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a plan for
WATER
&
SEWER

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A PLAN FOR WATER & SEWER

May 1973

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BIBLIOGRAPHIC DATA SHEET	1. Report No. MPC-SN-114	2.	3. Recipient's Accession No.
4. Title and Subtitle	A PLAN FOR WATER & SEWER		
7. Author(s)	Chatham County-Savannah Metropolitan Planning Commission		
9. Performing Organization Name and Address	Chatham County-Savannah Metropolitan Planning Commission P.O.Box 1027 - 2 East Bay Street Savannah, Georgia 31402		
12. Sponsoring Organization Name and Address	Department of Housing and Urban Development 451 Seventh Street, S.W. Washington, D.C. 20410		
15. Supplementary Notes	Supersedes: A Plan for Water and Sewer (GA.P-56) October 1968; Water and Sewer Financial Plan (GA.P-128) December 1969; Water and Sewerage Improvements Needed in 1975 in Chatham County (GA.P-129) March 1970; A Plan for Water & Sewer		
16. Abstracts	[[GA.P-154) June 1971.		
	<p>This Plan is an updated version of four (4) previous documents. It is a generalized comprehensive guide which identifies and evaluates the physical aspects of existing and future water and sewer systems in the Savannah-Chatham County Metropolitan Area. The Plan also projects the capital requirements for six (6) years and recommends a means of financing the needed improvements. Other recommendations included in this report relate to the cessation of discharging any partially treated or untreated sanitary waste into the classified streams and the upgrading of existing treatment facilities to meet pollution abatement standards.</p> <p>Note: The preparation of this report was financed in part through a comprehensive planning grant from the Department of Housing and Urban Development.</p>		
17. Key Words and Document Analysis.	17a. Descriptors		
17b. Identifiers/Open-Ended Terms	Water and Sewer Planning (problems, goals and objectives, recommendations, costs, capital program)		
17c. COSATI Field/Group			
18. Availability Statement	Chatham County-Savannah MPC P.O.Box 1027 - 2 East Bay Street Savannah, Georgia 31402	19. Security Class (This Report) UNCLASSIFIED	21. No. of Pages 86
		20. Security Class (This Page) UNCLASSIFIED	22. Price
			Price: \$3.00

a plan for
WATER
&
SEWER

1973-1985
COMPREHENSIVE WATER & SEWER PLAN
WATER & SEWER FINANCIAL PLAN
CAPITAL EXPENDITURES 1973-1979

CHATHAM COUNTY-SAVANNAH
METROPOLITAN PLANNING COMMISSION

ACKNOWLEDGEMENT

May 1973

This report was produced with the assistance of

Thomas and Hutton Engineering Company

CHATHAM COUNTY-SAVANNAH METROPOLITAN PLANNING COMMISSION

October, 1968

Updated

June, 1971 & May, 1973

The preparation of this report was financed in part through an urban planning grant from the Department of Housing and Urban Development, under the provisions of Section 701 of the Housing Act of 1954, as amended.

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CHAPTER 1

INTRODUCTION

A plan for the future development of a Water and Sewer System in Savannah and Chatham County would not be comprehensive without a discussion of the community's water pollution problem; the existing systems; and the Federal and State Water Quality requirements.

The comprehensive Water and Sewer Plan consists of an inventory and analysis of the existing systems and the improvements needed for 1985; a discussion of the financing of the construction needed; and the construction and financing needed to provide for the population expected in 1979. It also includes a proposal for the ultimate disposal of waste that would be undertaken after 1985 as part of a complete clean up of the estuaries and canals.

The plan is intended to provide the community with a sound guide for developing these needed facilities. It will be reviewed periodically and revised as needed. It will serve both as a guide for immediate action and as a vehicle for determining future needs.

Water Pollution-Man's Oldest Problem

Water is the most basic of man's natural resources. The history of man's development, life, and progress is inextricably bound to the availability of water and his use of it. Even man's evolutionary ancestors are assumed to have come from an aquatic environment.

Man's physical body is at least 70 percent water and he must replenish his cellular structure daily with new, high quality water in order to maintain a healthy biological status. A physician draws the analogy between 10 billion cells organized in a single human body (society) and a city. Both use water to maintain life and to eliminate waste.

As a resource, water is a requirement so basic to this country's existence and economy that the use of all other resources is either dependent upon a plentiful supply of water or is valueless for use and development in the absence of water. Most natural resources are depleted with use (i.e. oil, coal), but water is the only one that is renewable. Since all water supplies are basically replenished through precipitation and evaporation, water is only changed with use.

As our population increases and becomes more urbanized, and as technological demands increase, the demand for water increases at a faster rate.

While the supply of water is fixed by nature, the increase in demand has been startling. From 1900 to 1950 while U.S. population doubled, total water use, other than for power, increased four hundred percent. By 1960 it was up another 59 percent from 1950. Water needs are expected to more than double again by 1980 while population increases 45 percent. Average daily use for all purposes increased from 600 gallons per capita in 1900 to 1,100 gallons in 1950 and 1,500 in 1960. At this rate by 1980 we will be using 2,300 gallons per day for every man, woman and child.

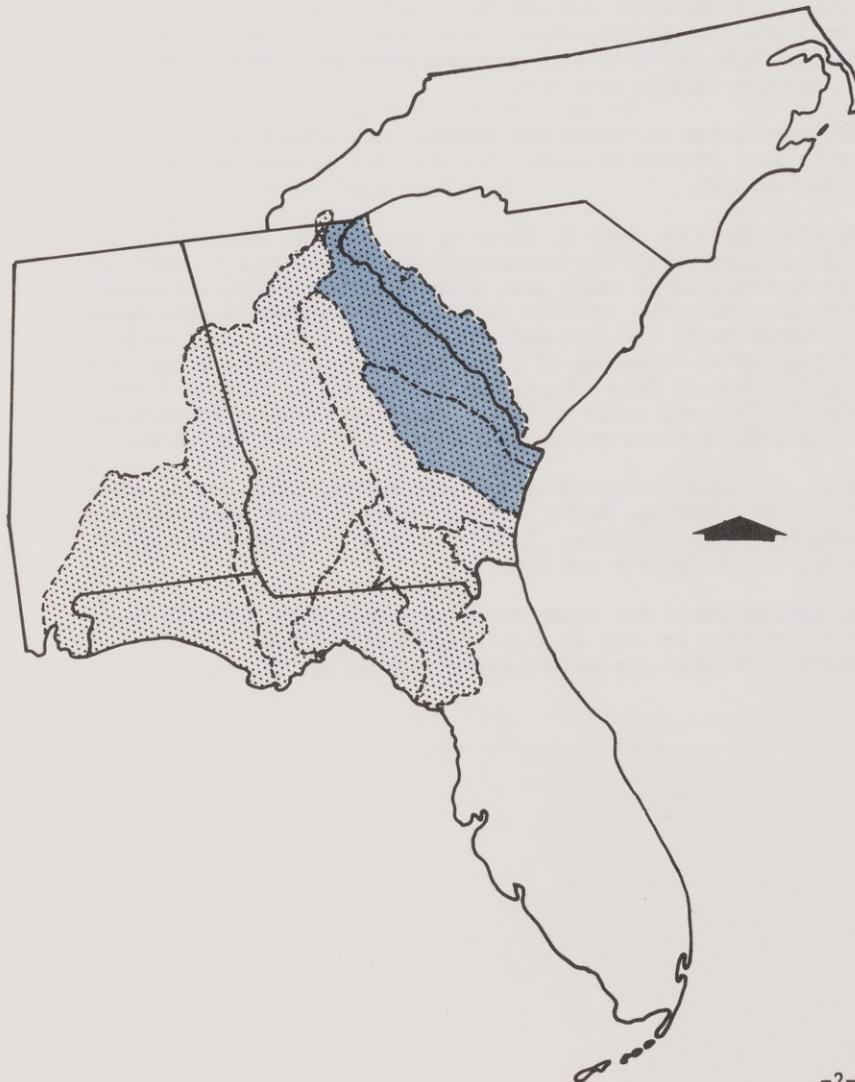
In 1963, a United States Study Commission completed an exhaustive study of the Southeast River Basins, covering eight watershed including the Savannah River. This study projects the needs of the area for the years 1975 and 2000.

Total population of the basin areas is expected to increase from almost 5 million in 1960 to over 10 million in 2000, with the proportion of urban population going from 54 to 72 percent.

Water requirements for the area should increase sharply, from 18 billion gallons per day in 1960 to over 30 billion gallons per day in 2000, the equivalent of 34.7 million acre-feet of water per year. The year 1954 was a checkpoint as the most critical drought year in the area for the past 100 years. The surface runoff available during the 1954 drought year was about 35.5 million acre-feet, and it would be possible to draft more than average quantities of ground water during a critical drought year.

SOUTHEAST RIVER BASINS

SAVANNAH - OGEECHEE



Thus, the projected requirements for water in the year 2000 would be only about 50 percent of the available surface supply during a year of average runoff, and 97 percent of the available surface supply even during a drought year equivalent to that of 1954. Table 1 gives the projections of water use in more detail. While the area of the Southeastern River Basins will continue to be well supplied with water, particular sections within the area would doubtless have to supplement their natural supply in the event of a drought.

TABLE 1

Projections of
Water Use in Southeast River Basins Area
for Years 1975 and 2000

Purpose	1960	1975	2000
		(millions of gallons per day)	
Municipal	400	670	1,450
Industrial	2,520	3,540	6,120
Waste Dilution	15,000	18,000	23,000
Agriculture	150	270	390
Total	18,070	22,480	30,960

Source: Plan for Development of the Land and Water Resources for the Southeast River Basins, U.S. Study Commission, 1963, Appx. 9, p. 3-18.

Based on the degree of urbanization expected, sewage facilities will have to increase their capacity several times over to take care of municipal population (Table 2).

Not only will sewage facilities have to be expanded; the expanding population will also want more lakes to fish and more space for water skiing, swimming and other water sports.

TABLE 2

Projected Sewage Facilities
Southeast River Basins Area

Year	Municipal Population Served	Number of Systems		Type of Treatment		
		Govt.	Total	None	Primary	Secondary
1960	2,516,000	58	375	141	96	138
1975	5,009,000	58	477	---	88	389
2000	9,089,000	58	560	---	89	471

Source: Plan for Development of the Land and Water Resources of the Southeast River Basins, U.S. Study Commission, 1963, Appx. 12 p. 2-161.

Today in the humid climate of Chatham County, the problem is not one of a lack of water, as it is in the arid or semi-arid areas of the world, but a problem of taking water for granted and wasting it with impurities.

Municipalities and industries want clean water in large quantities for survival and growth, yet the water sources are continually polluted with the discharge from their liquid wastes.

Pollution Defined

Pollution is defined as an impairment of the quality of waters by sewage or industrial waste to a degree which adversely and immeasurably affects such waters for domestic, industrial, agricultural, navigational, recreational or other beneficial use.

No water is pure. Even in its natural state it is "polluted." It carries, either dissolved or suspended, traces of every material it has recently contacted. Sources of these "natural pollutants" are the earth, vegetation, animal life, and atmosphere, plus the metabolic and chemical reaction of the various elements with each other and the water itself.

Most natural pollutants do not pose a threat to man and his water supply. It is when man, himself, introduces synthetic or man-made pollutants to the water or upsets the ecological balance so that the water cannot adequately cleanse itself, that a serious threat is posed to his water supply.

Man reduces ground cover so that water runoff is accelerated to the point of carrying all the top soil with it. Man empties his waste products, both domestic and industrial, into water until it is polluted almost beyond recovery.



Water pollution has different meanings for different people. Pollution is raw, putrified sewage. It is mixture of toxic and odoriferous chemicals such as pesticides and detergents with a temperature too high for the survival of aquatic life. Water pollution is excess aquatic plant life, and it is sedimentation which fills channels and harbors and kills fish and shellfish. It can even be radioactive resulting from mining, processing or testing.

Effects of Water Pollution

It is obvious that water pollution has significant damaging effects on man's ecological environment, his personal health and his social and economic activities. Many effects of pollution may still be unknown to man. There are indications that no remote corner of the earth is spared the effects of man's pollution.

The areas that are most obviously affected by water pollution and therefore, demand man's immediate attention are health, recreation, wildlife, and commercial and industrial activities. No food is consumed in as large a quantity or as frequently as water. Water is also used in the preparation of most of our other foodstuffs.



The effects of water pollution on health are not hard to imagine. It is well known that water is a natural environment for viruses, bacteria, and parasites. Water, very possibly, plays a part in the transmission of almost every infection or parasitic disease known.

There are literally thousands of toxic substances being discharged into water supplies. Most of these compounds are very stable such as synthetic detergents, insecticides, and herbicides. Many inorganic substances are toxic in one part per million and some in just a few parts per billion. The chronic effects of many compounds are not yet known. Many animals, including man, carry trace deposits of DDT and other substances in their body fat. The effects of many carcinogenic compounds which are found in water are still unknown.

Water-oriented recreation, whether active or passive, is the most popular form of outdoor recreation today. There are over eight million pleasure boats in use in the United States today. Skin-diving is a 100 million dollar business. Other, more common forms of water-based recreation such as fishing, swimming, and picnicking are too vast to be measured accurately.

The primary effect of water pollution and the subsequent closing of streams, lakes, and beaches to recreation has been the crowding of more people seeking recreation into less space. Recreational facilities in this country are already inadequate.

Municipal and industrial pollution have caused fish kills and damage to other marine resources. In Chatham County, the harvest of oysters, clams and other foods taken from polluted areas has been forbidden.



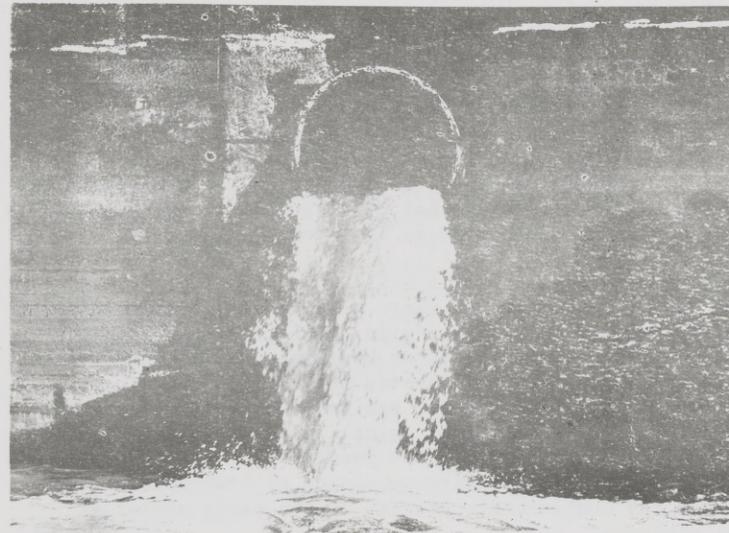
The effects of pollution on fish and aquatic life poses problems for the commercial fishing industry in this country. This is a fairly significant industry in Chatham County and commercial fisheries have suffered setbacks because of pollution.

Wildlife also suffers because of water pollution, primarily due to the destruction of essential elements in the diet of certain animals. However, water pollution has contributed directly to the death of significant numbers of wildlife, especially waterfowl.

The effects of pollution on fish and wildlife could reach a near crisis in this country. The U.S. Fish and Wildlife Service estimates that the area of fish and wildlife habitat rendered unproductive each year by pollution is greater than that created by all public agencies conducting fish and wildlife restoration programs.

The effects of water pollution on commercial and industrial activities may never be fully known. Direct costs, such as increased expenditures for waste treatment may be estimated, but the intangible cost are too difficult to calculate.

Some industries use tremendous amounts of water. The major industrial use of water is for cooling. Other uses include cleaning of products and equipment, production of steam as well as fire fighting, washing equipment and sanitation. One of the major factors in determining plant location is the availability and quality of water. In many instances water must be treated by industry before it can be used and again after it is used. This treatment, of course, greatly increases the cost of industry's most basic raw material.



Sources of Pollution

Water pollution is caused by natural and man-made sources.

Natural Sources. Although pollution due to natural causes is not the worst form of pollution, it can and does create a problem for man. Natural causes of pollution may be classified as: siltation, leaching of natural salts and seepage from irrigation.

Man-Made Pollution: The sources of man-made pollutants are municipal wastes, industrial waste and agriculture operations. Municipal wastes constitute a very significant threat to the nation's and the local area's waterways.

Ninety percent of the 5,604 communities in the United States have a population of less than 10,000 persons. Only 3 percent are cities of more than 50,000 persons, but these contribute 60 percent of the pollution. This 3 percent, about 150 cities, represents 24 million people. Seventy-five of these cities representing about 12 million people do not treat their sewage. A 1965 report by the National Association of Counties indicated raw sewage being discharged from 2,139 communities. These communities represent about 22 million people.

Local Pollution

Raw waste was formerly discharged directly into the Savannah River by the City of Savannah, Garden City, Port Wentworth and most of the industries along the river. Savannah Beach discharged an inadequately treated primary effluent. As a result of the Federal and State governments actions and an order from the Superior Court, all the municipalities and most of the industries are now constructing waste treatment facilities that will provide at least secondary treatment to any waste discharged to the river.

The discharge from storm sewers is still a source of pollution, especially in the City of Savannah where historically storm and sanitary flows are carried in a single pipe. The City now has projects underway that will separate all known sources of combined flows but it is considered impossible to discover and correct every case. The storm water itself even without sanitary waste contains a significant amount of pollutants from animal feces, rotting organic material, and the debris of urban development. At some future time, the storm water will require screening or some type of treatment to remove the contaminants carried by the early stages of storm water discharge.

Agricultural operations which pollute water are those which make use of pesticides, herbicides, and irrigation. Irrigation is a major source of pollution, but is not required for most of the local crops.

Local Water Supplies

The Savannah area obtains most of its water supply from the Ocala Limestone aquifer. This aquifer has been reported as one of the world's most productive, yet, water levels in the wells have declined more than 160 feet at the center of the cone of depression, since pumping from the aquifer began in 1885. The cone of depression, formed by a large withdrawal from a small concentrated area, is centered just west of Savannah in the industrial section. Before pumping from the aquifer began, the water level or artesian pressure was about 40 feet above sea level at Savannah. By 1963, it was slightly more than 120 feet below sea level.

A 1963 United States Geological Survey Water Supply Paper indicates that salt water is encroaching into the aquifer from two sources. Sea water is entering the aquifer in the vicinity of Port Royal Sound in the upper zones and unflushed salty water in the lower zones. The Geological Survey Report estimates that it will take 75 years for the salty waters of the lower zones to reach the center of the cone, and about 400 years before salt water in upper zones reach the cone of depression, based on the 1963 pumping rate of 62 million gallons per day.

Both types of contamination are caused by the lowering of water levels in the Savannah area and a subsequent reversal of the hydraulic gradient east and northeast of Savannah. This is a direct result of the large ground-water withdrawal from the cone of depression. The Geological Survey Paper suggested the relocation of the present cone of depression to a point 15 to 20 miles west of Savannah and control of areawide withdrawals to cause a broadening of the cone to the west and a rise in the water table in the present cone. Since ground-water is the major source of Savannah's water supply, attention in the future will be required toward saving and controlling ground-water use, rather than the continued expansion of this resource. Total water resources, however, are adequate to meet present and future water requirements.

Service

The major local distribution problem today is one of providing all the citizens of Chatham County with adequate water services. Some parts of the county still lack water services and other areas, presently served by some of the smaller water systems, are not supplied with adequate water services. A total of 52 municipal or community water systems exists in Chatham County. This figure in itself indicates a lack of coordination between the water systems and the problem of supplying the citizens with adequate water facilities.

These 52 water systems were built to serve areas where early development started and were later expanded to match the growth of the original settlements. These systems are owned by various municipalities, corporations and individuals. Each owner has been understandably interested in the area served by his system, with the result that there are many fringe areas where adequate water service is not available. Indeed, many of the existing systems are not adequate when the water systems are measured by the requirements for fire protection and domestic supply. Thus, the 1970 population of 187,816 is not adequately served, so major revisions of the water and sewer systems will be necessary to serve the 220,500 to 240,000 people expected in 1985.

A water system has two functions. It must provide sufficient, safe water at adequate pressure to supply its customers with water for cooking, bathing, lawn care, and other domestic uses. This is a relatively modest amount-usually considered 100 gallons per day per capita.

A more demanding function is to provide sufficient water to suppress a serious fire. A minimum of 500 gallons per minute is regarded as necessary for this fire protection, and fire insurance companies recognize this by adjusting the insurance rates where such flows are available.

To maintain the independence of the 52 existing systems while providing adequate service to all citizens would be hopelessly complicated.

A program for adequate service can be properly developed only by a single constituted authority or agency following detailed engineering studies and careful consideration of the physical, economic, legal and public policy merits and disadvantages. The two phases of the Water and Sewer Study will provide the information and recommendations to initiate such a program.



Sewage Treatment

The installation of sewers to serve residents in developed areas is only the beginning of the sanitation cycle. The whole problem of water pollution-the despoliation of streams and coastal waters by discharges of wastes-stems from the water carriage system of sewage disposal. The function of a sewer system is to remove from man's habitat the physiological wastes of his existence. Unfortunately, the great benefits which sewers offer sewage producers may become a serious sanitation hazard to their neighbors. Wastes cannot be destroyed by the simple expedient of transporting them away from their point of origin. They retain their "power for evil" regardless of where they are finally discharged.

The answer to the pollution problem must include sewage treatment-the removal or modification of contaminating substances in the sewage flow in man-made facilities which utilize natural, mechanical and biological processes. The percentages of wastes or pollutants in the vast amounts of clean water which make up sewage are extremely small; yet, the potency of these wastes is so great that the disposal of these used liquids into water courses adversely affects the usefulness of the streams for the purposes for which they are intended. Thus, pollution control is a practical, realistic matter of community survival and prosperity, not an academic effort merely to preserve beauty, aesthetics, and pride, important as these ideals may be.

In broad terms, sewage contains four types of contaminants:

Coarse solids and debris-which are removed by screens and grit removal facilities.

Finer suspended solids-which are removed by clarification in settling tanks.

Dissolved organic matter and colloidal matter-which can be removed or modified by the oxidation process, either biological such as in trickling filters or by introducing air mechanically.

Bacteria, many of fecal origin-which are partially removed by standard treatment processes, and then disinfected by chlorination.

There are many types of treatment processes, each one having characteristics that make the selection of the best type for the specific conditions one of the designer's most important functions.

In rural areas, cesspools, a simple type of treatment, is sometimes used. These are holes in the ground with porous sides. The solids are retained in the pits and the liquid is absorbed into the surrounding soil. A more sophisticated arrangement of the cesspool is the septic tank in which the liquid is carried through porous pipes to an adjacent tile field where it is absorbed by the soil. These methods are used in rural areas where the ratio of sewage to the capacity of the soil to absorb it is very low.

As the density of development increases the amount of sewage increases while the absorbing capacity of the soil decreases due to the construction of impervious surfaces like paving and buildings. The capacity of the soil to accept sewage is limited in low areas where the ground water is within a few feet of the surface. The sewage mixes with the ground water and drains under the surface to the nearby ditches and canals. Obviously, high concentrations of sewage that are the result of people living close together produce intolerable amounts of pollution in the receiving water courses. In many cases the results of this concentration do not show up on the contributor's property, but on the lower land to which his property drains.

Community treatment facilities are frequently classified as giving primary, secondary or tertiary treatment.

