service connections. In addition to the new connections, the Southwest Chatham Water District will assume the ownership of the Southwest Chatham area water system currently owned and operated by Chatham County. This system consists of approximately 900 residential, commercial, and industrial customers. Water for the district will be provided through a bulk purchase arrangement with the Chatham County Utilities. Operation and maintenance of the District will also be provided by Chatham County Utilities through a contractual arrangement. Water for the district will be provided through a bulk purchase arrangement with the Chatham County Utilities. Operation and maintenance of the District will also be provided by Chatham County Utilities through a contractual arrangement.

# Southwest Water District Distribution Lines Construction

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**Operating Impact**

Additional funds will be needed for maintenance of the lines and water production.

# Water Main Extension - Southern Supreme

Construction of a 17,000 feet of 6-inch water line along Hoytt Scott Road and Effie Welch Road in the southwestern portion of Chatham County to serve Southern Supreme so that the company can increase production and hire more employees.

<b>Project Budget</b>	<b>Prior to FY 05-06</b>	<b>Current Year: FY 05-06</b>	<b>Year 1: FY 06-07</b>	<b>Year 2: FY07-08</b>	<b>Year 3: FY 08-09</b>	<b>Year 4: FY 09-10</b>	<b>Year 5: FY 10-11</b>	<b>Project Totals</b>
<b>Project Element</b>								
Construction	0	416,666	0	0	0	0	0	416,666
Contingency	0	41,667	0	0	0	0	0	41,667
Planning	0	41,667	0	0	0	0	0	41,667
<b>Total Project Element</b>	0	500,000	0	0	0	0	0	500,000
<b>Funding Source</b>								
Capital Reserves	0	260,000	0	0	0	0	0	260,000
Grants, Gifts, Etc.	0	240,000	0	0	0	0	0	240,000
<b>Total Funding Source</b>	0	500,000	0	0	0	0	0	500,000
<b>Operating Effect</b>								
Debt Service	0	0	0	0	0	0	0	0
Increased Operating Costs	0	0	23,460	24,164	24,889	25,636	26,405	124,554
<b>Total Operating Effect</b>	0	0	23,460	24,164	24,889	25,636	26,405	124,554

### Define Problem

Southern Supreme would like to expand its existing facility. The existing well capacity is not sufficient to meet the increased water demand that would be required.

The county received \$240,000 from the NC Department of Commerce as a job retention project for this project. Twenty-four jobs will be retained through this action.

### Recommended Solution

Construction of a water line to serve Southern Supreme so that the company can increase production and hire more employees.

In addition to the grant funds, this water line will be part of the newly formed Southwest District, and the cost of construction will be paid back to the Water Capital Reserve.

### Current Stage of Project

Permitting is underway. Engineers anticipating bidding by February 2006.

### Professional Services Needed

## **Water Main Extension - Southern Supreme**

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Detailed engineering plans and construction management will be needed.

### **Operating Impact**

Additional maintenance funds will be required.

# Water Treatment Plant Modifications

Modifications to the Jordan Lake Water Treatment Plant to improve operations.

<b>Project Budget</b>	<b>Prior to FY 05-06</b>	<b>Current Year: FY 05-06</b>	<b>Year 1: FY 06-07</b>	<b>Year 2: FY07-08</b>	<b>Year 3: FY 08-09</b>	<b>Year 4: FY 09-10</b>	<b>Year 5: FY 10-11</b>	<b>Project Totals</b>
<b>Project Element</b>								
Contingency	0	0	0	0	0	0	0	0
Equipment	943,305	0	0	0	0	0	0	943,305
Planning	86,160	0	0	0	0	0	0	86,160
<b>Total Project Element</b>	<b>1,029,465</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,029,465</b>
<b>Funding Source</b>								
Capital Reserves	948,597	0	0	0	0	0	0	948,597
Water Fund Operating Revenue	80,868	0	0	0	0	0	0	80,868
<b>Total Funding Source</b>	<b>1,029,465</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>1,029,465</b>
<b>Operating Effect</b>								
Water Fund Operating Revenue	80,868	0	0	0	0	0	0	80,868
<b>Total Operating Effect</b>	<b>80,868</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>80,868</b>

## Define Problem

The Jordan Lake Water Treatment Plant began operations in 1996. A number of problems with the plant needed correction, including:

- The filter media had not been replaced since plant construction.
- The effluent chamber piping would not allow for increased backwash rates of the filters that would be necessary to “High Rate” the filters for increased capacity.
- Hydraulic issues that have existed since the plant was constructed. The original installation had the wiers set too low and during high flow rates would allow water from the pulsation chamber to back-up into the flash mix chamber. Inclined plates were broken.
- Existing water plant instrumentation, which had been in place since the plant was constructed, was outdated and inaccurate.
- The plant used chlorine as its primary disinfectant, which can lead to the development of Trihalomethanes (THMS). The Safe Water Drinking Act imposed a phased in reduction of THMs that could not be met in Chatham County without the use of Chloramines, a combination of free chlorine and ammonia that reduced THMS.
- The Water Treatment Plant Lagoon is used to collect the waste or backwash water generated by the water plant treatment operations. This lagoon discharges to Jordan Lake by pump station and the discharge is regulated by an NPDES Discharge Permit issued by NCDENR/EPA. The sludge in the lagoon had accumulated to a level that was causing the County to exceed the discharge limits of the permit.