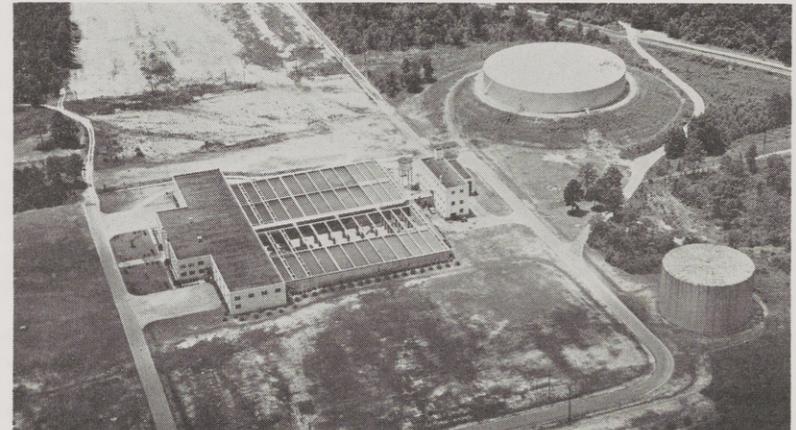
Primary treatment generally consists of a clarifier in which the sewage flows at a low velocity so that many of the solids settle and are placed in a digester compartment to break down into sludge. This type of plant removes about 50 percent of the contaminants.

Secondary treatment takes the clarified effluent from the primary portion and adds oxygen by biological oxidation in a filter, or by aerators to remove the dissolved organic matter. The effluent then flows through a final clarifier. This type of plant removes about 80 to 90 percent of the contaminants.

Tertiary treatment provides additional treatment to the effluent from the second clarifier either by filtering or by stabilizing in a polishing pond. This type of treatment removes practically 100 percent of the carbonaceous organic material and solids.

In addition to the solids and carbonaceous organic in waste, there are viruses, bacteria and nutrients that are soluble and not removed by ordinary treatment. By disinfecting the effluent with chlorine, the pathogenic viruses and bacteria can be suppressed. Nitrogen and phosphate remain in various compounds and strengths in effluents from conventional treatment facilities. These are nutrients that contribute to the growth of plant life. Thus the effluent from a treatment facility causes an increase in the growth of algae when it is discharged into an estuary or slow moving stream. When this algae dies it consumes oxygen and degrades the receiving water even though the treatment facility has removed all solids and oxygen consuming carbonaceous organics. Thus at locations where the effluent will be discharged into a relatively small estuary, the nitrogen and phosphate should be removed by chemical precipitation.

Waste Stabilization Ponds provide oxygenation without the use of mechanical equipment. These ponds provide storage periods of approximately 100 days in which algae and sunlight produce sufficient oxygen to stabilize the waste. The land requirements of 1 acre per 200 persons make these facilities impractical for large populations.



A Complete System

A water and sewerage system when operated in a desired manner is in reality "one" system, since liquid sewage is produced only where water is available and in direct proportion to the availability of water. A complete system is not limited to the pipe line carrying the water to the consumer. Each half of

the system is connected indirectly to the plumbing and other facilities within the consumer's establishments.

Although both water and sewer services consist of pipe laid underground, sewers are generally more expensive than water lines. They must be larger to carry the equivalent amounts of liquid and depend mainly upon the force of gravity to give them their capacity usually without benefit of added pressure from pumps. In addition, sewer lines frequently require deeper excavation to lay the pipes in order to provide the desired velocity or they must resort to the use of force mains and lift stations.

Sewage, if not properly treated and disposed of, can contaminate anything it comes in contact with including wells and surface waters. This waste becomes additionally undesirable because of the odor nuisance and the creation of filthy and obnoxious conditions. The treatment of sewerage must be governed by the dictates of economy and public health. The degree of treatment required usually depends upon the conditions in the area of disposal and those areas down stream. In Chatham County, the classification of the local streams determines the degree of treatment the effluent must receive before it may be discharged into the waterways. The majority of the local streams are classified as recreational streams and require tertiary or completed treatment of all sewage effluents entering them. None of the existing sewage systems in Chatham County conform to this requirement at the present time, but as improvements are made to existing facilities or new ones are built, they will be required to meet this requirement in the future.

The overall planning of treatment plants requires that a few large plants rather than many smaller plants be constructed because of the problems in operating treatment plants and the economics involved. Chatham County's relatively flat terrain, low elevation, numerous waterways, marsh areas, fragmentation of buildable areas and age of development presents problems in this aspect of water and sewer planning.

The Water and Sewer Plan has been designed for the ultimate development of the entire service area even though it sometimes is separated by these existing barriers. The policy has sometimes justified the oversizing of the initial facilities in order to provide for the capacity of future development and prevent the reoccurrence of the present pollution problems.

Purpose of the Plan

Savannah and Chatham County's potential development is almost unlimited, provided that deterrents to development such as water pollution do not stagnate the future. As the population increases the demand for water and sewerage services and facilities will also increase. Plans made now will help provide for these services and facilities and insure their correct development.

As a guideline for the Water and Sewer Plan, various community goals have been used. These goals are basic in their nature but do indicate the problems that exist today and provide a start toward a future free of the major problems related to water distribution and sewage treatment.

The goals are:

Correct existing problems such as: low water pressures, contamination from septic tank failures raw sewage discharges into the rivers and streams frequent breakdowns in water services, individual wells and disposal systems in developed areas.

Prevent future pollution of rivers and streams in Chatham County;

Provide all residents with an equal quality of water and sewer services;

Insure that adequate water supply will be available for fire protection;

Make water and sewer services available to industrial areas;

Eliminate the blight that occurs when developments are served by sub-standard or no water and sewer facilities;

Prevent the problems of sub-standard systems because adequate provisions are not made in a water and sewer system to accommodate growth and development;

Provide a basis for scheduling and financing water and sewer projects;

Take advantage of funds available from federal and state agencies for sewerage treatment and basic water and sewer facilities;

Protect the present and future sources of water supply; and

Use the Water and Sewer Plan as a guide to land use planning and development controls.

Water Quality Control

Pollution does not respect state boundaries any more than it does municipal boundaries. Recently the interstate approach has been increased because of the limited results that local or state governments have been able to produce.

Federal level interest in water pollution is stimulated by many factors. Some of these are: (1) the nation's water supply is relatively limited, (2) the water supply is distributed unevenly both geographically and seasonally, (3) most of the surface and ground water sources are multistate in character, (4) much water used in the United States has actually been used before in other states, and (5) water pollution interferes with many interstate activities.

The Water Pollution Control Act gives the Federal Government authority to enforce water pollution abatement of interstate or navigable waters. This enforcement action can be instigated by a state government, a water pollution control agency, or a municipality.

The Environmental Protection Agency administers the Water Pollution Control activities of the Federal Government.

Water Quality Control Act. The Federal Water Pollution Control Act Amendments of 1972 provide rules and regulations for the awarding of grants to assist with the construction of waste treatment works. These amendments and the Act provide for grants of 75% of the construction cost of treatment works and collector sewers in developed areas. It also provides that any sewerage construction participating in federal grants must conform to an overall Regional sewer plan.

The Amendments provide for the operation, user charges, and other conditions upon which grants will be made.

The State Department of Natural Resources, Environmental Protection Division, administers the Federal Water Pollution Control Act and determines who gets the grants. They have established water use and quality standards for all Georgia waters. This Division certifies treatment plant operators and monitors the operation of plants. Any proposed sewer projects must be submitted to them in accordance with the following guidelines:

1. Plans and specifications must be prepared in accordance with the rules and regulations employed by the Division.
2. All submittals and correspondence should be submitted through the applicable political subdivision.
3. The political subdivision must be willing to accept the proposed system for operation and maintenance.
4. The political subdivision must certify that their current system has capacity to provide adequate treatment for the proposed additional waste load.

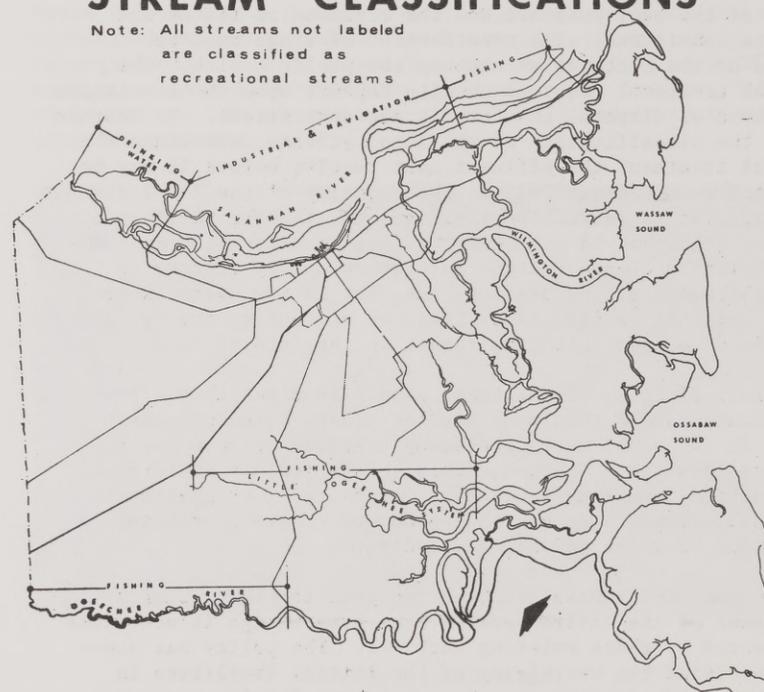
5. A political subdivision with in-house sanitary engineering capability, must review and approve the plans and specifications.

The State Department of Natural Resources has classified the major streams such as the Ogeechee, Little Ogeechee and Savannah Rivers and has left the small or minor streams unclassified until the necessary field work can be accomplished.

The local governments have the power to make any stream more restrictive but not less restrictive than the classification given it by the State. The recommendation is that all the local, small or minor streams be classified as "recreational streams" because of their usage or potential use for recreational purposes.

STREAM CLASSIFICATIONS

Note: All streams not labeled are classified as recreational streams



Based on the above classification all the streams in Chatham County are subject to the requirements of the State Department of Natural Resources. In addition, the United States Public Health Service because of its responsibility for the sanitary quality of raw oysters shipped in interstate commerce has an interest in Chatham County streams and estuaries. Therefore, these agencies have a

voice in the quality and location of sewage discharge into the streams. The citizens of the community have an even more relevant interest in the conditions of the streams as scenic, recreational and resource potentials and must take steps to stop the pollution of these streams. As a portion of the community's effort and as a base for further community planning, the comprehensive Water and Sewer Plan contemplated and recommends the eventual cessation of discharging any partially treated or untreated sanitary waste into recreational streams.



Program Sequence

The Pollution Abatement Program of the City of Savannah that is now under construction will be completed about the end of 1974. It will provide a treatment plant on President Street that is capable of providing secondary treatment to a 20 MGD flow. The collector lines leading to this plant that are now under construction are:

Kayton Interceptor System
Bacon Park Diversion

Other collectors leading to this plant are planned but not yet under construction. They are:

York Lane Interceptor,
Paulsen Street Interceptor,
West Side Industrial Interceptor,
Hopkins-Victory Drive Separation System, and
River Street Interceptor System.

Future collectors leading to this plant are required to complete the system. They are:

Thunderbolt pumping station and force main,
Causton Bluff pumping station and force main, and
Isle of Hope pumping station and force main to Bacon Park.

The City of Port Wentworth now has under construction a pumping system that will deliver the City's waste to a treatment facility owned and operated by Continental Can Company.

The City of Garden City now has under construction a sewage treatment facility that will provide secondary treatment for the City's waste, plus that from the Georgia Ports Authority, Garden City Terminals, National Gypsum Company, G.A.F. and Chatham City.

The City of Savannah Beach now has under construction a sewage treatment facility that will provide secondary treatment to the City's waste including that of summer visitors. An additional project consisting of the replacement of sewage pumping stations, force mains, and interceptor sewers is now being designed and will be constructed during the latter part of 1973 unless federal funding is withheld.

The Regents of the State Board of Education who operate the Ocean Science Center of the Atlantic (OSCA) on Skidaway Island have recently constructed a 4 acre Waste Stabilization Pond that will take care of their flow plus the flow from the proposed State Park until a permanent treatment facility is built.

The City of Savannah during 1972 has completed an expansion of the Wilmington Island Treatment Plant to a capacity of 3,600 persons (.36 MGD); replacement of the Travis Field Treatment Plant to a capacity of 10,000 persons (1 MGD); and enlargement of the Windsor Forest Treatment facility to 30,000 persons (3MGD).

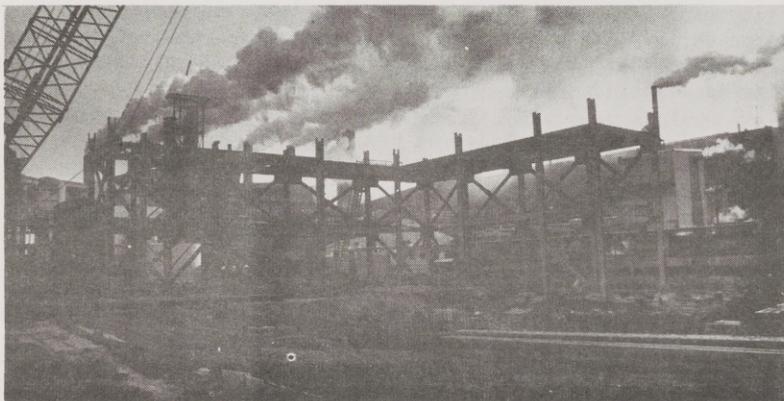
The City of Savannah has applied for federal grants to expand the Wilshire Estates treatment facility to 20,000 persons (2 MGD); and the Cloverdale treatment facility to 4,000 persons (.4 MGD). Federal funding of these two projects is expected in 1973-74 so they could be completed by the end of 1974.

The City of Savannah now has under contract the construction of a pumping system that will pump the treated effluent from the Windsor Forest and Wilshire Estates facilities to the Springfield Canal and thence to the Savannah River.

At "Gateway Savannah", (the Interchange between I-95 and Abercorn Street) a collection system and treatment facility was completed in 1972 that will provide disposal of waste from the motels, restaurants and service stations being constructed. These facilities are privately owned and operated.

All of the industries that formerly discharged into the Savannah River, except American Cyanamid Company have installed treatment facilities that reduce their discharges to acceptable quality. The American Cyanamid Company's proposal for their waste treatment scheme is now the subject of court action and any comments on it are not appropriate until the case is settled.

Thus, the community has made significant progress in protecting the surrounding waters during the past two years. This comprehensive Water and Sewer Plan therefore addresses itself to the work that must be done to provide for disposal from developed areas not having adequate treatment facilities, and for areas expected to be developed by 1985.



Major Recommendations

The major recommendations of the comprehensive Water and Sewer Plan include:

Sewerage:

1. The construction of a sewage collection system in Woodlawn, Sharon Park, and Central Junction and pumping the waste to the Travis Field treatment facility.
2. The construction of a sewage collection system in Bloomingdale and pumping the waste to the Pooler treatment facility.
3. Expansion of the Pooler treatment facility to accommodate Bloomingdale and the expected development at Interstate I-95 and U. S. 80. *

4. The construction of a treatment facility in Georgetown that will ultimately treat the waste from Ogeechee Farms and Larchmont Estates.
5. Expansion of the Cloverdale treatment facility to provide capacity for the area east of Garrard Avenue, Pulaski Park, Tremont Park, the area along Highway 17, Liberty City, Riverdale, and Summerside.
6. Construction of a sewage collection system in Thunderbolt and a pumping system to discharge into the President Street facility.
7. Construction of a sewage collection system in Causton Bluff and a pumping system to discharge into the President Street treatment facility.
8. Construction of a sewage collection and disposal system to serve the developed areas of Montgomery.
9. Construction of a sewage collection system in Isle of Hope, the area west of the Herb River, and Sand Fly, and a pumping system to discharge the waste to the Bacon Park pumping station and thence to the President Street treatment facility.
10. Construction of a treatment facility on Whitemarsh Island and pumping systems to this facility from Bradley Point and Otland Island.
11. Construction of a treatment facility on Talahi Island with a collection system to the developed areas.
12. Extend the collection system on Wilmington Island to serve the developing areas. Abandon the Islandwood treatment plant and expand the Wilmington Park treatment facility to accommodate the increased flows.
13. Construct a treatment facility and Interceptors on Skidaway Island that will provide disposal of the waste from OSCA, the State Park, Green Island and all the land on Skidaway.
14. Replace defective portions of the collection system at Savannah Beach.
15. Complete the four interceptor systems leading to the President Street plant, and complete the Hopkins-Victory Drive Separation System in the City of Savannah.
16. The ultimate goal is to eliminate the discharge of any waste, raw or treated, into estuaries or to Canals flowing through inhabited areas. This goal is unlikely to be reached by 1985 because of the cost involved and the fact

that it will also be necessary to reduce pollution reaching the canals from surface runoff of storm drainage. The solution, insofar as sanitary waste is concerned is to pump all treated effluent to the Savannah River or to spray it on turfed areas where the microorganisms in the soil can utilize it.

Water:

1. Make physical connections between the Port Wentworth-Garden City water systems to provide mutual support and storage capacity.
2. Make physical connections between Pooler and Bloomingdale water systems and construct a common elevated water storage tank to provide adequate fire flow.
3. Construct a water system in the Isle of Hope area that will provide fire protection and connect it to the City of Savannah water system at Sand Fly to provide mutual support.
4. Construct a water system in the Woodlawn, Sharon Park, Central Junction area.
5. Construct a water system on Skidaway Island to serve the residential areas and connect it to the OSCA water system.
6. Construct a water system in Georgetown.
7. Extend the City of Savannah Water System to serve Causton Bluff, Tremont Park, Pulaski Park, Summerside, and the expansion of Wilmington Park.
8. Construct a public water system that will serve White-marsh, Oatland Island and Bradley Point.
9. Construct a public water system on Talahi Island and connect it to the Wilmington Island system.
10. Upgrade all public water systems to provide fire flows recommended by Southeastern Fire Underwriters.
11. Locate wells 2,000 ft. apart and limit their production to 1,000 GPM.

General:

1. The establishment of a single operating agency to assume the responsibility for operating all the water and sewer systems in the County under one set of standards. This agency could hire the necessary personnel to operate the complicated facilities and provide laboratory and maintenance supervision to maintain the systems at their maximum quality and efficiency. The agency should have the authority to issue revenue bonds, levy water and sewer charges, and acquire existing systems and facilities for incorporation into an overall County system.
2. The development of the community should be on a long-range programmed basis. The Water and Sewer Plan is an integral part of such a planning program to provide some guidelines for the growth of the County for a population of 220,500 to 240,000 by the year 1985.
3. The projected population and economic data used in this study gives some idea of the dimension of the problem and provides a base which can be used to start the necessary corrective steps to prevent future problems related to the community's water and sewer program.
4. The Plan will also serve the community as a foundation to build upon in reviewing local applications for Federal grants for assistance in the construction of water and sewer lines and treatment facilities.
5. Three major objectives on the Long-Range Plan are:
 1. Complete removal of solids and sterilization of any waste discharged into recreational streams;
 2. An adequate water system to provide uniform water supply for all domestic use and fire protection;
 3. Establishment of a single agency to administer all water and sewer systems.

The proposed Water and Sewer Plan is based upon the expectation that development will take place in areas that will have good access to other parts of the community, and that schools and other necessary public facilities will be part of the development of the area.

Water, sewers, roads, schools, and public facilities are interdependent in a well developed community. The road system because of land acquisition, is the most difficult to achieve. In Chatham County, the road pattern is well established and, therefore, the water and sewers are projected to coordinate with this system.

To a large extent, the construction of improvements and extensions is limited by the capacity of the systems to finance the cost of this construction. It is, therefore, necessary that decisions be made quickly about the type of agency that will be responsible for the water and sewer systems in the County, and the rate structure that will be required to amortize the cost of constructing the proposed systems. After this is done, a priority can be established whereby the most urgent portions of the work can be undertaken in approximately six-year increments, based upon the revenue that can be expected to pay for them.

Public Awareness and Responsibility

The effectiveness of the overall water pollution abatement program depends upon the acceptance and interest of the citizens it effects. The public must be informed and made fully aware of the increasing cost of pure water which can no longer be taken for granted. The preliminary cost estimates at the end of this report are provided to indicate Chatham County's cost for pure water.

The Federal Government has recognized the necessity of public involvement. The Water Quality Act of 1965 provides that the states shall hold public hearings prior to the adoption of water quality standards. This law clearly established the role of the private citizen as a participant in the decision making process. It is extremely important that citizens be involved in this process.

The Public must be made aware of the power it has to stimulate and affect pollution control and abatement over both private industry and local municipalities as well as the State and Federal governments. This information and education program can be accomplished through the communications media, interest groups, and other local institutions and organizations.

Public interest and involvement are essential to the stimulation and successful implementation of water pollution abatement in Chatham County.



CHAPTER II

The Plan - 1985

The work now under construction is considered to be existing in so far as this report is concerned. Therefore, this plan is devoted to the new work that must be started to adequately serve the community.

The proposed improvements to the water and sanitary sewer systems are shown on the maps in this report. The areas served by water are not identical with those served by sewers because the water system can be easily extended by additional wells, tanks and distribution lines to match development, whereas sewers are located by topography and receiving streams. It is, therefore, possible to show a water system that is adequate for the projected 1985 land use, but the sanitary sewer system must be located and sized for the ultimate development of the area without regard to the date this development is reached. Thus, there will be sewers going through undeveloped areas to serve potential developed areas beyond. The maps, therefore, represent the proposed water system in 1985, and the proposed sewer system when the service areas are developed. Large 1"-400' scale maps which give a detailed layout of the plans are also on file at the Chatham County - Savannah Metropolitan Planning Commission office.

Existing Systems

Most of the water systems in the County do not provide adequate fire protection as measured by the National Board of Fire Underwriters' criteria. The central portion of Savannah, Thunderbolt and Savannah Beach meet National Board of Fire Underwriters' criteria, but the rest of the systems need improvements ranging from minor to complete replacement.

Exclusive of Hunter Army Airfield and the Savannah Industrial and Domestic Water Supply System, there are 50 water systems in the County, and only 6 of them include any sanitary sewage treatment at all.

Pooler, Garden Acres Estates, Pine Forest and Larchmont have waste stabilization ponds that provide adequate treatment to their small service areas which now contain approximately 2,177 people. The City of Savannah now operates seven treatment facilities with the following estimated capacities:

<u>System</u>	<u>Population Capacity</u>	<u>Type of Treatment</u>
Wilshire Pond	7,000 persons	Secondary
Windsor Forest Pond	30,000 persons	Secondary
Cloverdale Pond	2,800 persons	Secondary
President St. Treatment Plant	200,000 persons	Secondary
Islandwood Treatment Plant	600 persons	Secondary
Wilmington Park Treatment Plant	3,600 persons	Secondary
Travis Field Treatment Plant	<u>10,000 persons</u>	Secondary
Total	254,000 persons	Secondary

Thus the City of Savannah has adequate overall capacity to treat the waste from the population expecting to contribute to its facilities in 1985. However, the location of the population is such that some of the facilities are undersized while others have surplus capacity. Therefore, the Wilshire Estates and Cloverdale facilities must be enlarged, and the Islandwood facility should be abandoned and its waste pumped to Wilmington Park, which must also be enlarged. Additional collectors and interceptors must be constructed to bring the waste to the treatment facilities.

Table 3
Municipal Sewerage Systems and
Type of Treatment

<u>Name of Municipality</u>	<u>No. of Sewerage Systems</u>	<u>Type of Treatment</u>
Savannah	7	7 Secondary
Garden City	1	1 Secondary
Port Wentworth	1	1 Secondary
Savannah Beach	1	1 Secondary
Pooler	1	1 Secondary
Thunderbolt	0	Septic Tanks & Raw Sewage discharged into River
Vernonburg	0	Septic Tanks
Bloomington	0	Septic Tanks

Water

The following is a discussion of the existing water systems that could be incorporated into a county wide water system, and the improvements that will be necessary to serve the 1985 population.

City of Savannah Systems

The artesian water systems owned and operated by the City of Savannah serve nearly all developed areas within the city limits and some of the residential areas outside the City. An industrial water system providing surface water to industries is owned and operated by a commission created by the City.

Artesian Systems. The City of Savannah's water system consists of a series of 23 artesian wells which produce over 23 MGD of water to almost 80 percent of the population in Chatham County. The 1970 population within the city limits was 118,349. The 1985 population is projected to be 115,680. It is estimated that approximately 50,000 people outside the present city limits will be served by the City's water system in 1985; therefore, the City's water system will serve an estimated population of less than 200,000. The National Board of Fire Underwriters' formula gives a fire draft of 12,383 gpm for a 200,000 population.

The City now has 17 wells in its main system. These wells have a total production of 32,510 gpm so the overall capacity is adequate. The area south of the City was previously dependent upon the distribution system to get water to them. However, a recently constructed 1,000 gpm well in Windsor Forest next to the elevated storage tank has considerably increased

the water capacity on the southside. A 12 inch water line along Abercorn Street to Tibet has further increased the water capacity on the southside. At the present time the area south of Stephenson Avenue depends upon:

Well No. 6	1,220 gpm
Well No. 13	2,000 gpm
Well No. 14	700 gpm
Well No. 15	500 gpm
Well No. 17	<u>1,000 gpm</u>
Total	5,420 gpm

The 1970 population in Census Tracts 40 and 42, in the southern area not now served by City Water was estimated to be 17,078. The National Board of Fire Underwriters' formula requires a fire draft of 4,439 gpm for this population. There is a 500,000 gallon elevated storage tank in Windsor Forest so the water supply is adequate for present conditions.

The 1985 population for Census Tracts 40 and 42 is projected to be 35,280 and the National Board of Fire Underwriters' formula requires a fire draft of 5,900 gpm for this population. Because much of the distribution system has been built with 6 and 8 inch water lines, it will be necessary to spread the supply and storage structures through the southern areas to insure delivery of adequate water at each point. In determining improvements in this area, segments of the area have been considered as self-sufficient units. This will require additional storage and wells, so that the sum of the needs in this area will exceed the 4,439 gpm that would have been required if there was a better distribution network. An additional 1,000 gpm will, therefore, be necessary.

The same condition exists in the area west of the City. Considering an area generally bounded by: Lynes Parkway on the south; Seaboard Yards on the west; Louisville Road on the north; and, Meding Street on the east.

In the Cloverdale-Silk Hope area, there is a potential population of 47,280 persons. The National Board of Fire Underwriters' formula requires 8,303 gpm. There is estimated to be 5,358 gpm available from City wells 2, 3, 4 and 10. Thus, there is a deficit of 2,945 gpm in this area. It is recommended that this deficit be met by a new well, or wells, producing 1,250 gpm and a 500,000 gallon elevated storage tank.

The City also owns two isolated water systems: Travis Field serving industrial, residential and airport facilities, and the Wilmington Park system serving residential areas. The Travis Field system consist of: Well No. 17, a 500 gpm well, and Well No. 19, a 600 gpm well, both of which pump into a 150,000 gallon ground storage tank; and 2 booster pumps with a combined capacity of 1,000 gpm that transfers it into the distribution system. Well No. 18 has a capacity of 500 gpm and is standby source that operates on a pressure switch to provide additional water when necessary.



WATER SERVICE AREAS



1. CITY OF SAVANNAH
2. SAVANNAH BEACH
3. WILMINGTON ISLAND
4. SKIDAWAY ISLAND
5. ISLE OF HOPE
6. WOODLAWN
7. SILK HOPE
8. MONTGOMERY
9. GEORGETOWN
10. GATEWAY SAVANNAH
11. THUNDERBOLT
12. OATLAND
13. OGEECHEE FARMS
14. BURNSIDE ISLAND
RIO VISTA
VERNON VIEW
15. SPANISH HAMMOCK
16. WHITEMARSH-BRADLEY POINT
17. ISLE OF HOPE
18. POOLER-BLOOMINGDALE
19. GARDEN CITY-PORT WENTWORTH
20. PINE FOREST
21. LARCHMONT
22. HUNTER ARMY AIRFIELD

The demand at Travis Field fluctuates widely. The constant usage is presently limited to the terminal and associated buildings and the Grumman Aircraft Engineering Company plant. During summer encampment of Air National Guard units at Travis Field, the domestic demand increases. However, the domestic demand has never exceeded 500 gpm, and the fire flow of 1,000 gpm is adequate for the sprinkler system. The water system at Travis Field is, therefore, considered adequate.

Solicitation of industries to locate in the Travis Field Industrial Park may make future improvements necessary, if industries using large quantities of water locate there, and it is not recommended that expansion be made until more is known of their requirements.

(Wilmington Park is discussed later with reference to Talahi Island)

In the 1972 session of the Georgia Assembly, a law was passed making communities of more than 5,000 fluoridate the public water supply unless a referendum was held in which the citizens voted against it. The Medical and Dental professions in the City of Savannah are generally in favor of fluoridation, so it is expected that it will be provided in Savannah. Garden City has a population greater than 6,000 so it may be required there also.

Savannah Industrial and Domestic Water System. The City of Savannah, through its operating agency, the Industrial and Domestic Water Supply Commission, owns a water supply and distribution system to furnish surface water to industrial users. This system was conceived and built to eliminate ground water as a source of supply because of the gradual lowering of the water table and the relative hardness of ground water compared with a surface supply for industrial users.

The system consists of a raw water intake on Abercorn Creek with a capacity of 51 mgd. The filtration plant at Cherokee Hill treats and filters the water and has a capacity of 50 mgd. It includes ground storage tanks with a capacity of 14.5 million gallons of finished water. The water is distributed to industries along the Savannah River from Continental Can Company to American Cyanamid Company on a contract and non-contract basis.

The Ground Water Act of 1972 by the Georgia General Assembly gave the Department of Natural Resources control over wells producing more than 100,000 GPD drilled into the aquifer. The effect of this Act is expected to make it more difficult to get permission to drill wells for industrial water, so the use of surface water is expected to increase. This system is operated and expanded by revenues from the industries served, so it is not considered an obligation of the City of Savannah.

Garden City-Woodlawn-Port Wentworth

The proximity of Port Wentworth to Garden City plus the likely development of the lands between these communities indicate that the water systems should be combined for efficient operation even though the citizens may prefer to maintain independent political boundaries. The combined population of 10,905 for Garden City and Port Wentworth will require 3,540 gpm.

Garden City. The Garden City water system presently consists of three wells totaling 1,800 gpm and a 65,000 gallon elevated tank. The total capacity of the existing system is 2,015 gpm and is inadequate for the present population according to the National Board of Fire Underwriters' Standards which requires 2,620 gpm.

It is estimated that in 1985 the population will reach 6,700. To serve this increase, the water system must be expanded to meet the fire and domestic demands. Water lines must be installed in new areas and existing lines looped to balance pressures in the system. A new 200,000 gallon elevated tank would be required and a 450 gpm well and pump installed to meet the requirements of the increased population by 1985. The storage and supply improvements will add 790 gpm to provide the adequate quantity for 6,700 persons.

Woodlawn, Central Junction, Sharon Park. The Woodlawn, Central Junction, Sharon Park area is isolated by railroads so the water system in this area should have an independent source of water and storage. Woodlawn and the surrounding area have a present population of approximately 1,580 persons. This is expected to increase to 2,600 by 1985. A 200,000 gallon elevated tank, a well having a capacity of 500 GPM and water lines large enough to serve fire hydrants through the area are recommended.

Woodlawn is presently served by private water system with 2 small wells, two-3,000 gallon pneumatic tanks, and a distribution system with lines less than 6 inches in diameter. There are fire hydrants in the system but the pumps and water lines will not deliver water in sufficient quantity to produce the water that would be required for adequate fire protection.

Port Wentworth. The existing water system consist of two wells totaling 1,000 gpm., and a 55,000 gallon elevated tank which is badly corroded. The total capacity of the system is 1,185 gpm which is adequate for the present size and population of Port Went-

worth. The National Board of Fire Underwriters recommends 2,000 gpm for a population of 3,905 persons.

It is estimated that the population will increase to 4,205 in 1985. To provide for the 2,100 gpm required for this population, a new 200,000 gallon elevated tank would be needed and a new 500 gpm well and pump installed. Extensions of the present system in areas of projected growth, with large pipe storage and supply improvements will add 1,200 gpm to the system to provide for the growth to 4,205 persons in 1985.

Savannah Beach

The existing water system, consisting of four wells and a 100,000 gallon elevated storage tank, provides a quantity of 3,023 gpm. This is more than adequate for the estimated existing population of 1,782 persons. By 1985, the population is expected to increase to an estimated 1,987 persons. The National Board of Fire Underwriters recommends that a quantity of 2,000 gpm be provided to satisfy the fire and domestic demands of this population. The excess capacity is desirable inasmuch as the maximum consumption fluctuates greatly with the seasonal variations in population and transients.

It is recommended that additional water lines of large size be laid in the western areas of the island to provide adequate fire and domestic service.

Pooler-Garden Acres Estates-Bloomingdale.

Pooler, Garden Acres Estates and Bloomingdale are so near to each other it is recommended that the three water systems be combined as a single operating utility. This would give a service area containing approximately 5,200 people. The existing facilities in Pooler and Bloomingdale have a capacity of 1,150 gpm. Therefore, a new 1,000 gpm well, a 300,000 gallon elevated storage tank, a 12 inch pipe between Pooler and Garden Acres Estates would provide adequate service at less capital cost.

Pooler. The present population is estimated to be 1,517 persons and is served by a water system of 550 gpm consisting of a 500 gpm well and a 60,000 gallon elevated tank.

Interstate Highway I-95 will intersect U. S. Highway 80 just east of Pooler. It is expected that considerable tourist oriented development will take place at this interchange. The domestic demand and fire protection for 5 or 6 motels alone will require about 2,000 gpm. The new 300,000 gallon elevated storage tank between Pooler and Bloomingdale with a new 1,000 gpm well at the tank, and a new 1,000 gpm well near the Interchange with a 12" pipe connecting them would provide the necessary quantity.

Additional lines and fire hydrants must also be extended into areas of projected growth to adequately provide for the estimated increase in population.



Garden Acres Estates. There are 57 connections to the Garden Acres Estates Water System. This system consists of an 8 inch well, with a 90 gpm pump, and a distribution system of less than 6 inch diameter pipes. Therefore, fire protection does not meet National Board of Fire Underwriters' criteria.

Bloomingdale. The existing water system consists of one 350 gpm well and a 75,000 gallon elevated tank for a total system capacity of 600 gpm. The National Board of Fire Underwriters recommends a quantity of 1,080 gpm for the present population of 1,588 persons.

By 1985, it is estimated that the population will reach 2,400. According to the National Board of Fire Underwriters, this will require that 1,500 gpm of water be available. To provide for this growth, a new 300,000 gallon elevated tank and a new 1,000 gpm well to be shared with Pooler will be required. Extensions of the present lines into areas of projected growth with larger pipes will be required.

Thunderbolt

Thunderbolt is now served by a community system of two wells and a 100,000 gallon elevated storage tank having a total capacity of 1,335 gpm. The present population is estimated to be 2,750 persons and is expected to increase by 3,300 by 1985.

The present supply and storage are adequate for the existing population, however, additional large lines and fire hydrants need to be located in areas where fire demands are not presently satisfied.

To provide adequate service for the domestic and fire demands of the expected population of 3,300 persons, the National Board of Fire Underwriters specifies that a total of 1,600 gpm be made available. It is recommended that a new 400 gpm well be drilled, additional fire hydrants installed, and new and larger lines be installed to sufficiently balance the pressures and provide adequate coverage.

Pine Forest Subdivision

This is an isolated residential development on Highway 21. It has a population of 92 people now and is expected to grow to 300 people by 1985.

The existing system consists of a well, pressure tank and adequate distribution system. The well has a capacity of 600 gpm, but a 150 gpm pump was installed because of the small initial load. To make the system adequate for the 1985 population, it will be necessary to install a 600 gpm pump in the existing well.

Larchmont Estates

Larchmont Estates is a subdivision located on U. S. 17 south of Savannah. The present population is estimated to be 141 residents and, by 1985, is expected to reach 1,200.

The existing system consists of a 700 gpm well, pressure tank and adequate waterlines. The National Board of Fire Underwriters specifies that to meet the fire and domestic demands of an expected population of 1,200 people, a quantity of 1,100 gpm must be provided. This additional quantity could be best provided by erecting a 150,000 gallon elevated storage tank. The flow available would then be 1,200 gpm.

Hunter Army Airfield

Hunter Army Airfield is presently an active military post, but it is scheduled to be placed in "caretaker" status in 1973. It has an independent water system that conforms to good design criteria. The design and construction of water at the post

is a responsibility of the U. S. Corps of Engineers. The existing system is adequate for its present mission or possible urban development if the base is declared surplus. Inasmuch as the system is not connected to any community systems, and the future mission of this post cannot be determined, no additional comments are appropriate.

Chatham City

This is a 400 unit apartment project. The water distribution system was built by the developer and connected to the Garden City system. The distribution system has now been turned over to Garden City and is a part of their system.

East Pines

This subdivision consists of 47 lots on Oatland Island, north of the Islands Expressway.

Additional homes are now being built on the south side of the Islands Expressway. The privately owned water system has been extended to serve both the original 47 lots on the north side and the new development. The system consists of a 500 gpm well, 5,000 gallon pneumatic tank and a distribution system with fire hydrants. Because this area is isolated from other systems that could give it support, a 500 gpm additional well should be constructed.

Savannah Yacht and Country Club Estates System

This subdivision is located on Bradley Point Road and serves an estimated population of 40 people. An announcement has recently been made about the proposed development of approximately 105 acres just north of this subdivision. In addition, there are about 500 acres of very desirable undeveloped land on Whitemarsh Island just north of the Old Tybee Road. There should be a single properly sized water system that would serve the existing subdivision and be expanded to serve the two potential developments. The existing system consists of a 200 gpm well with 6" pipes and fire hydrants. An additional 1,000 gpm well and 300,000 gallon elevated storage tank as well as a distribution system that will provide fire protection are required to serve this entire service area.

Ogeechee Farms

Ogeechee Farms is a development located on U. S. 17 south of Savannah. There are presently 695 residents in the area and this figure is projected to reach 1,340 by the year 1985.

There is a small community water system of undersized pipe and a 160 gpm well which is adequate for the domestic requirements of the development. Larger pipes must be constructed to provide adequate pressures and supply over the area.

Isle of Hope-Wymerly-Harrock Hall and Lakeside

Isle of Hope is presently served by privately owned community water systems and by individual private wells. Approximately 560 customers are connected to the two privately owned systems and an estimated 105 are served by individual wells. The existing water systems generally are poorly looped and have many undersized pipe. Fire hydrants are sparsely located and pressure for domestic service is insufficient in many areas. The island is served from four wells having a combined supply of approximately 1,750 gallons per minute.

The area west of Herb Creek has one small privately owned water system serving Lakeside Park. The system has generally 2 inch lines with some 3 inch and 4 inch connectors, so it is not adequate for effective fire protection.

The new water system should be connected to the City of Savannah's system at Montgomery Cross Road and Skidaway Road for mutual support. The existing small community wells should be incorporated into the system but their capacity is insufficient so a new 1,000 gpm well should be constructed. A 500,000 gallon elevated storage tank should be erected in the vicinity of Parkersburg Road and Cornus Drive. This is near the center of the Isle of Hope area which has a weak distribution system and by connecting it to the area west of Herb River by means of an 8 inch pipe, would provide adequate pressure and protection to the area between Isle of Hope and Savannah.

Grove Hill Water System

This is a system serving 18 houses on the Grove Point Road 1 1/2 miles south of Highway 17. It provides only domestic service with a 6 inch well, 265 gpm pump, 5,000 gallon pneumatic tank and 2 inch pipes. This area has been acquired by the Developers of Georgetown.

Rio Vista (Burnside Island)

The Rio Vista water system consists of 2 wells with a total capacity of about 180 gpm, 2 pneumatic tanks (1,000 gallon and 2,500 gallon) and small lines. It furnishes only domestic service. This system should be combined with Vernon View and surrounding areas and a proper system built. Vernon View has a 200 gpm well and a water distribution system

serving only a portion of the area with small lines. The present population is estimated to be 540 persons and is expected to increase only to an estimated 810 persons. For 810 persons, the National Board of Fire Underwriters recommends that 1,000 gpm be available to meet the fire and domestic demands. Since the existing system provides 200 gpm, there is a deficit of 800 gpm which will be satisfied by erecting a new 150,000 gallon elevated tank and installing a new 300 gpm well and pump. A distribution system consisting of larger pipes and fire hydrants must also be constructed.

Gray's Subdivision

This is a water system composed of an 8 inch well, 300 gpm pump, 10,000 gallon pneumatic tank, and about 3,000 feet of 6 inch water pipe that furnishes domestic service and some fire protection. This system should be combined with one that would serve White-marsh Island, Savannah Yacht and County Club Estates and the newly announced development of 105 acres.

Southwinds

This is a privately owned water system consisting of a 100 gpm well, 3,000 gallon pneumatic tank, and a limited amount of 6 inch water pipe. This system should be included in the Talahi-Wilmington Island water system and adequate water provided for the entire area.

Talahi Island and Wilmington Island

The Talahi water system is a privately owned system with a 4 inch well, 60 gpm pump, a 1,000 gallon pneumatic tank, and 3,000 feet of 3 inch pipe. It serves 13 residences with domestic water. No sanitary sewerage is available. This island should be combined with Wilmington Island to make a proper water system.

Talahi Island is situated to the northwest of Wilmington Island. It is smaller than Wilmington Island and is reached from Wilmington Island via a causeway and a highway. The present population is estimated to be 407 persons and for the purposes of determining ultimate requirements, the population is expected to reach 1,840 persons.

Wilmington Island is in various stages of development. There are three existing subdivisions, Wilmington Park, Islandwood and Southwinds, on this island. Larger homesite tracts are located around the fringes and a large golf course occupies the central portion of the area. In addition to a school, there has been some commercial development along the highway. The Wilmington Park and Islandwoods water systems are owned and operated by the City of Savannah.

The present population of Wilmington Island is estimated to be 2,400 persons. To determine the adequate future requirements for all areas of the island, it is anticipated that the present population will ultimately increase to 23,000 persons.

The ultimate population of the two islands for purposes of determining the ultimate water needs totals 25,000 people. The 1985 population is projected to be 9,900.

The three subdivisions on Wilmington Island have existing systems with wells and lines. Other areas have individual shallow wells for water supply. Only the major sources are considered here and the existing wells and pumps produce a total of 1,600 gpm. The well on Talahi Island produces an additional 60 gpm.

Because of the proximity of Talahi Island to Wilmington, it is recommended that the future water services of the two islands be combined. As a basis for determining an adequate water system for the future growth, the expected population of 9,900 persons is used.

The National Board of Fire Underwriters recommends for fire and domestic demands a quantity of 4,100 gpm for the ultimate population of 9,900. The deficit of 2,440 gpm will be overcome by the erection of a new 400,000 gallon elevated tank near the center of the area. An additional 500 gpm well and pump on Talahi Island, a new 200 gpm pump for the existing Talahi Island well and a new 1,000 gpm pump to replace an existing 500 gpm pump for the 16 inch well in Wilmington Park Subdivision. New lines and fire hydrants must be placed in the growth areas and all existing systems connected to the new system to equalize flow requirements and provide mutual service in the event of a power failure or other interruptions of service.

Spanish Hammock

The existing water system consists of a 150 gpm well and small service lines. The present estimated population is 70 persons. By 1985, this figure is expected to increase to 260.

The minimum quantity for fire demand is 500 gpm as recommended by the National Board of Fire Underwriters. The deficit can be overcome by installing a new 350 gpm well and pump and adding larger pipes and fire hydrants.

Turners Rock

This is a private water system that furnishes domestic and limited fire protection to six houses on Turners Rock. The system consists of a 200 gpm well and pump, 10,000 gallon pneumatic tank, and 6 inch water lines with hydrants. This is a stable community with large tracts and is not likely to become densely developed. The large size of the tracts make septic tanks practical and water borne sewerage impractical. No changes are recommended in this system.

Lakeside Park

This water system is privately owned and serves 80 residences. It has two 4 inch wells, a 5,200 gallon pneumatic tank and a 2 inch water distribution system. It does not provide fire protection. This area should be combined with Harrock Hall and Isle of Hope. These areas are located near each other, therefore, to be economically feasible, we recommend that the requirements be combined for a new overall system.

Laurel Hill

This is a private water system near Whitfield Avenue, south of the Old Montgomery Road. It serves 2 customers and there are 15 undeveloped lots that it could serve. The system consists of a 3 inch well, 2 pneumatic tanks (2,000 gallon and 500 gallon) and small pipe. It furnishes only limited domestic service and no fire protection. It is recommended that this system be replaced by the large system proposed to serve the Montgomery area with water and sewerage.

Rivers Ends

This is a private water system consisting of two 4 inch wells with a combined capacity of 140 gpm. There are 2 pneumatic tanks (1,500 and 1,200 gallons) and a distribution system of 3 inch and smaller pipe serving 73 connections. This system does not provide fire protection. It is recommended that 6 inch lines and fire hydrants be installed and connected to the existing City of Savannah system at Rose Hill.

Grove Park

This is a cooperative system owned by the 46 residents of Grove Park. It is surrounded by City of Savannah water and sewer facilities and, therefore, enjoys a measure of fire protection at no direct cost. The system consists of a 4 inch well, 75 gpm pump, 5,000 gallon pneumatic tank and 2 inch water distribution

system. It, therefore, provides only domestic service.

The Bluff-Causton Bluff

There is a privately owned water system in the Bluff Sub-division which serves the southern portion of Causton Bluff on the Wilmington River. It now serves 24 lots and is intended to serve 50. The system consists of a 4 inch well pneumatic tank and 6 inch water lines which provides domestic services and some fire protection. It does not have the 500 gpm capacity required by the National Board of Fire Underwriters.

Plans have been prepared to develop the area north of the Islands Expressway, and the high ground west of the Bluff which will produce 800 residential sites. It is recommended that the City of Savannah's water system be extended to the Wilmington River and an additional 1,000 gpm well be constructed. If the residents of The Bluff desire fire protection, the private system could be acquired and connected to the extension.

Skidaway Island

The Ocean Science Center of the Atlantic (OSCA) which is controlled by the Regents of the University System of Georgia owns approximately 1,280 acres and has constructed technical facilities related to oceanography. They have established an industrial lot subdivision expected to attract ocean oriented industries. A 500 acre State Park is scheduled for development starting in 1973. The remainder of approximately 5,500 acres is owned by land owners who have planned to develop with residential construction, as have the owners of Green Island. The ultimate population of Skidaway and Green Islands including population equivalents of OSCA and the State Park, is 40,000 persons.

Development has started in the major land owners portion and the acceptance experienced in this first phase indicates that Skidaway Island will be totally developed by 1985.

The OSCA land has a 100,000 gallon elevated storage tank, a 500 gpm well and pump and a distribution system. Because of the difficulty sometimes experienced in negotiating with State agencies, it is possible that this system will remain isolated from the rest of the island development. It would be desirable to provide a single water system to serve the lands developed by the other owners. The 1985 requirements would be a 1,000,000 gallon elevated storage tank and four 1,000 gpm wells.