## Recommended Solution

## Water Treatment Plant Modifications

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Improvements to the plant, which have been completed, include:

Replacement of the filter media in each of the four filter cells

Modifications to the effluent chamber were made. The weirs in the effluent chamber were also modified so that they could be adjusted to accommodate varying flow rates in the future.

Modifications to the flash mix chamber were made. The level of the flash mix chamber was raised and operable weir gates were installed.

Inclined plates that were broken were repaired or replaced. The basins were also pressure washed and concrete repairs were made to the basins.

Exposed chemical feed lines in to the filters were insulated and heat traced to prevent freezing.

All of the water plant instrumentation was replaced.

The plants ammonia feed system was replaced for the purpose of bringing Chloramines back on line.

The Lagoon was dredged removing approximately 90% of the sludge. This sludge was dewatered and hauled to an approved landfill site.

### **Current Stage of Project**

The project is complete.

# Western Transmission Mains

A continuation of the Pea Ridge transmission water main, the project consists of constructing 162,000 linear feet of water mains to serve the southwest water system from Jordan Lake Water Treatment Plant.

<b>Project Budget</b>	<b>Prior to FY 05-06</b>	<b>Current Year: FY 05-06</b>	<b>Year 1: FY 06-07</b>	<b>Year 2: FY07-08</b>	<b>Year 3: FY 08-09</b>	<b>Year 4: FY 09-10</b>	<b>Year 5: FY 10-11</b>	<b>Project Totals</b>
<b>Project Element</b>								
Construction	0	0	10,801,667	0	0	0	0	10,801,667
Contingency	0	0	1,080,166	0	0	0	0	1,080,166
Land	18,674	0	19,326	0	0	0	0	38,000
Planning	617,530	369,419	93,219	0	0	0	0	1,080,168
<b>Total Project Element</b>	<b>636,204</b>	<b>369,419</b>	<b>11,994,378</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,000,001</b>
<b>Funding Source</b>								
Installment Purchase/COPs/Bonds	636,204	369,419	11,994,378	0	0	0	0	13,000,001
<b>Total Funding Source</b>	<b>636,204</b>	<b>369,419</b>	<b>11,994,378</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>13,000,001</b>
<b>Operating Effect</b>								
Debt Service	0	0	0	869,921	869,921	869,921	869,921	3,479,684
<b>Total Operating Effect</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>869,921</b>	<b>869,921</b>	<b>869,921</b>	<b>869,921</b>	<b>3,479,684</b>

## Define Problem

The goal of Chatham County's water systems is to produce all water being consumed by Chatham County customers from the Jordan Lake Water Treatment Plant. In order for this to be feasible, the water system must have a transmission main network throughout the County. This network of mains must be of sufficient size to satisfy average and peak demands of the system and normal growth.

In order to serve the existing Southwest System and the newly formed Southwest Water District from the Jordan Lake Water Treatment Plant and eliminate the need for purchasing water from other jurisdictions, construction of water mains is necessary. In addition, once these mains have been constructed, there will be significant hydraulic improvements for existing customers.

## Recommended Solution

Construct the following:

- A booster pump station adjacent to N.C. 902, approximately .5 miles west of the intersection of N.C. 902 and Pittsboro-Goldston Road
- A 500,000-gallon elevated storage tank adjacent to Alex Cockman Road just north of the intersection of Alex Cockman and Elmer Keck Road. This tank would become the control tank for the western portions of the water system. This tank will be the source of supply for the Southwest Chatham Water System's Bonlee Tank, the Harper's Crossroads standpipe, and the Bennett standpipe.
- A 16-inch water main from the 15-501/Mt. View Church Road intersection along Johnny Shaw, Chatham Church, and Pete Roberson Roads to the intersection of Pittsboro-Moncure Road, then north along the Pittsboro Chatham Water System.
- A 12-inch main south along Pittsboro-Goldston Road from Pete Roberson Road to Mays Chapel Road.

## Western Transmission Mains

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- A 16-inch main from the N.C. 902/Alex Cockman Road north along Alex Cockman to U.S. 64.
- A 12-inch main would be constructed along U.S. 64 to the 64/Silk Hope Road and connect to a proposed eight-inch main to supply Silk Hope Elementary School.

### **Current Stage of Project**

The Board of Commissioners adopted the project ordinance for this project on May 17, 2004. Hobbs, Upchurch, and Associates completed an Engineers Report on this project in October 2004. Hobbs is currently finishing the engineering plans for the project.

### **Relation to Other Projects**

The Pea Ridge Road (Group B) water lines must be constructed first.

### **Professional Services Needed**

Detailed engineering plans and construction management will be needed.

### **Operating Impact**

Additional funds for maintenance will be needed.