Gateway Savannah

This tourist oriented development at the Interchange between Abercorn Expressway and Interstate Highway 95 has two privately owned water systems serving the motel, restaurant and service station complex. One system consists of a 1,000 gpm well and 10,000 gallon pneumatic tank. The distribution system provides fire flows to each motel site.

Other Water Systems

The remaining 18 water systems that were inventoried serve small isolated establishments and trailer parks. None of them furnish fire protection or sanitary sewerage. Therefore, they should be absorbed in the countywide system shown on the plan where this system is nearby.

Sanitary Sewerage

Areas where a substantial increase in density is predicted for 1985 are considered to require water borne sanitary sewage collection and treatment even though none exists now, and no existing agency is presently set up to administer a system.

Existing treatment facilities should be used where possible because the collection systems now flow to them. Adding substantial loads to these facilities will require major modifications and change in the type of treatment. Areas that are isolated by marsh, water, or distance will require separate treatment facilities even though the facility will be smaller than desirable. All streams into which treated sewage is to be discharged are classified as recreational streams, (except the Savannah River, Pipe Maker and Springfield Canals). The ultimate plan is to discharge treated waste into the Savannah River or to spray it onto turfed areas, such as golf courses or sandy wooded areas where the soil bacteria can utilize it. The sparse development in outlying areas, the distance to the Savannah River, and the lack of available turfed areas owned or controlled by municipalities make it unlikely that this goal can be reached by 1985 in many cases. In new developments where golf courses are proposed, spray irrigation should be used as a method of disposal. As an interim measure, where disposal to the Savannah River is unreasonably expensive, and no turfed areas are available, it is proposed to provide tertiary treatment, post chlorination, and to discharge the effluent into nearby streams until the flows become great enough to warrant pumping to the Savannah River.

A program of monitoring the quality of the receiving streams should be established so that when degradation takes place the effluent from these plants can be pumped to more suitable receiving streams. It is expected that this condition will not

occur until these areas are densely developed well beyond 1985.

Collection lines will be sized to carry the ultimate peak flow. In some cases, the population projected for 1985 will not require the size and location of gravity sewers shown. Locations are determined by topography and the sizes of the sewer structures are determined by the area that will ultimately drain to them. Since the present and 1985 contributing populations will be less than the ultimate flows, the slope of the pipes are based upon providing self cleaning velocities at minimum flows.

The pipe sizes and lift station, and treatment plant capacities shown on the 1"-400' scale maps are based upon preliminary information and are, therefore, approximate. They are intended to show the order of magnitude of these structures so that if a segment of the entire system is developed, the designer will be aware of its relationship to the whole system.

The ultimate 1985 system will consist of 19 treatment facilities and service areas in addition to Hunter Army Airfield. Wherever possible, existing facilities should be incorporated into the proposed systems to utilize the existing portions of the collection systems. The proposed improvements are sized to serve the ultimate development so the work could be done in phases to match the development of the area. Construction necessary to upgrade the quality of treatment given by the existing facilities should be done as quickly as possible even though the expansion cannot, and should not, be done until necessary.

The proposed Sanitary Sewer Service Areas are:

1. Port Wentworth
2. Garden City
3. Travis Field - Woodlawn - Sharon Park - Central Junction
4. Pine Forest
5. Pooler and Bloomingdale
6. Georgetwon - Ogeechee Farms - Larchmont
7. Silk Hope - Pine Hill
8. Cloverdale
9. President Street - Bacon Park - Thunderbolt - Causton Bluff
10. Wilshire Estates
11. Windsor Forest
12. Montgomery
13. Isle of Hope - Harrock Hall - Lakeside - Wymberly
14. Oatland Island - Whitmarsh Island - Bradley Point
15. Talahi
16. Wilmington Island
17. Skidaway Island - Green Island
18. Savannah Beach
19. Gateway Savannah
20. Hunter Army Airfield



Industrial Waste

The principal industrial area is located along the Savannah River from Port Wentworth to the Wilmington River. The State Department of Natural Resources, Environmental Protection Division ordered industries to desist discharging industrial and sanitary waste into the river. All industries except American Cyanamid have complied by construction treatment facilities for their industrial waste. At others, the sanitary waste is discharged to the City of Savannah or Garden City treatment plant. The Continental Can Company has built a treatment facility that treats the City of Port Wentworth's, Savannah Food and Industries', as well as their own waste.

Operation

The operation of these systems will require a major effort by public officials. The cost of constructing adequate water and sewage facilities will be great, yet they will have limited value unless they are properly operated. The water systems that presently exist are fairly simple to operate because they consist of wells and isolated distribution systems. Only the City of Savannah has a water system that requires much more than routine maintenance to keep the systems operating. Adequate water through the developed area of the County would require an interconnected system with elevated storage tanks or other emergency measures. Pumps which would be sized for peak loads should not operate at periods of low draft. It will, therefore, require skilled operators to assure an adequate supply at all times with the minimum pumping cost. Tanks, valves and other water works equipment will need regular maintenance to insure lowest annual cost.

Operation of the sewage systems is most important. More complex equipment is being developed that will provide better treatment at a lower capital cost. Numerous lift stations will be required to serve the developing areas. It is assumed that improvements will be designed by competent engineers using the best equipment that technology makes available. However, no matter how well designed and built, a system will only be good if it is operated properly. Because they are out of sight, sewerage structures can malfunction for long periods without the public being aware of them. When they malfunction, the waste is not properly treated and the cost of constructing these facilities is not justified.

The State of Georgia requires that all Water and Wastewater plants be operated by Certified Operators who have been examined and found to possess the necessary skill and experience. The classes of operators and the size of the

system they are authorized to operate are set forth in Tables IV and V.

TABLE IV

WASTEWATER TREATMENT PLANT CLASSIFICATION

Description	Design Flow (mgd)			
	Class I	Class II	Class III	Class IV
Chemical and/or physical process providing a high degree of treatment including tertiary treatment other than polishing ponds	3.0 or greater	0.25 to 3.0	0.005 to 0.25	-
Activated sludge process or modification, other than extended aeration	5.0 or greater	0.50 to 5.0	0.005 to 0.50	-
Extended aeration process	7.5 or greater	2.0 to 7.5	0.05 to 2.0	0.005 to 0.05
Trickling filter process	10.0 or greater	2.0 to 10.0	0.05 to 2.0	0.005 to 0.05
Waste stabilization ponds, including plain aeration	-	5.0 to greater	1.0 to 5.0	0.25 to 1.0
Sewage collection systems and pumping stations	-	5.0 to greater	2.0 to 5.0	0.50 to 2.0

The above classifications shall be considered as minimum levels, and the Board may classify any plant at a higher level if the complexity or location of the plant or critical uses of the receiving waters warrant such higher classification in the judgement of the Board. Any plan not fitting any of the above standard descriptions shall be classified individually according to the judgement of the Board.

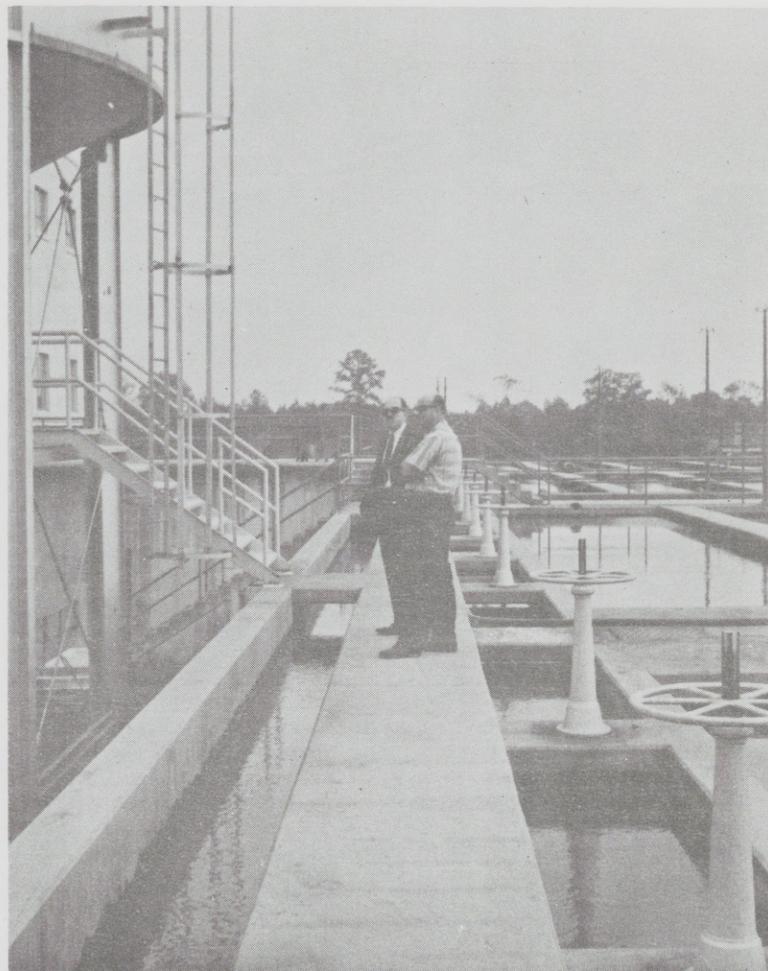
TABLE V

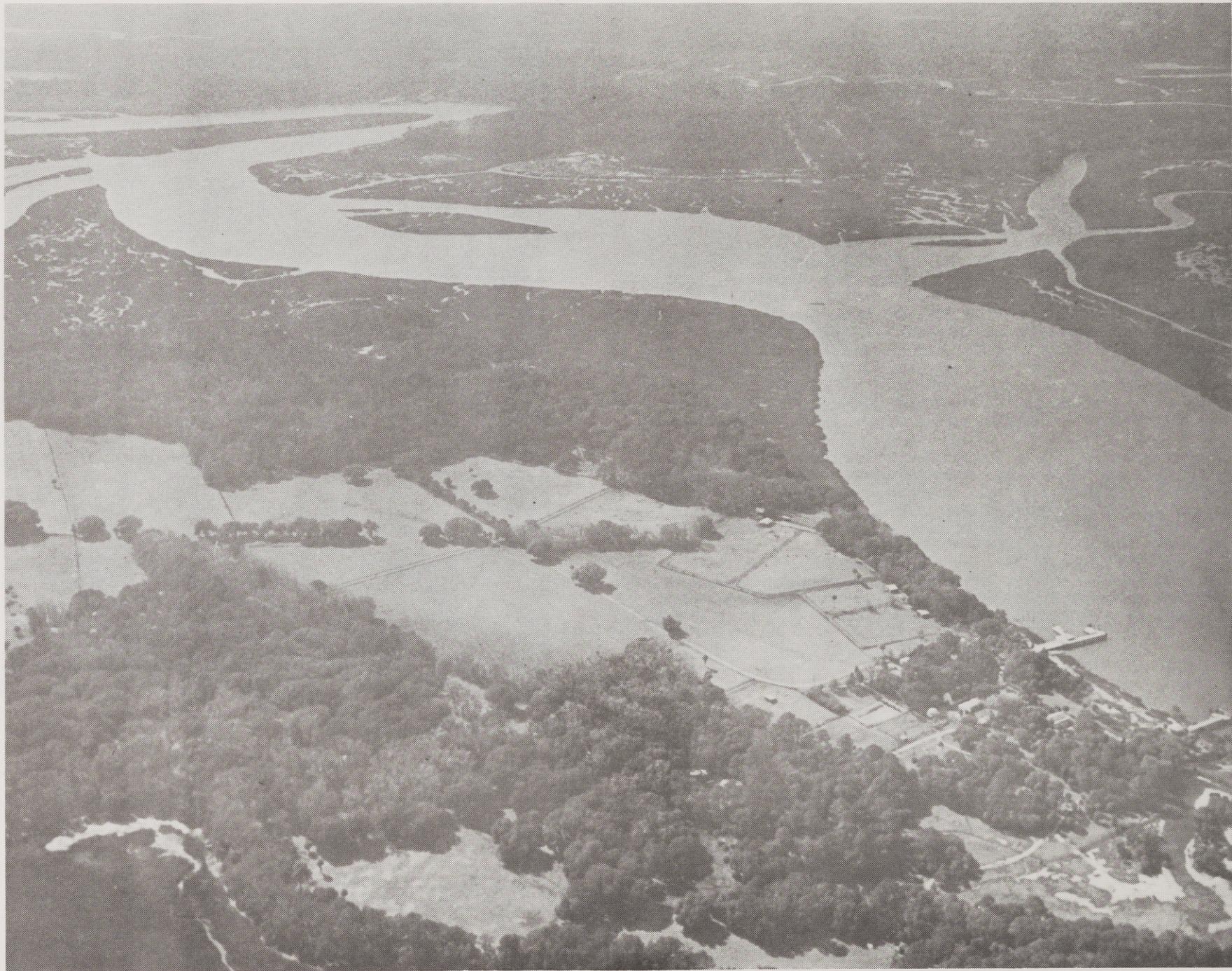
PUBLIC WATER SUPPLY SYSTEM CLASSIFICATION

<u>Description</u>	<u>Design Flow (mgd) or Population Served</u>			
	<u>Class I</u>	<u>Class II</u>	<u>Class III</u>	<u>Class IV</u>
Ground Water Systems	50,000 pop. or greater	10,000 to 50,000 pop.	1,000 to 10,000 pop.	100 to 1,000 pop.
Surface Water Systems	5.0 mgd or greater	0.010 to 5.0 mgd	---	---
Distribution Systems	---	50,000 pop. or greater	1,000 to 50,000 pop.	100 to 1,000 pop.

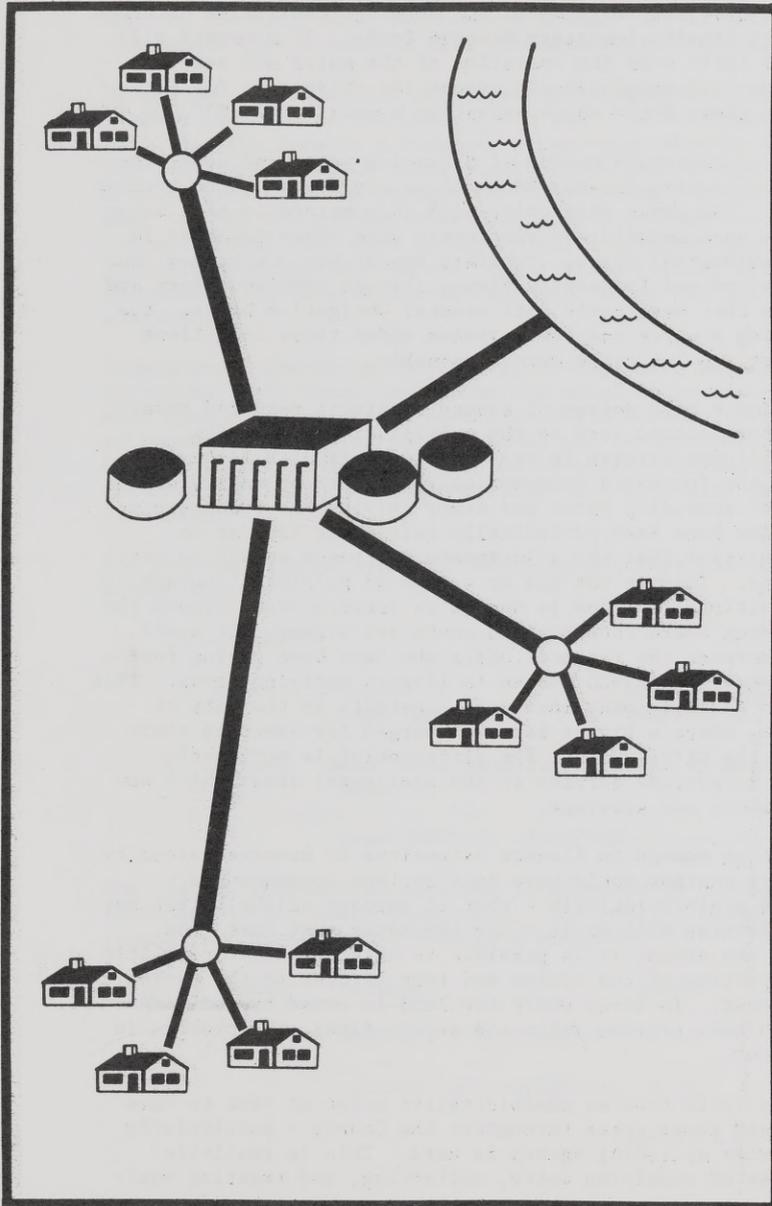
The above classification shall be considered as minimum levels, and the Board may classify any system or plant at a higher level if the complexity of the system or plant warrants such higher classification in the judgement of the Board. Any system or plant not fitting any of the above standard descriptions shall be classified individually according to the judgement of the Board. Where water is supplied to a distribution system from two or more sources, the classification may be set by the Board.

This observation leads to the recommendation that a single operating agency be set up to be responsible for all sanitary sewer systems in the County. This agency could then have the necessary laboratory personnel, equipment specialists, spare parts and other things necessary to keep all systems operating at maximum efficiency and maintain standards of quality that are possible with well designed and operated systems. This agency should be established as soon as possible so that training of operators could be started. The State Health Department conducts schools for water and sewer operators and the personnel responsible for the operation of the proposed systems should be graduates of these schools.





WATER AND SEWER FINANCIAL PLAN



The answer to stream pollution is effective sewage collection and treatment. In the early days of our country, sewage disposal was only an aesthetic amenity. Now it is a necessity not only for the conservation of wildlife but also for the health and welfare of man.

Effective sewage collection and treatment will require extensive financing. This report describes the ways and means of achieving the needed sewerage facility improvements.

The cost of constructing the water and sewer systems necessary to serve the expected population in Chatham County in 1985 is estimated to be approximately \$62,000.00.

The estimated cost of the work proposed in this plan is shown in Exhibit "A". A summary of these costs are:

Water:

Construction and Engineering	\$16,290,000.
Land Acquisition	<u>70,000.</u>
Total - Water	\$16,360,000.

Sewerage:

Construction and Engineering	
1. Collection System	\$32,688,500.
2. Land Acquisition	100,000.
3. Treatment Facilities	12,751,600.
4. Land Acquisition	<u>90,000.</u>
Total - Sewerage	\$45,630,100.
Grand Total	\$61,990,100.

The method of funding and paying for the proposed work is so vital to an overall plan that it must be recognized - even if it is only to show the factors that must be considered. Therefore, the following observations are made:

- A. It will be possible to construct the work contemplated by this plan solely with local funds. The Water Pollution Control Act of 1972 provides that sewage treatment plants and collector sewers in developed areas are eligible for E.P.A. Grants of 75%. This program has not been adequately funded to date so work even if eligible may not get the grants when needed. The HUD program which assisted with the construction of water and sewer projects has not been funded for fiscal 1974, so assistance from that source is unlikely. There is a possibility that State assistance for sewerage works may be given in the future, but since this proposal has been turned down by the General Assembly for the past three years, it would be imprudent to depend upon it.
- B. Some of the work needed is on private systems so it won't be a responsibility of the county wide agency unless these systems are taken over and the revenue from them goes to the agency.

- C. In developing areas, the landowners should be responsible for paying for the construction of parts of the systems.
- D. Most communities with water and sewerage facilities obtained them by issuing long-term Revenue Bonds. If a county wide agency takes over the operation of the water and sewer systems this agency should assume the obligation for amortizing these Bonds which amount to approximately \$35,000,000.

The desirable and customary method of financing water and sewer improvements is by issuing Revenue Bonds to be amortized by the revenue of the systems. The great difficulty with this method is that water and sewer rates were established when users were close together in grid pattern residential areas. Sanitary sewage was discharged into the river untreated and frequently flowed through combined storm and sanitary sewers that were built with General Obligation Bonds. The cost of operating a water and sewer system under those conditions was quite modest, so low rates were reasonable.

The necessity for a high degree of sewage treatment required today is added to other factors such as the multiplicity of pumping stations, curvilinear streets in residential areas with large lot frontages, and the increased consumption per capita of water, so that the cost of providing water and sewer service has risen spectacularly. Rates have been periodically raised but they are so politically sensitive that the adjustments are never enough to match the actual costs. This is not due to a lack of political courage because the additional revenue is needed to service areas around the core of the system where construction costs are higher. It would be unfair to increase the rates of users who have been paying for many years to serve those who choose to live in outlying areas. This dilemma has been faced in many instances - notably in the City of Savannah system, where a higher rate is charged for users on their system outside the City limits. The differential is not nearly enough however to provide service to the semi-rural areas which now need adequate water and sewerage.

Raising rates high enough to finance extensions to unserved areas by direct commodity charges would have such serious consequences - politically and administratively - that it appears unlikely that any political subdivision will do it. Yet the money must come from somewhere. In new areas, it is possible to make the developer build a substantial portion of the system and turn it over to the system owner without cost. In areas where the land is owned by individual home owners who have private wells and septic tanks, the problem is much more difficult.

It would be desirable from an administrative point of view to have uniform water and sewer rates throughout the County - particularly if the County wide operating agency is used. This is realistic because the cost of supplying water, collecting, and treating waste

is reasonably uniform regardless of the location. The wide variation is in the cost of constructing the systems to serve each area. This could be recognized by adding a tapping or connection fee that would make up the difference between the actual cost of construction and the amount that a uniform rate schedule would finance.

In new developments, the developer would pay these fees and presumably add them to the cost of the lot. In developed areas users could pay the fees in a lump sum or amortize them by an addition to his monthly bill which would enable sufficient revenue bonds to be issued backed by this obligation. The theory behind this arrangement is that the purchaser of a site in a new development is paying the additional cost when he buys his lot complete with water and sewerage, whereas the man who bought a lot without these facilities presumably had this cost deferred until water and sewerage was available.

In many areas the actual cost of providing water and sewer service is two to three times as much as the usual water and sewer rates will finance. Therefore, each area would have a different tapping or connection fee, but uniform water and sewer rates. While the City of Savannah rates are too low to produce anywhere near the revenue required, they could be used as a base with the tapping fee added.

The present City of Savannah Rates for services outside the city limits are:

Bi-monthly

Water:	0-2000 cf.	\$8 min. plus \$.22/100 cf.
	over 2000 cf.	.42/100 cf.
Sewer:	\$4.80 min. plus \$.13/100 cf. of water up to 2000 cf.	
	Over 2000 cf., \$.25/100 cf.	

The average residential customer is expected to use 1300 cf. (9750 gals.) per month year-round. The average water and sewer income per connection at this rate would be:

Water:	Minimum	\$8.00
	2000 cf. @ \$.22/100 cf.	4.40
	600 cf. @ \$.42/100 cf.	<u>2.52</u>
		\$14.92 x 6 = \$89.52/year

Sewer:	Minimum	\$4.80
	2000 cf. @ \$.13/100 cf.	2.60
	600 cf. @ \$.25/100 cf.	<u>1.50</u>
		\$8.90 x 6 = \$53.40/year
Total - Water & Sewer		\$142.90/year

The annual operating cost for an average customer is approximately \$60.00 per year for water, sewage collection and treatment. Therefore, approximately \$83.00 per year is available for amortizing water and sewer revenue bonds. This amount will amortize approximately \$900.00 depending upon the interest rate, term of bonds, and amount of coverage.

The City of Savannah's rate for users inside the City limits are deliberately lower than those outside. In older areas where narrow lots and a grid layout made the construction cost relatively modest per connection there is justification for this practice. However, the most important reason for favoring those inside the City is that they pay Ad Valorem taxes that can be used to supplement the water and sewer revenue when necessary.

It is likely that a difference in rates between those inside the City of Savannah and the rest of the County will be retained, even with a county wide agency operating the systems. It is, therefore, suggested that the rates listed above be adopted for all systems outside the Savannah City limits. The difference between the actual cost and the approximately \$900.00 that these rates can support would be made up by one of the following methods to meet the condition:

1. In developing areas:

The developer would pay the cost of all water and sewer construction above approximately \$900.00 per connection and would guarantee the number of connections at \$143.00 per year until the actual connections were made. This guarantee would be in the form of an escrow account or other suitable legal instrument.

2. In developed areas:

In developed areas the cost of the water and sewer was not included in the sales price of the lot so the lot owner would have to pay it directly. Therefore, the difference between the \$900.00 and the

actual cost should be paid as a connection or tapping fee paid for either as a lump sum or over the period of the Bond issue. Since the actual cost would vary in each District, the amount of tapping fee would also vary.

Chatham County has contracted with various municipalities that furnish sewerage treatment and pay \$6.00 per person per year for the capacity of the plant. Since the County cannot contract with itself the countywide agency would have to be an autonomous, legal organization to continue to enjoy this arrangement. The County obtains this money from Ad Valorem taxes so that all property in the County pays it and therefore, all should benefit from its use.

Some of the municipalities would prefer to continue to own their own water system even if the County wide agency owned and operated the sewerage systems. By custom, water rates are higher than necessary for water service alone, and the surplus is used to subsidize sewer service, for which charges are too low. If the County wide agency is to provide sewerage without water, the sewer service charges in those municipalities should be raised to reflect the actual cost.

If a municipality or private owner wishes to retain or build their own water and sewer systems, they should be permitted to do so provided they have systems complying with County and State requirements and operate the facilities in accordance with County and State standards. They should also be required to extend their systems to serve adjacent areas when these extensions are financially feasible.

The estimated cost of sanitary sewerage is based upon an arbitrary percentage of the cost of sewerage for the ultimate development of each area. It is obviously impossible to ascertain exactly just what portion of each service area will be developed by 1985, and it would be imprudent to build the entire system until better information on immediate development is known. It is believed that the percentage selected are reasonable for the expected 1985 population. The

sewerage treatment facilities would be of the type that can be expanded to match the actual growth.

Piping and lift station wet wells with capacity of the ultimate development should be built initially, and areas and arrangement for treatment facilities should be based upon the ultimate even though the equipment is sized for the 1985 population.

The estimates are based upon constructing only the principal features of the system such as main lines, wells, tanks, lift stations, force mains, interceptors, and treatment facilities. The water distribution lines and sewerage collection lines necessary to serve developed areas cannot be estimated now because the pattern of development is not established. The systems shown and the estimates are for a skeleton system that must be "fleshed out" by the extension of small lines to serve specific locations.

It will be necessary to acquire land for 33 wells and elevated tank sites in the water system, and for 105 lift stations and 6 treatment facilities in the sewer system. The cost of acquiring these sites will vary widely with the final location. Many of the sites may be obtained without charge by developers who need the facilities, but some of them must be acquired by purchase or condemnation. It has been found that putting a value on each site in a preliminary report sometimes leads land owners who would otherwise donate land to ask for payment.

Therefore, estimated land costs are as general as possible merely to advise that there will be costs and that they should be considered in the funding of the work.

The estimated cost of construction is based upon 1973 cost. Construction costs have been rising in recent years and they are likely to continue. The rate of escalation cannot be predicted so these estimated costs should be adjusted as the work is undertaken to reflect the cost index current at the time.

TABLE VI
 ESTIMATED COSTS OF WATER SYSTEM
 IMPROVEMENTS NEEDED IN CHATHAM COUNTY
 THROUGH 1985

1.	City of Savannah System	\$3,200,000.	13.	Ogeechee Farms	\$ 322,000.
2.	Savannah Beach	168,000.	14.	Burnside Island, Rio Vista, Vernon View	236,000.
3.	Wilmington Island -- Talahi Island	995,000.	15.	Spanish Hammock	140,000.
4.	Skidaway Island	3,744,000.	16.	Whitemarsh-Bradley Point	662,000.
5.	Isle of Hope	1,138,000.	17.	Isle of Armstrong	27,000.
6.	Woodlawn, etc.	535,000.	18.	Pooler-Bloomingtondale	898,000.
7.	Silk Hope	452,000.	19.	Garden City-Port Wentworth	317,000.
8.	Montgomery, etc.	752,000.	20.	Pine Forest	18,000.
9.	Georgetown	1,828,000.	21.	Larchmont	<u>85,000.</u>
10.	Gateway Savannah	420,000.		Total	\$16,290,000.
11.	Thunderbolt	269,000.		Land Acquisition	<u>\$ 70,000.</u>
12.	Oatland Island	84,000.		Grand Total	\$16,360,000.

TABLE VII

ESTIMATE OF COST OF SANITARY
SEWERAGE TO SERVE 1985 DEVELOPMENT

Area	Population Present	1985	Treatment	Collection	Total
1. Port Wentworth	3,905	4,205	\$ -	\$ 385,000.	\$ 385,000.
2. Garden City	5,741	6,700	\$ -	\$ 349,000	\$ 349,000.
3. Travis Field, Woodlawn, Sharon Park, Central Junction	4,000	6,000	\$ -	\$ 944,000.	\$ 944,000.
4. Pine Forest	92	300	\$ -	\$ -	\$ -
5. Pooler-Bloomingtondale	3,105	5,200	\$ 347,000.	\$ 1,284,100.	\$ 1,631,100.
6. Georgetown-Ogeechee Farms Larchmont	1,050	15,500	\$ 2,000,000.	\$ 4,004,000.	\$ 6,004,000.
7. Silk Hope-Pine Hill	1,670	8,000	\$ 1,212,000.	\$ 1,936,000.	\$ 3,148,000.
8. Cloverdale	2,800	14,000	\$ 700,000.	\$ 3,402,000.	\$ 4,102,000.
9. President St.-Bacon Park Thunderbolt-Causton Bluff	145,500	160,000	\$ -	\$ 6,230,000.	\$ 6,230,000.
10. Wilshire Estates	8,100	20,000	\$ 430,600.	\$ 560,000.	\$ 990,600.
11. Windsor Forest	8,400	30,000	\$ -	\$ 904,000.	\$ 904,000.
12. Montgomery	1,200	4,400	\$ 594,000.	\$ 944,000.	\$ 1,538,400.
13. Isle of Hope-Harrock Hall	4,300	6,800	\$ -	\$ 2,378,000.	\$ 2,378,000.
14. Oatland-Whitemarsh-Bradley Pt.	500	5,000	\$ 960,000.	\$ 1,595,000.	\$ 2,555,000.
15. Talahi	500	2,000	\$ 498,000.	\$ 514,000.	\$ 1,012,000.
16. Wilmington Island	2,400	12,000	\$ 1,560,000.	\$ 1,330,000.	\$ 2,899,000.
17. Skidaway-Green Islands	100	40,000	\$ 4,000,000.	\$ 5,000,000.	\$ 9,000,000.
18. Savannah Beach	1,800	2,500	\$ -	\$ 770,000.	\$ 770,000.
19. Gateway Savannah	100 P.E.	6,000 P.E.	\$ 450,000.	\$ 150,000.	\$ 600,000.
20. Hunter Army Airfield	-----	-----	-----	-----	-----
	Sub-Total		\$12,751,600.	\$32,688,500.	\$45,440,100.
	Land Acquisition		\$ 90,000.	\$ 100,000.	\$ 190,000.
	TOTAL		\$12,841,600.	\$32,788,500.	\$45,630,100.

TABLE VIII

MUNICIPAL OR COMMUNITY WATER AND
SEWERAGE SYSTEMS

Name of System	Water	Sewerage	Name of System	Water	Sewerage
1. City of Savannah Water & Sewerage System	X	X	22. Southwinds Water System	X	
2. City of Savannah Industrial and Domestic Water Supply	X		23. Bloomingdale Water Works	X	
3. Garden City Water & Sewerage	X	X	24. Spanish Hammock Water System	X	
4. Port Wentworth Water & Sewerage System	X	X	25. Turners Rock Water System	X	
5. Savannah Beach Water & Sewerage System	X	X	26. Lakeside Park Water Company	X	
6. Town of Pooler Water & Sewerage System	X	X	27. Laurel Hill Water Supply	X	
7. Town of Thunderbolt Water Works	X		28. Rivers End Water System	X	
8. Garden Acres Estates Water & Sewerage System	X	X	29. Grove Park Water Company	X	
9. Pine Forest Utility Corporation	X	X	30. The Bluff	X	
10. Larchmont Estates	X	X	31. Talahi Island Water System	X	
11. Hunter Army Airfield	X	X	32. Skidaway Island	X	X
12. Chatham City	(distribution only)	X	33. Heathcote Farms	X	
13. East Pines Water System	X	(collection lines in place)	34. Wassaw Island	X	
14. Woodlawn Water System Incorporation	X		35. Ossabaw Island	X	
15. Savannah Yacht & Country Club Water System	X		36. Gateway Savannah	X	X
16. Ogeechee Farm Water System	X		37. Georgetown	X	X
17. Parkersburg Water System	X		38. Azalea Plaza, U. S. 17 south across from Georgia Mobile Homes Trailer Sales	X	
18. Grove Hill Water System	X		39. Biltmore Gardens, U. S. 17 south across from Race Track	X	
19. Rio Vista Water System	X		40. Boaen Trailer Court, Ferguson Ave. (1 mile south of Newton's Corner)	X	
20. Gray's Subdivision Water System	X		41. Davis Mobile Homes, Dean Forest Rd.	X	
21. Wymberly Water System	X		42. Dean Forest Trailer Court Dean Forest Road	X	

Name of System	Water	Sewerage
43. Dyches Trailer Park Middleground Road	X	
44. Lucas Trailer Court Cartwright Avenue off Whitfield Avenue	X	
45. Lakeside (McCallar) Trailer Park U. S. 17 south behind Mac's Standard Oil Station	X	
46. Melody Acres Mobile Homes U. S. 17 south, behind Mammy's Kitchen	X	
47. Norton's Trailer Park Route 5, Box 143, Buckhalter Road 300 yrds south of U. S. 17	X	
48. Plantation Inn U. S. 17 south at Plantation Inn	X	
49. Shady Acres Mobile Home Court Quacco Road about 1/8 mile north of U. S. 17 south and across from Larchmont Estates	X	
50. Southside Trailer Park Middleground Road	X	
51. Tucker's Trailer Park U. S. 17 south at Stiles Avenue (N.W. Corner)	X	
52. Vick's Trailer Park Middleground Road	X	

RECOMMENDED SEWAGE
SERVICE AREAS

On the following pages, possible sewage areas are presented together with the needed improvements as indicated by the Water and Sewer Plan. Also included are generalized sewer service areas maps for each recommended system and anticipated costs as estimated by consulting engineers.

The map on page 37 provides an overall view of the recommended sewer service areas.



SEWER SERVICE AREAS

1. PORT WENTWORTH
2. GARDEN CITY
3. TRAVIS FIELD, WOODLAWN
SHARON PARK, CENTRAL JUNCTION
4. PINE FOREST
5. POOLER - BLOOMINGDALE
6. GEORGETOWN - OGEECHEE FARMS -
LARCHMONT
7. SILK HOPE - PINE HILL
8. CLOVERDALE
9. PRESIDENT STREET - BACON PARK -
THUNDERBOLT - CAUSTON
10. WILSHIRE ESTATES
11. WINDSOR FOREST
12. MONTGOMERY
13. ISLE OF HOPE - HARROCK HALL
14. OATLAND - WHITMARSH - BRADLEY PT.
15. TALAH
16. WILMINGTON ISLAND
17. SKIDAWAY - GREEN ISLANDS
18. SAVANNAH BEACH
19. GATEWAY SAVANNAH
20. HUNTER ARMY AIRFIELD

1. Port Wentworth

Present population - 3,905
1979 population - 4,155
1985 population - 4,205

The City of Port Wentworth has arranged with Continental Can Company to discharge the City waste into the company treatment facilities which provides secondary treatment and discharges into the Savannah River. The City now has under construction the pumping system for doing this. Extensions to the collection system will be required for the development expected by 1985.

Sewerage Facilities needed by 1985

Collection System \$385,000.

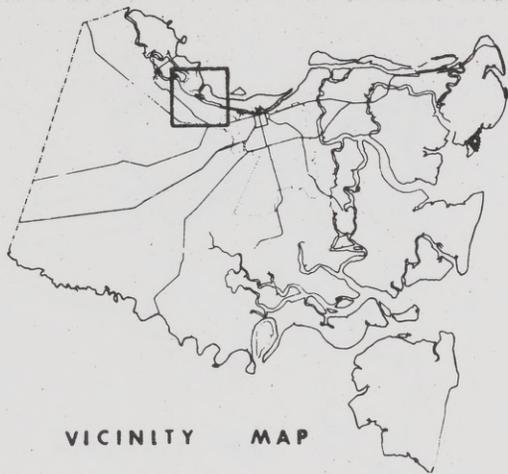
Annual Cost of Operations:

	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$20,000.	\$28,400.
Collection System	\$20,000.	\$28,400.

4. Pine Forest

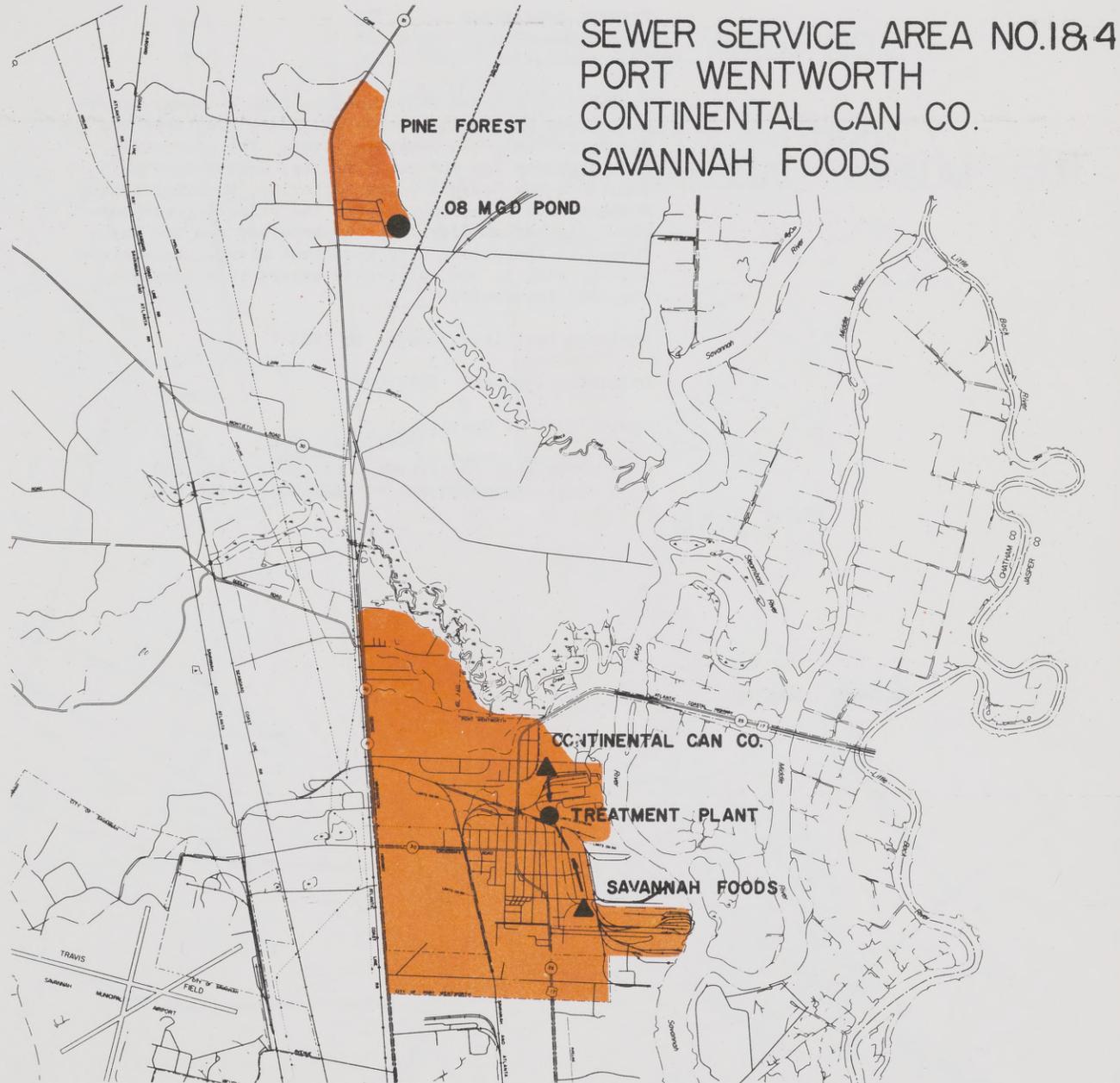
Present population - 92
1979 population - 150
1985 population - 300

The sewage in Pine Forest is now collected and pumped to a private three acre waste stabilization pond. This pond is adequate for the present and expected development.



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



2. Garden City

Present population - 5,741
1979 population - 6,545
1985 population - 6,700

Garden City now has under construction a sewage treatment plant that will provide secondary treatment and discharges into the Savannah River. The plant will have capacity for the municipality, Garden City Terminals of the Georgia Ports Authority, National Gypsum Company, and GAF Corporation. The primary treatment plant at Chatham City will be abandoned and the waste pumped to the Garden City treatment plant. Extensions must be made to the collection system to accommodate the 1985 population.

Sewerage Facilities needed in 1985

Collection System \$349,000.

Annual Cost of Operating:

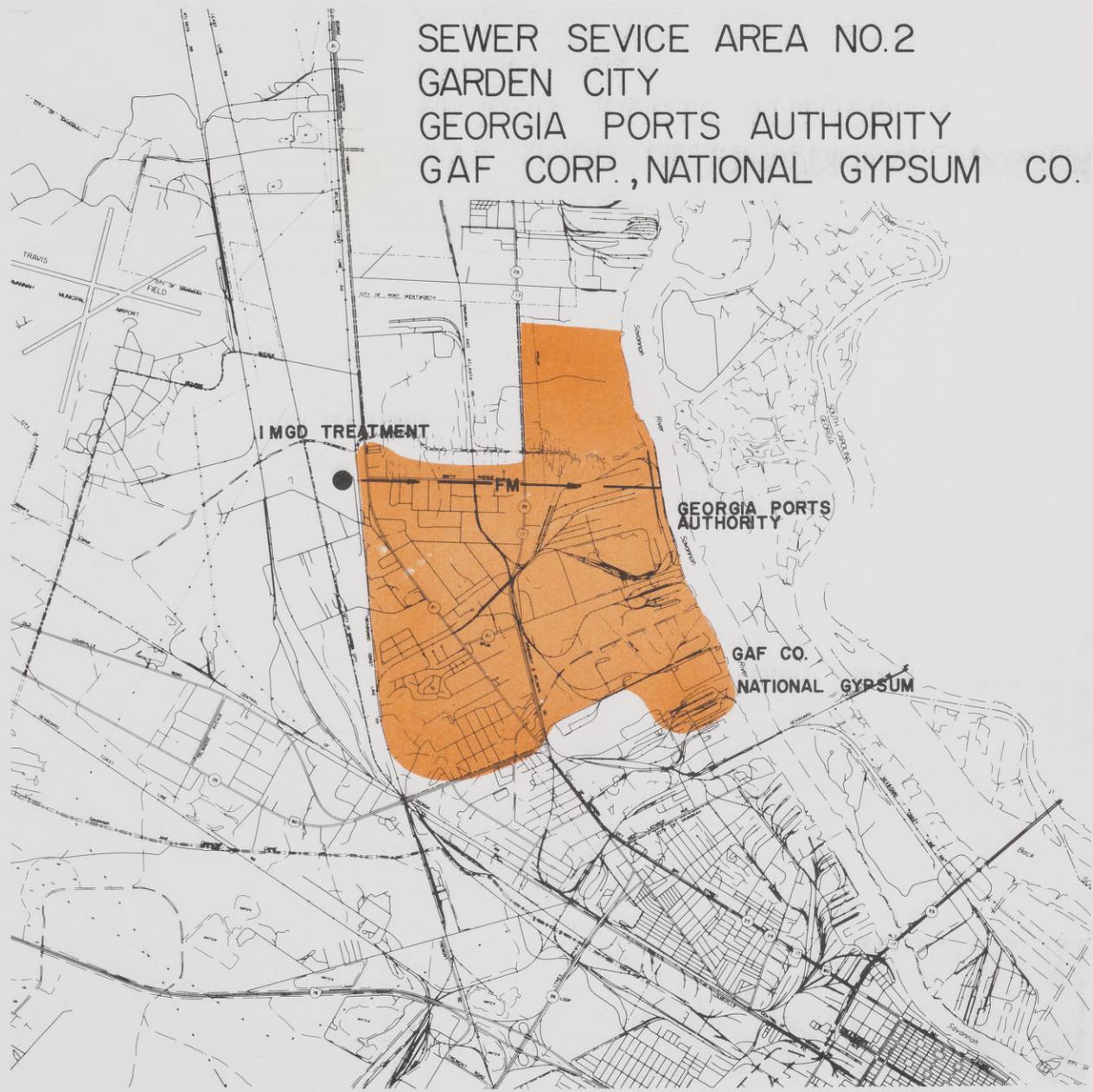
	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$35,000.	\$40,000.
Collection System	\$35,000.	\$40,000.

SEWER SERVICE AREA NO.2
 GARDEN CITY
 GEORGIA PORTS AUTHORITY
 GAF CORP., NATIONAL GYPSUM CO.



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



3. Travis Field-Woodlawn-Sharon Park-Central Junction

Present population - 4,000 P.E.
1979 population - 4,500 P.E.
1985 population - 6,000 P.E.

A new 1 MGD secondary treatment plant was completed by the City of Savannah at Travis Field in 1972. This plant discharges into the Pipemaker Canal and thence to the Savannah River. The communities of Woodlawn, Sharon Park and Central Junction should construct a sewage collection system and pump their waste to Travis Field. There are privately owned small treatment plants at Nassau Woods and Suburbanite Village that should be abandoned and the waste from these two Mobile Home Parks pumped to Travis Field.

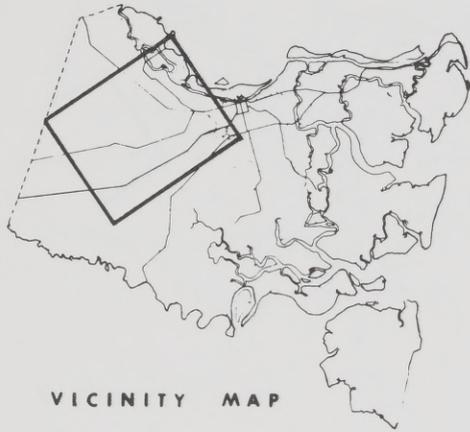
Construction Needed by 1985

Sewer Mains & Pumping Stations	\$636,000.
Laterals	\$308,000.

Annual Cost of Operations:

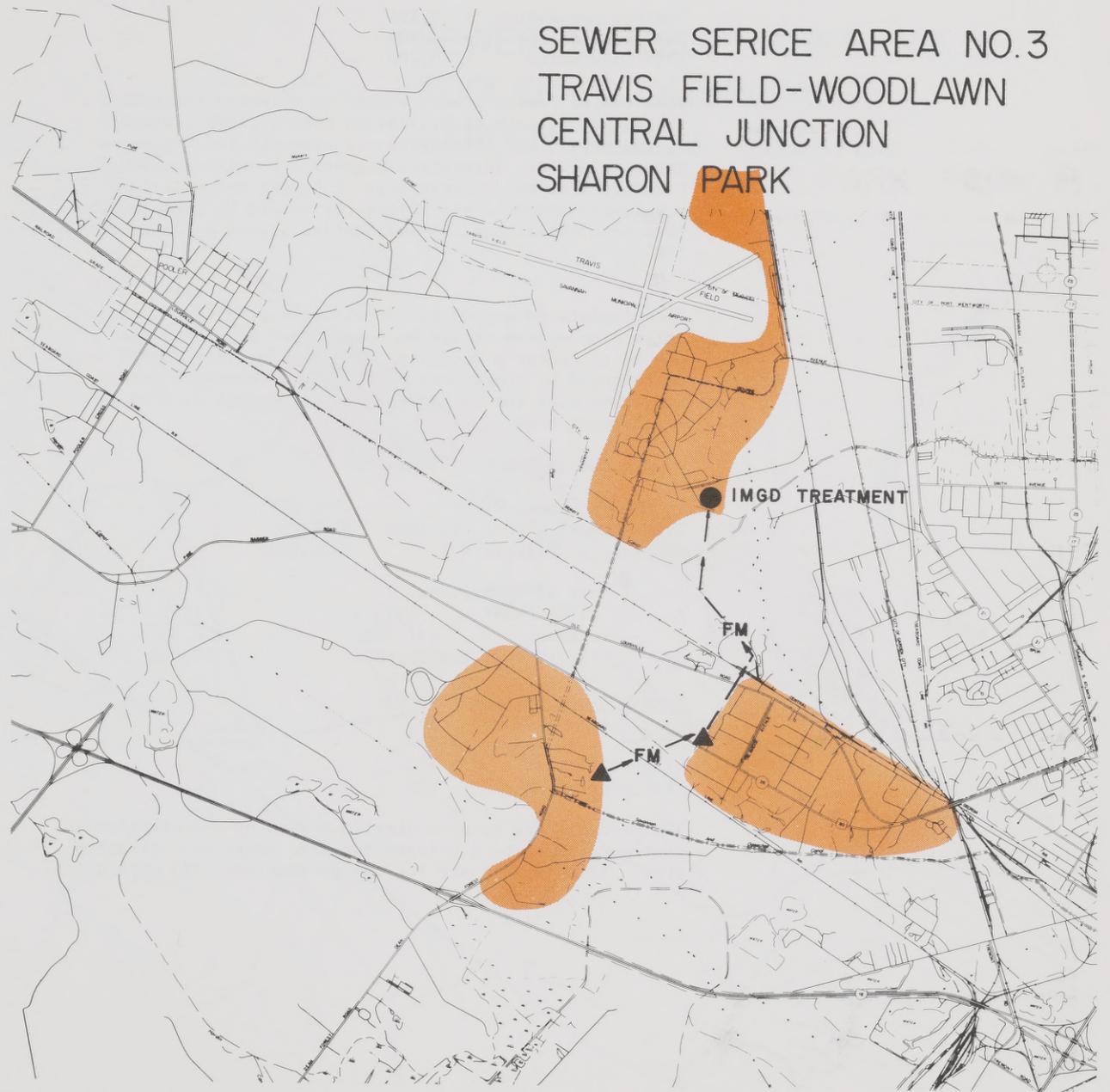
	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$28,000.	\$37,500.
Collection System	\$22,500.	\$30,000.

SEWER SERVICE AREA NO.3
 TRAVIS FIELD-WOODLAWN
 CENTRAL JUNCTION
 SHARON PARK



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



5. Pooler-Bloomington

Present population - 3,105
1979 population - 4,400
1985 population - 5,200

The Town of Pooler is now served by a sewage collection system and a waste stabilization pond located southwest of the area. The facilities are adequate for the existing population. Interstate Highway I-95 will cross U.S. Highway 80 at the eastern edge of Pooler and will form a valuable interchange. Provision should be made to serve this area as well as the residential growth expected for 1985

Bloomington is served by individual septic tanks. A collection system should be constructed and the waste pumped to Pooler's facility. Pooler's facility should be enlarged by constructing a .5 MGD treatment plant and converting the existing waste stabilization pond to a polishing pond.

Sewage Facilities Needed by 1985

.5 MGD Treatment Plant	\$446,000.
Trunk Sewers & Pump Stations	\$782,000.
Laterals & Collectors	\$636,000.

Annual Cost of Operations:

	<u>1979</u>	<u>1985</u>
Treatment	\$31,200.	\$50,000.
Collection System	\$25,000.	\$40,000.

Garden Acres Estates (Map 6)

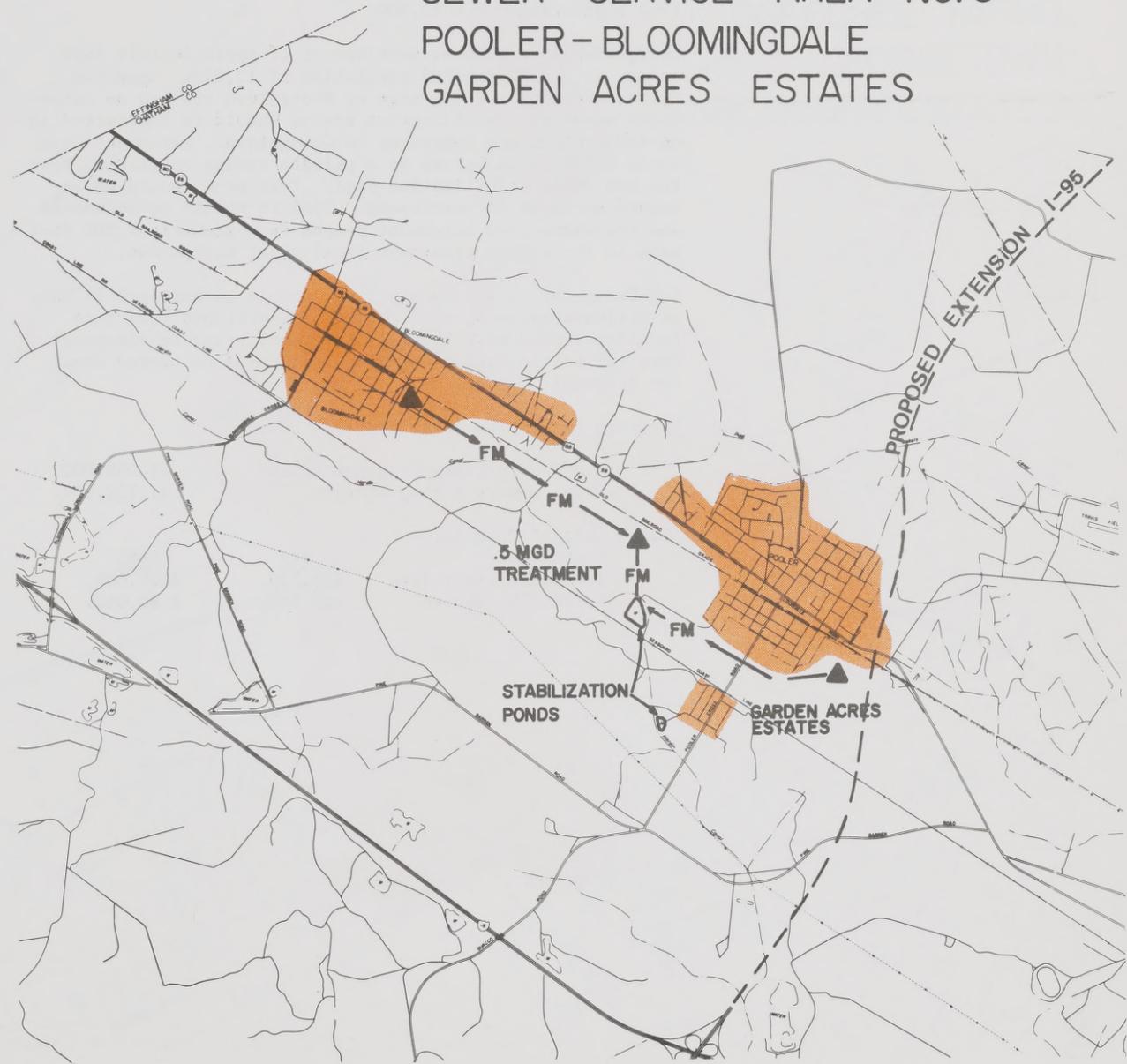
Present population - 100
1979 population - 270
1985 population - 400

The Garden Acres Estates area is served by a collection system draining to a private two acre waste stabilization pond. This is adequate for the present and 1985 population.

SEWER SERVICE AREA NO. 5
 POOLER - BLOOMINGDALE
 GARDEN ACRES ESTATES



- LEGEND**
-  SEWER SERVICE AREA
 -  FORCE MAIN
 -  TREATMENT FACILITY
 -  PUMPING STATION
 -  STABILIZATION POND



7. Silk Hope - Pine Hill

Present population - 1,670
1979 population - 3,533
1985 population - 8,000

There are no sanitary sewers in this service area. The collection and treatment facilities proposed should serve all the developable land from Pulaski Park to the Dean Forest Road and between Interstate Highway 16 to Hunter Field. This will require lift stations, force mains and gravity sewers draining to a treatment facility. The treatment effluent should be pumped to the Springfield Canal thence to the Savannah River.

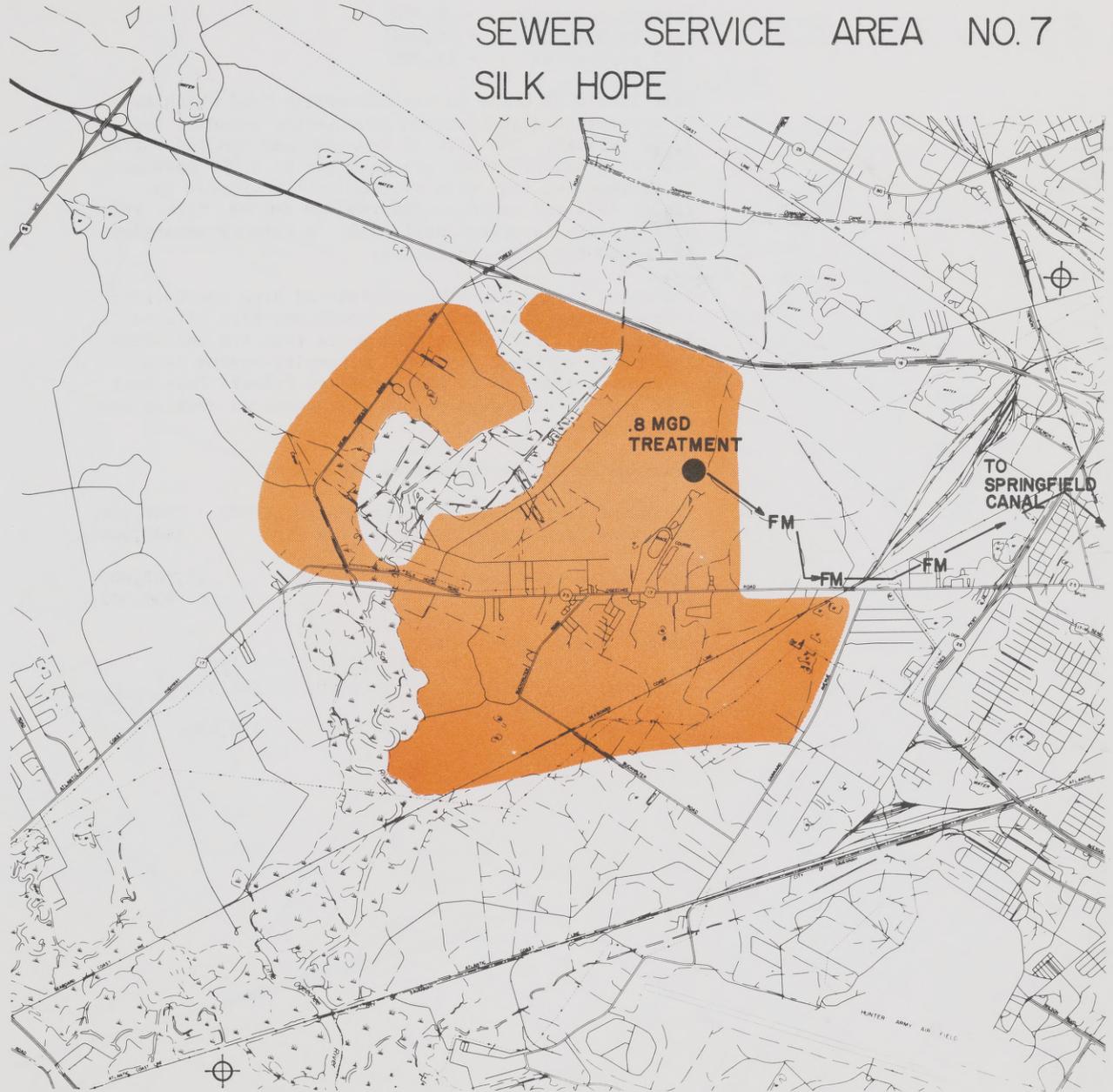
Sewerage Facilities Needed by 1985

New Treatment Facilities \$1,212,000.
New Trunk Sewers and Pump Station \$1,936,000.

Annual Cost of Operation

	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$ 0	\$50,000.
Trunk Sewers and Pump Station	\$ 0	\$40,000.

SEWER SERVICE AREA NO.7 SILK HOPE



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND

8. Cloverdale

Present population - 2,800
1979 population - 8,000
1985 population - 14,000

This area will drain to the Cloverdale Pond which is a 16 acre waste stabilization pond having capacity for 3,200 persons. The City of Savannah has applied for a federal grant to expand its capacity to 8,000 persons. It is expected that this project will be funded in fiscal 1974 and construction complete during 1974. This will provide capacity until 1979. A further expansion is needed for 1985 population.

A pumping system has been constructed from the Garrard Avenue-Louis Mills Road area, south and east of Lynes Parkway that will collect the waste from the unsewered areas east of Lynes Parkway. A pumping system is proposed west along U. S. Highway 17 to Pulaski Park that will provide discharge points for unsewered development in that area.

Sewerage Facilities Needed by 1985

Treatment Facilities, First Expansion .8 MGD \$300,000.
Treatment Facilities, Expand to 1.4 MGD \$400,000.

New Trunk Sewers and Lift Station \$3,002,000.
Laterals \$ 400,000.

Annual Cost of Operation

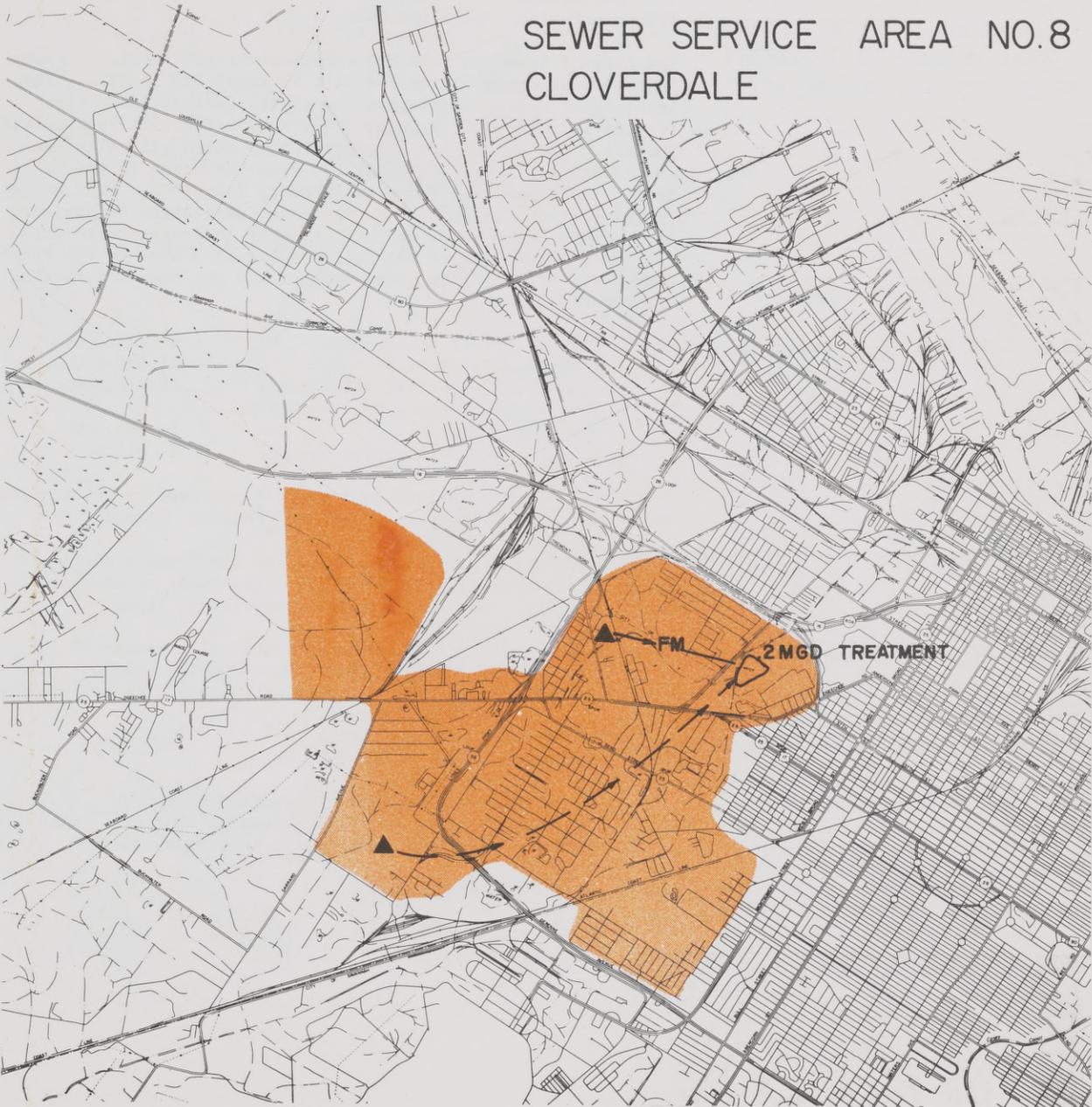
	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$50,000.	\$87,500.
Trunk Sewers and Lift Station	\$40,000.	\$70,000.

SEWER SERVICE AREA NO.8 CLOVERDALE



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



9. President Street-Bacon Park-Thunderbolt-Causton Bluff

Present population - 145,500
 1979 population - 156,000
 1985 population - 160,000

The City of Savannah's 20 MGD President Street Treatment Plant is now under construction and will be completed in 1974. The interceptor sewers leading to the plant, designated as the "Kayton Interceptor" is under construction and will be completed in 1974. The Bacon Park Pumping system, which will eliminate the Bacon Park Treatment Plant and pump the waste to the President Street plant, will be completed by July 1973. Four additional projects which will complete the separation of sanitary sewage from storm water and will provide interceptors to drain all the sanitary sewage within the collection area to the President Street Plant, have been designed and are awaiting funding. These projects are:

Paulsen Street Interceptor	\$ 792,000.
York Lane Interceptor	\$1,150,000.
West Side Industrial Interceptor	\$1,616,000.
Hopkins St.-Victory Dr. Separation System	\$ 544,000.
River Street Interceptor System	\$ 315,000.

The Town of Thunderbolt is having plans prepared to collect the waste in the Town and pump it to the President Street Plant.

Preliminary plans have been prepared to construct a collection system in Causton Bluff for the 800 residential units planned and to pump this waste to the President Street Plant.

It will be necessary to construct additional elements of the collection system leading to Bacon Park Pumping Station to serve presently unsewered areas. Collection systems will be required in Thunderbolt and Causton Bluff.

The construction required for 1985 is:

Bacon Park Trunk sewers and pumping station	\$ 586,000.
Thunderbolt Trunk sewers and pumping station	\$1,051,000.
Causton Bluff Trunk sewers and pumping station	\$ 176,000.

Annual Cost of Operations:

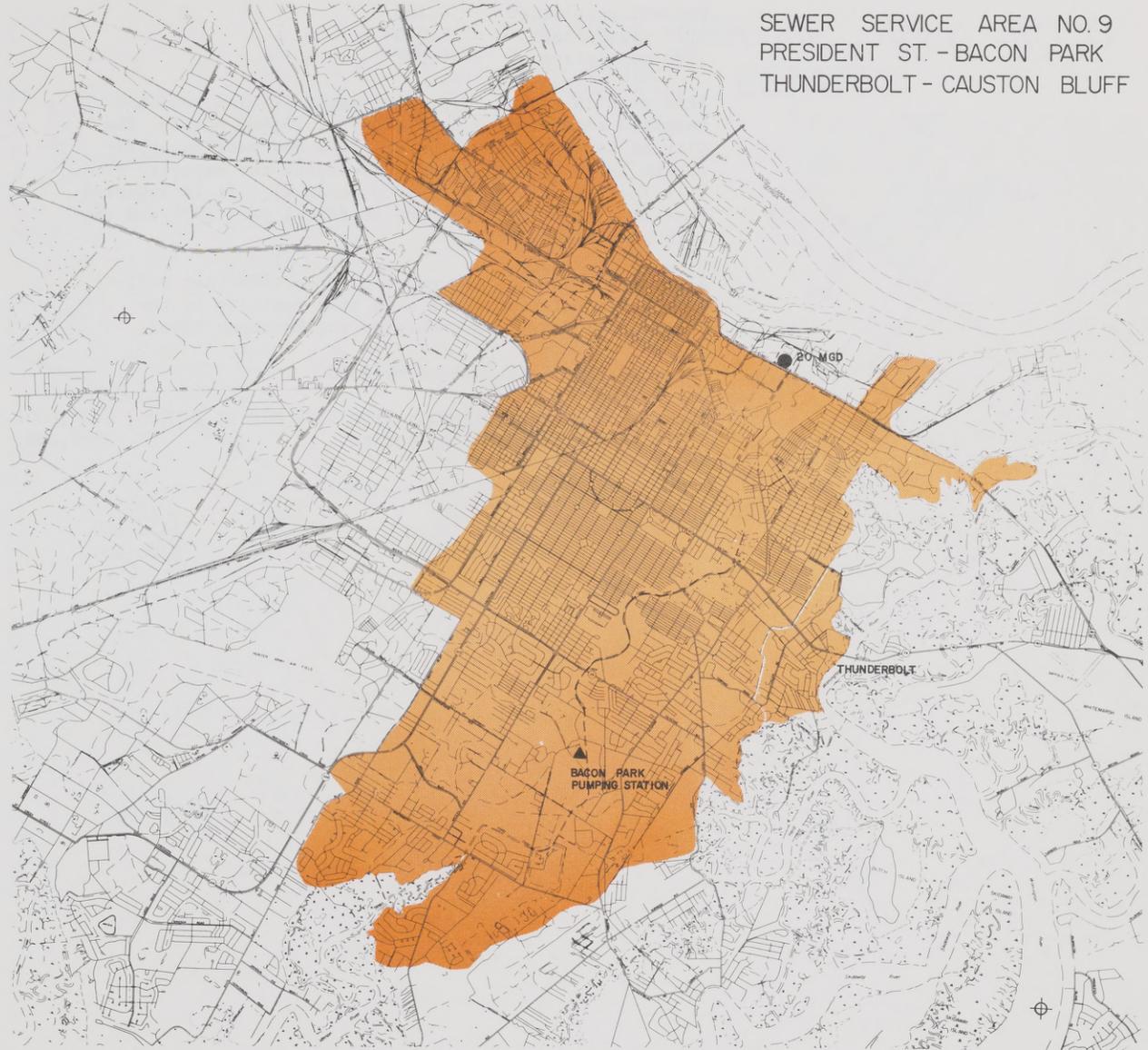
	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$780,000.	\$800,000.
Collection System	\$780,000.	\$800,000.

SEWER SERVICE AREA NO. 9
PRESIDENT ST. - BACON PARK
THUNDERBOLT - CAUSTON BLUFF



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



10. Wilshire Estates

Present population - 8,100
1979 population - 15,000
1985 population - 20,000

This area is served by a waste stabilization pond and aeration chamber with a capacity of 10,800 people. The City of Savannah has prepared plans and made an application for a federal grant to increase the capacity of this facility to 2 MGD (20,000 persons). It is expected that this grant will be made in fiscal year 1974 and the work completed in 1974.

A pumping system is now under construction that will pump the treated effluent from this facility to the Springfield Canal and thence to the Savannah River.

Sewerage Facilities Needed by 1985.

Increase treatment capacity from 1.08 MGD to 2 MGD \$430,000.
Trunk Sewers and Pumping Station \$560,000.

Annual Cost of Operation

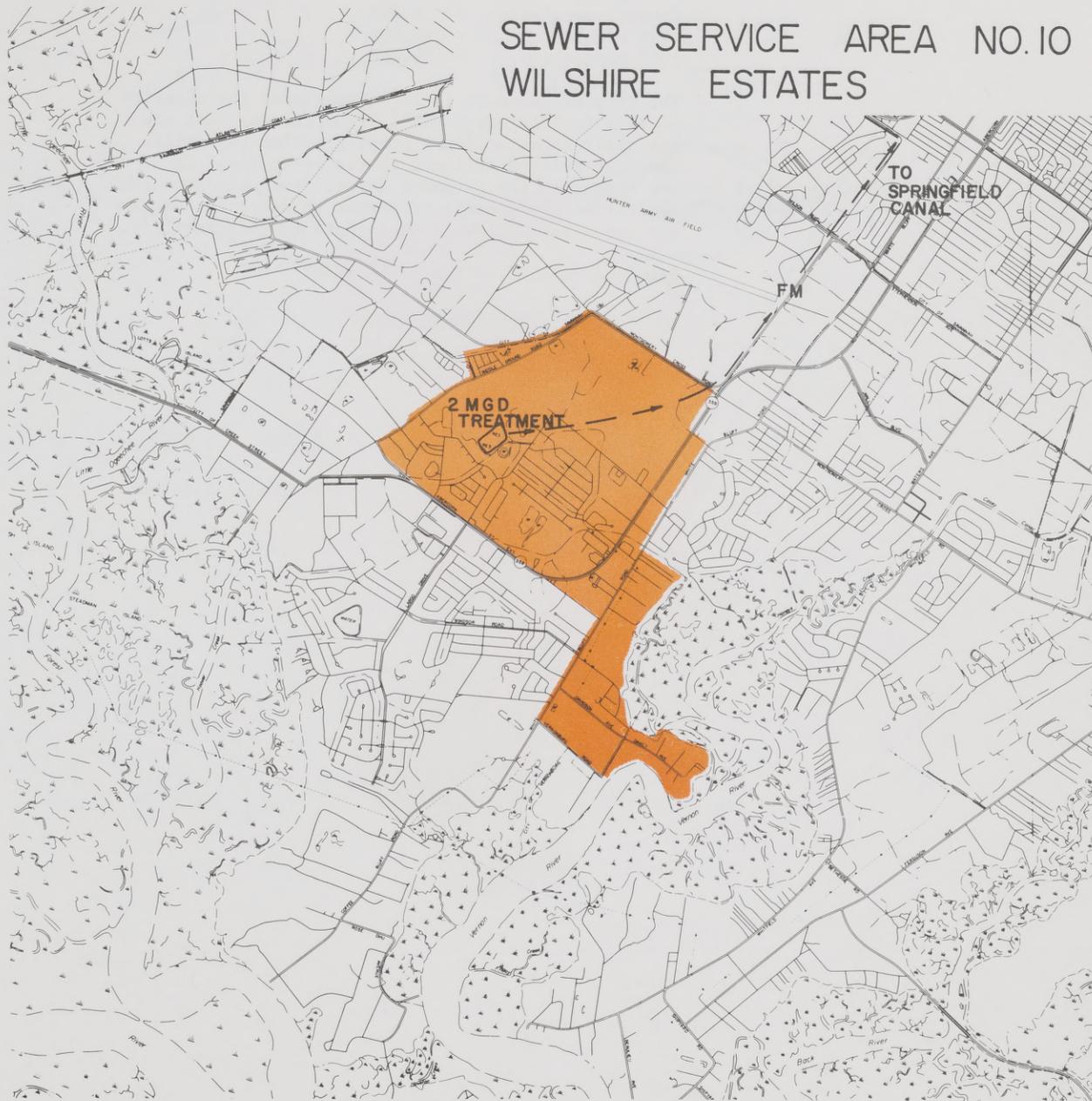
	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$50,625.	\$125,000.
Collection System	\$40,500.	\$100,000.

SEWER SERVICE AREA NO. 10 WILSHIRE ESTATES



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



11. Windsor Forest

Present population - 8,400
1979 population - 20,000
1985 population - 30,000

The City of Savannah in 1972, increased the capacity of this facility to 3 MGD (30,000 persons) and now has under construction a pumping system that will pump the treated effluent to the Springfield Canal and thence to the Savannah River. Extensions to the collection system will be needed to serve the areas now unsewered that will contribute to this facility.

Sewerage Facilities Needed by 1985

Collection System:

New Trunk & Lift Station \$904,000.

Annual Cost of Operation

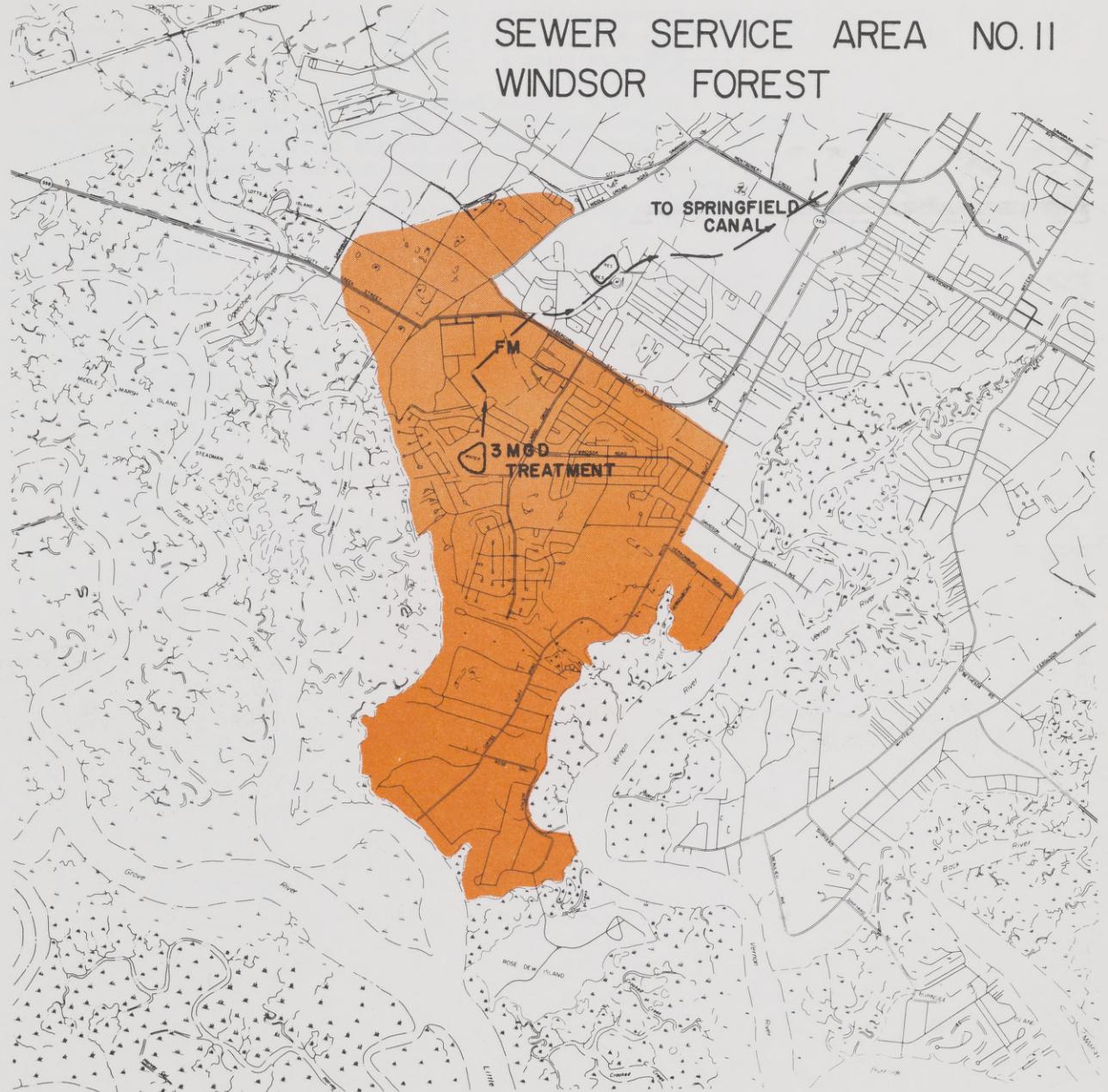
	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$52,500.	\$187,500.
Trunk Sewers and Lift Station	\$42,000.	\$150,000.

SEWER SERVICE AREA NO. II WINDSOR FOREST



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



12. Montgomery

Present population - 1,200
1979 population - 3,000
1985 population - 4,400

This area includes Burnside Island, Rio Vista, Pin Point, Vernon View, Montgomery and Beaulieu, and has no sewers. To provide for adequate service by 1985, a complete collection and treatment system must be constructed.

Sewerage Facilities Needed by 1985

New Treatment Facilities	\$594,000.
New Trunk Sewers and Lift Station	\$994,400.

Annual Cost of Operation

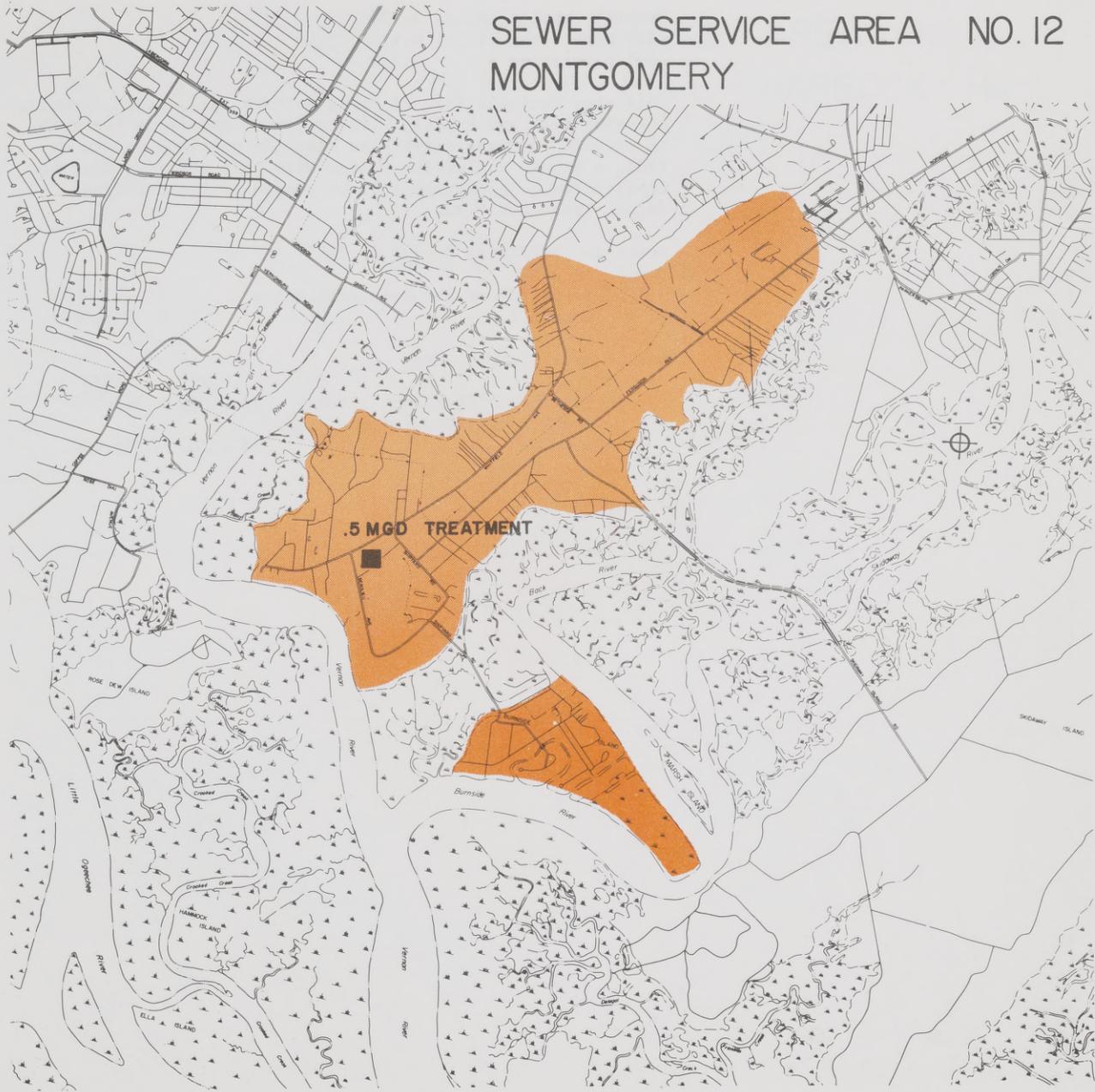
	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$ 0	\$33,000.
Trunk Sewers and Lift Station	\$ 0	\$22,000.

SEWER SERVICE AREA NO.12 MONTGOMERY



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



13. Isle of Hope

Present population - 3,532
1979 population - 4,455
1985 population - 4,720

This area includes Isle of Hope, Harrock Hall, Cedar Hammock, Lakeside Park and Sandfly. There are no sewers in the area. To provide adequate service to meet the expected growth by 1985, a sewage collection system with lift stations must be constructed. The sewage will be pumped to the President Street Treatment Plant.

Sewerage Facilities Needed by 1985

Trunk Sewers and Pumping Station	\$1,483,000.
Laterals	\$ 895,000.

Annual Cost of Operation

	<u>1979</u>	<u>1985</u>
Treatment (President Street)	\$34,500.	\$42,500.
Trunk Sewers and Pumping Station	\$27,300.	\$34,000.

Oatland Island - Whitemarsh - Bradley Point

Present population - 500
1979 population - 5,000
1985 population - 5,000

East Pines on Oatland Island is expanding. A 105 acre tract on Bradley Point is being developed, and a 500 acre tract on Whitemarsh is ripe. This area is so convenient that its development is inevitable. The Savannah Yacht and Country Club has a private small system that should be abandoned. The water surrounding this area are intensively used for recreation and fishing. Therefore, tertiary treatment is required. A single treatment facility should be built to serve the entire area.

Sewerage Facilities Needed for 1985

New Treatment Facilities	\$ 960,000.
New Trunk Sewers and Pump Station	\$1,595,000.

Annual Cost of Operation

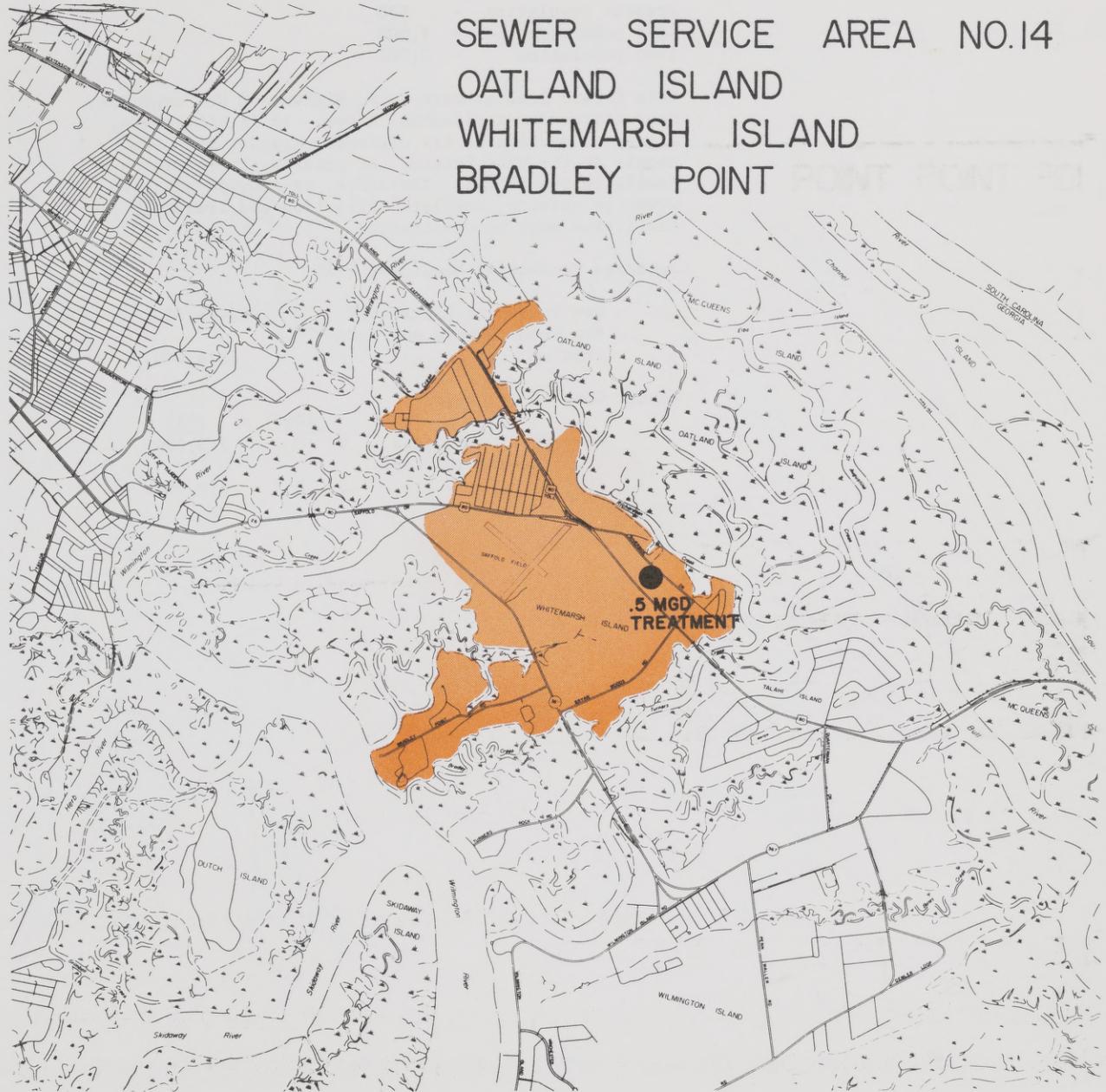
	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$38,000.	\$38,000.
Trunk Sewers and Pump Station	\$25,000.	\$25,000.



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND

SEWER SERVICE AREA NO.14
 OATLAND ISLAND
 WHITEMARSH ISLAND
 BRADLEY POINT



15. Talahi Island

Present population - 500
 1979 population - 1,000
 1985 population - 2,000

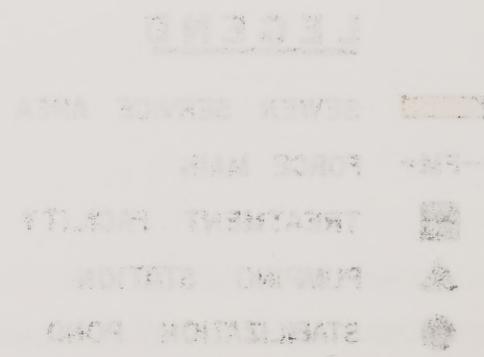
This island lies athwart U. S. Highway 80 and contains many attractive residential sites. It is, therefore, likely to develop to its ultimate capacity of 3,000 people in the near future. At present, there are no sewers on the island. Therefore, to provide adequate sewerage service, complete collection and treatment facilities must be constructed.

Sewerage Facilities Needed by 1985

New Treatment Facilities	\$498,000.
New Trunk Sewers and Lift Station	\$514,000.

Annual Cost of Operation

	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$ 0	\$13,500.
Trunk Sewers and Lift Station	\$ 0	\$10,000.

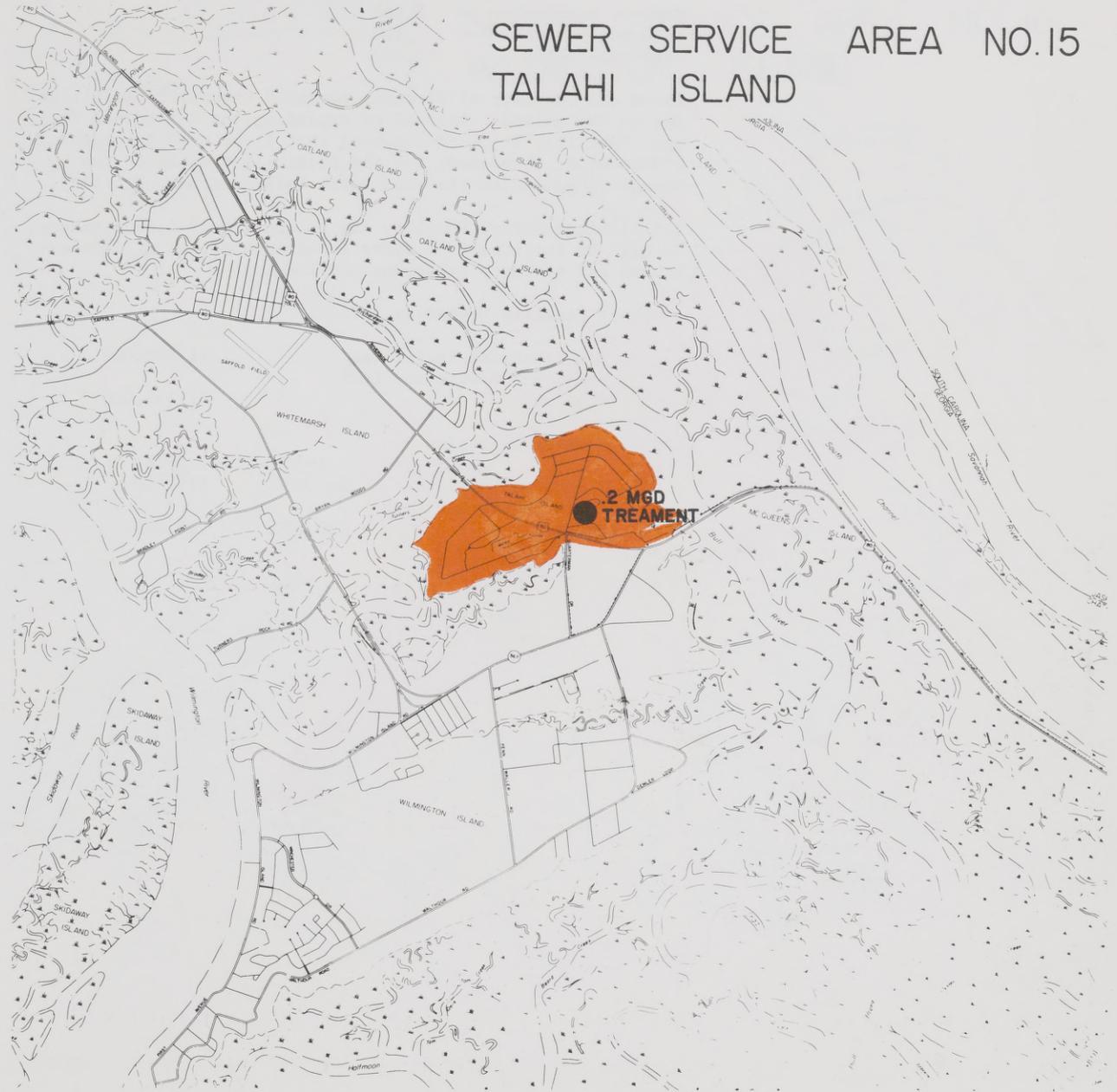


SEWER SERVICE AREA NO.15 TALAHI ISLAND



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



16. Wilmington Island

Present population - 2,400
1979 population - 7,200
1985 population - 12,200

There are two City of Savannah operated treatment facilities now on the island. Instead of expanding the Islandwood Treatment Facility, it is recommended that it be used for partial treatment or abandoned, and the partially treated or raw sewage be pumped to the Wilmington Park Treatment Facility.

The Wilmington Park Facility has a capacity of 3,600 persons, it will be inadequate to serve future demand and will be expanded and tertiary treatment provided.

Sewerage Facility Needed by 1985

New Treatment Facilities	\$1,560,000.
New Trunk Sewers and Lift Station	\$1,339,000.

Annual Cost of Operation

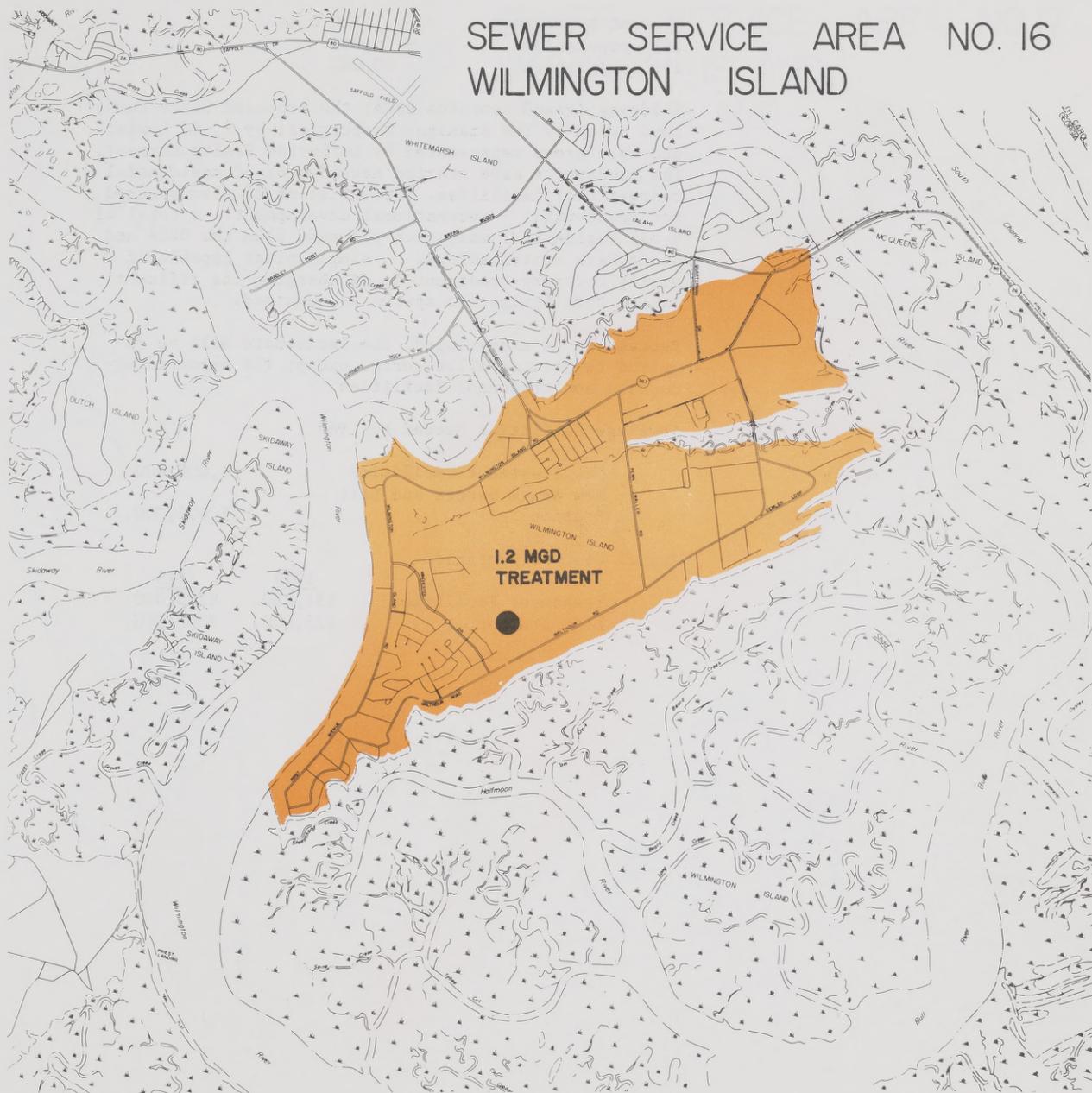
	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$45,000.	\$75,000.
Trunk Sewers and Lift Station	\$36,000.	\$60,000.

SEWER SERVICE AREA NO. 16 WILMINGTON ISLAND



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



17. Skidaway Island

Present population - 100 P.E.
 1979 population - 5,000
 1985 population - 40,000

Skidaway Island contains OSCA; the proposed State Park; land owned by The Branigar Properties; by P. H. Lewis; and by a group represented by Lufburrow Realty Company. The landowners have started development of residential - recreational facilities. Green Island is also planned for residential - recreational development. A total of 9,585 residential units are planned, plus the OSCA and State Park contributions. A single plant capable of giving tertiary treatment or discharging its effluent into a turf irrigation system is required.

Because it is undeveloped, the landowners will be required to provide all sewerage except the major interceptors and treatment facilities.

Sewerage Facilities Needed by 1985

New Treatment Facilities	\$4,000,000.
New Trunk Sewers and Lift Station	\$5,000,000.

Annual Cost of Operation

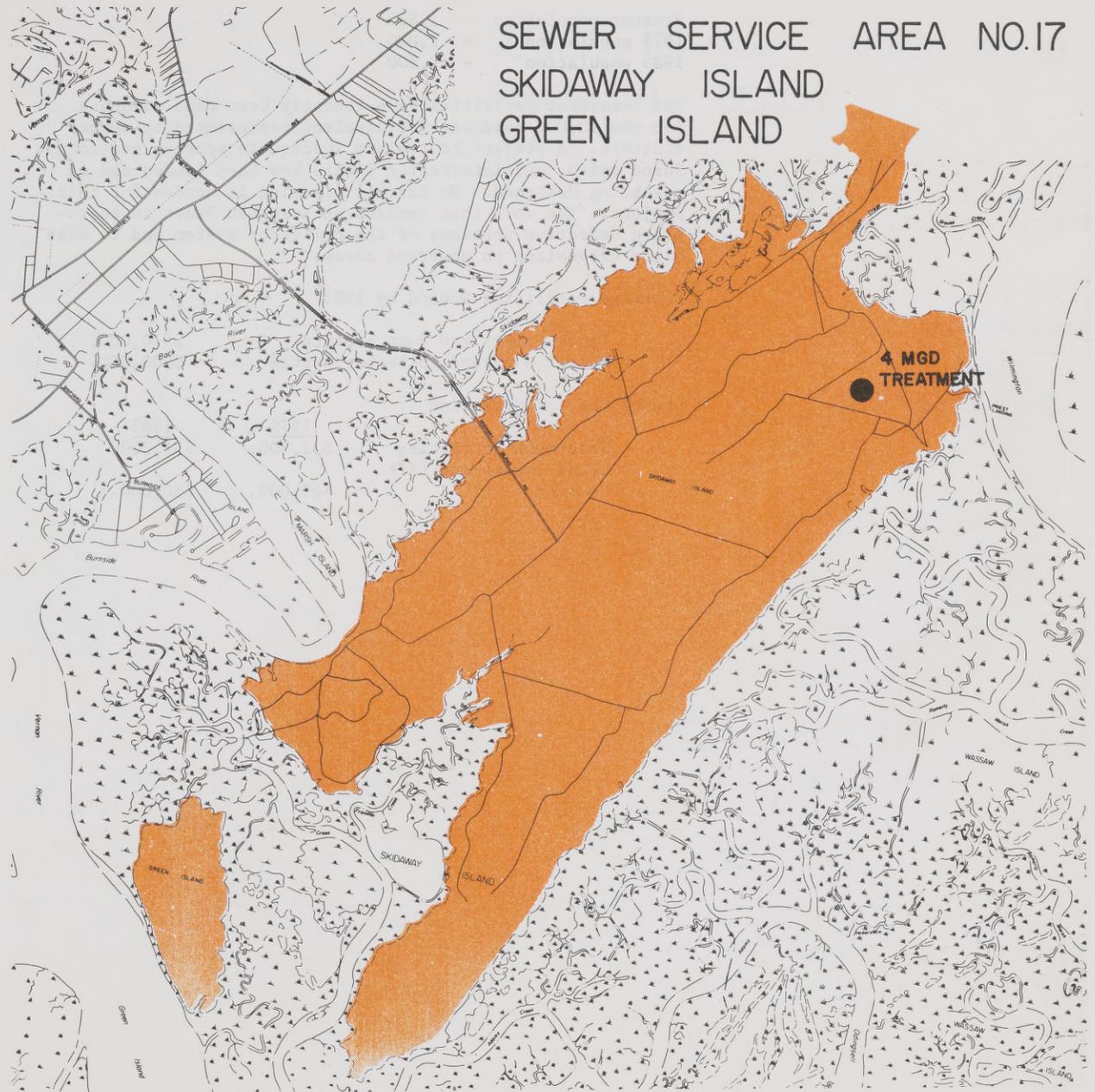
	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$31,250.	\$250,000.
Lift Station	\$25,000.	\$200,000.

SEWER SERVICE AREA NO.17
 SKIDAWAY ISLAND
 GREEN ISLAND



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



18. Savannah Beach

Present population - 1,800
 1979 population - 2,000
 1985 population - 2,500

The treatment facilities have recently been made adequate for the 10,000 population equivalent represented by summer visitors. A project to replace inadequate pumping stations, force mains, and interceptor sewers has been funded and is now being designed. No further planning is needed for this project. The work that remains at Savannah Beach is to replace defective portions of the collector system and to make minor extensions to unserved areas.

Sewerage Facilities Needed by 1985

Trunk Sewers and Pump Station	\$570,000.
Repair & extend Collector System	\$200,000.

Annual Cost of Operation

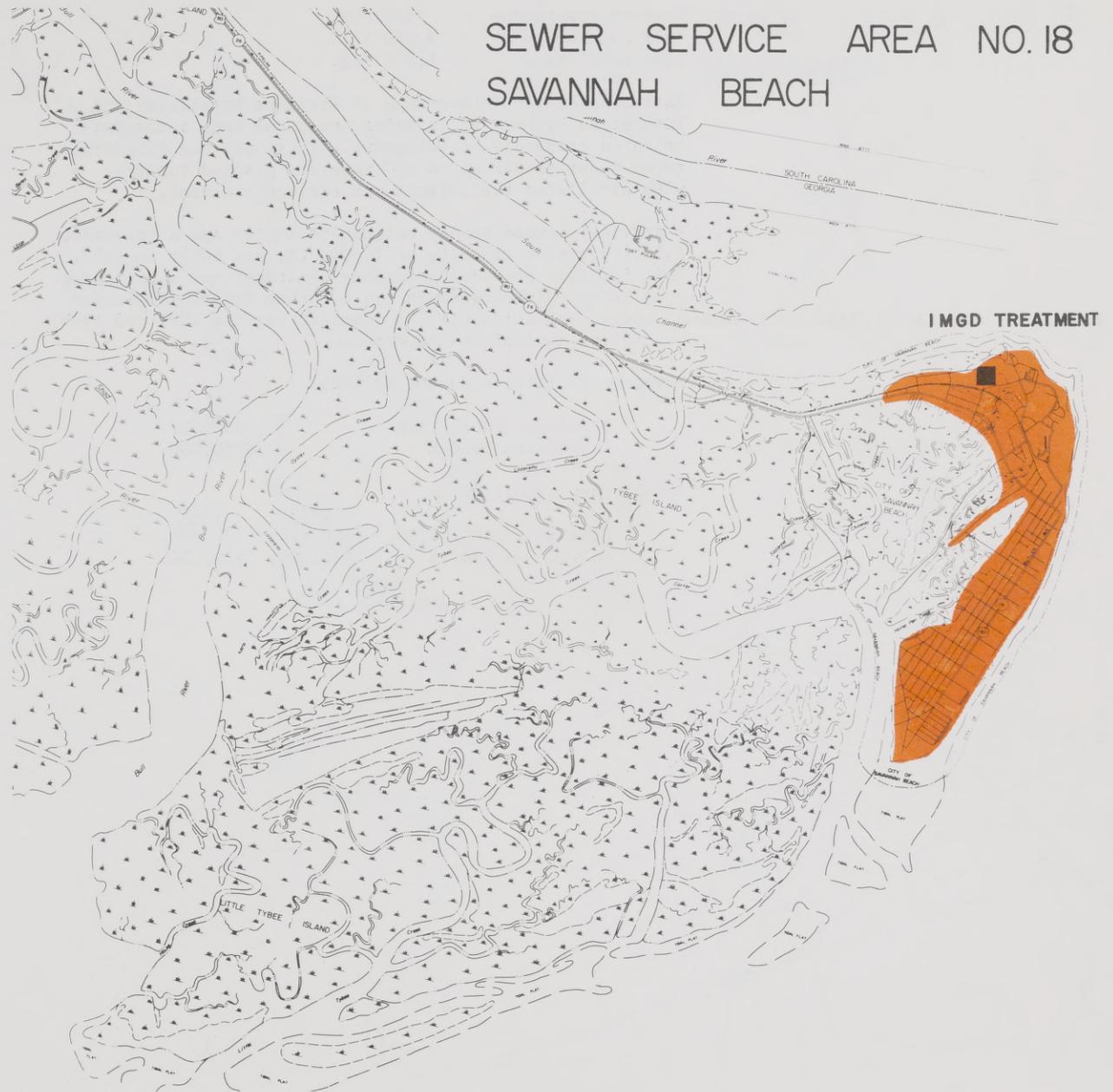
	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$31,300.	\$31,300.
Trunk Sewers and Lift Station	\$30,000.	\$30,000.

SEWER SERVICE AREA NO. 18 SAVANNAH BEACH



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND



19. Gateway Savannah

Present population - 100 P.E.
1979 population - 3,300 P.E.
1985 population - 6,000 P.E.

This area at the Interchange of Abercorn Expressway and Interstate Highway 95 is being developed into a tourist oriented commercial development. There are now 400 motel rooms under construction and more are planned together with affiliated restaurants and service stations.

A privately owned sewage collection system and a treatment facility with a capacity of 1,500 P.E. was built in 1972. This facility provides secondary treatment and a polishing pond before discharge into the Ogeechee River. Expansion of these facilities will be required for the 1979 and 1985 population equivalents expected.

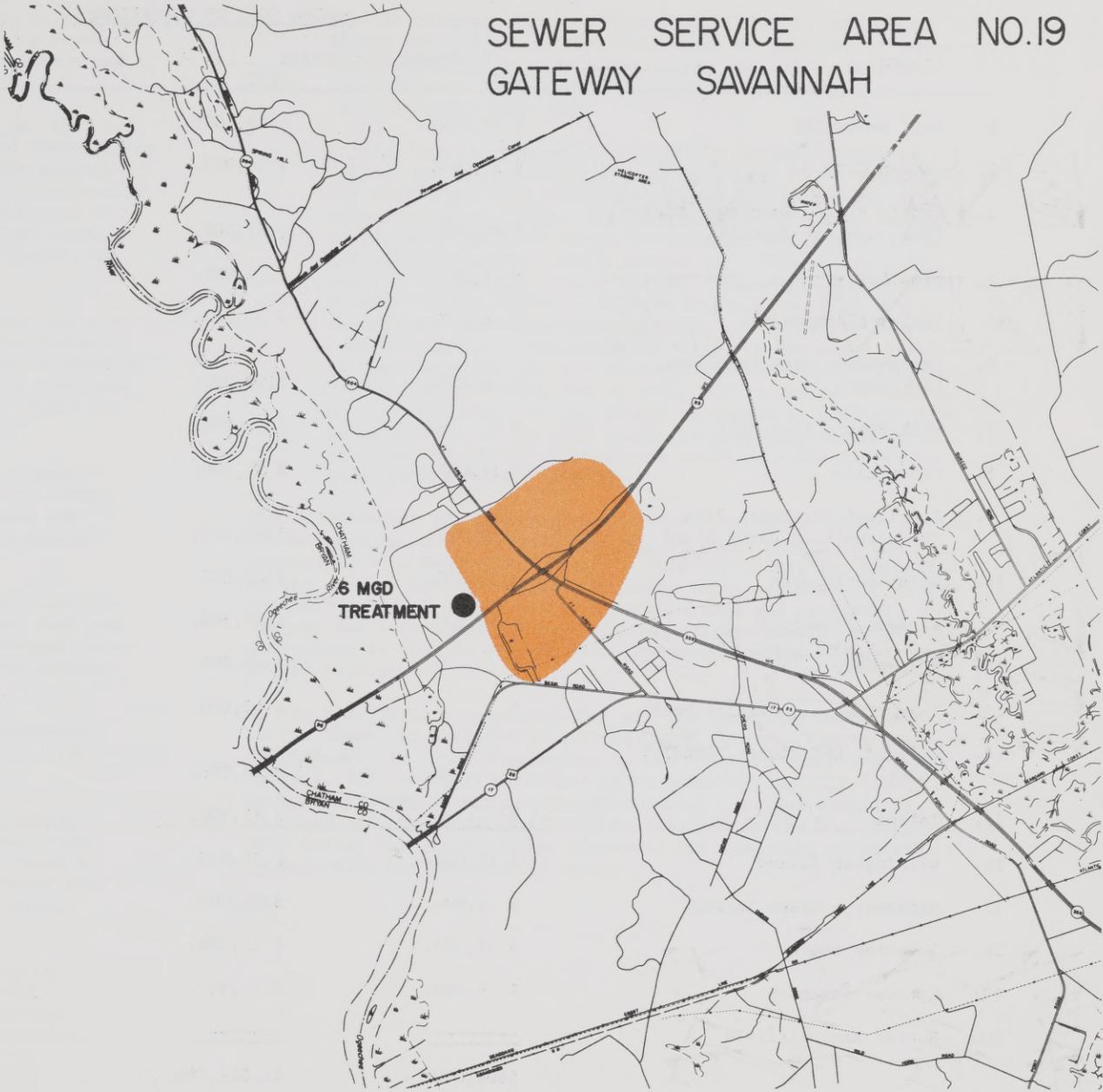
Sewerage Facilities Needed by 1985

Treatment Facilities	\$450,000.
Collection System	\$150,000.

Annual Cost of Operation

	<u>1979</u>	<u>1985</u>
Treatment Facilities	\$20,600.	\$37,500.
Collection System	\$16,500.	\$30,000.

SEWER SERVICE AREA NO.19
GATEWAY SAVANNAH



LEGEND

-  SEWER SERVICE AREA
-  FORCE MAIN
-  TREATMENT FACILITY
-  PUMPING STATION
-  STABILIZATION POND

TABLE IX

ANNUAL COST OF OPERATIONS

System	Treatment Facilities		Collection System	
	1974	1985	1974	1985
1. Port Wentworth	\$ 20,500.	\$ 28,400.	\$ 20,500.	\$ 28,400.
2. Garden City	\$ 35,000.	\$ 40,000.	\$ 35,000.	\$ 40,000.
3. Travis Field, Woodlawn, Sharon Park, Central Junction	\$ 10,000.	\$ 37,500.	\$ 10,000.	\$ 30,000.
4. Pine Forest	\$ 1,000.	\$ 2,000.	\$ 1,000.	\$ 2,000.
5. Pooler-Bloomingtondale	\$ 8,500.	\$ 50,000.	\$ 8,500.	\$ 40,000.
6. Georgetown, Ogeechee Farms, Larchmont	\$ 6,250.	\$100,000.	\$ 5,000.	\$ 80,000.
7. Silk Hope - Pine Hill	\$ 0.	\$ 50,000.	\$ 0.	\$ 40,000.
8. Cloverdale	\$ 14,000.	\$ 87,500.	\$ 14,000.	\$ 70,000.
9. President St., Bacon Park, Thunderbolt, Causton Bluff	\$350,000.	\$800,000.	\$700,000.	\$800,000.
10. Wilshire Estates	\$ 50,600.	\$125,000.	\$ 40,500.	\$100,000.
11. Windsor Forest	\$ 52,500.	\$187,500.	\$ 42,000.	\$150,000.
12. Montgomery	\$ 0.	\$ 33,000.	\$ 0.	\$ 22,000.
13. Isle of Hope - Harrock Hall	\$ 0.	\$ 42,500.	\$ 0.	\$ 34,000.
14. Oatland, Whitmarsh, Bradley Point	\$ 0.	\$ 38,000.	\$ 0.	\$ 25,000.
15. Talahi	\$ 0.	\$ 13,500.	\$ 0.	\$ 10,000.
16. Wilmington Island	\$ 15,000.	\$ 75,000.	\$ 12,000.	\$ 60,000.
17. Skidaway - Green Islands	\$ 4,000.	\$250,000.	\$ 4,000.	\$200,000.
18. Savannah Beach	\$ 31,300.	\$ 31,300.	\$ 30,000.	\$ 31,300.
19. Gateway Savannah	\$ 9,400.	\$ 37,500.	\$ 7,500.	\$ 30,000.
20. Hunter Army Airfield	-----	-----	-----	-----
	\$608,050.	\$2,028,700.	\$930,000.	\$1,792,700.

CHAPTER SUMMARY

In this study, the needs of the water and sewer systems in the County have been presented. Some of these systems are owned by municipalities, some by private organizations, and some are not yet in existence.

The inventory of existing facilities and the needs for 1985 are relatively straight forward. The financing of these improvements are the most critical element of the plan. The Water Quality Control Act of 1972 and its amendments, advise that considerable help can be given in the form of grants of 75% of the cost of treatment facilities and collector sewers in developed areas. This Act and its programs have not been adequately funded, so its value is questionable.

It is recommended that applications be made for grants for projects needed immediately and the schedule of construction be based upon the date grants will be made. It is also recommended that a policy be established regarding the raising of the local funds necessary to match these grants. This policy should include:

1. A uniform user charge for water and sewer service throughout the County, except within the City limits of Savannah. The rates recommended are those now charged by the City of Savannah for service outside the City limits.
2. In each Sewer Service Area a portion of the construction cost (the difference between the actual cost per connection and the approximately \$900 in Revenue Bonds the rates will finance) should be made up by tapping or connection fees.

The fee should be paid as a lump sum in undeveloped areas, and as a lump sum or financed over the life of the Revenue Bonds in the developed areas.

3. In an area where the present owners wish to retain ownership of the water system with the County wide agency providing sewerage, the sewer rates would be high enough to finance the sewer system without the built-in supplement afforded by the water rates.
4. A municipality or private enterprise wishing to retain ownership and operation of a water and sewer system would be required to conform to the rules and regulations of local and state agencies;

provide adequate fire protection according to NBFU criteria; design the systems so that they could be extended to serve the areas shown on this plan; extend the system to serve areas outside their system or subdivision limits when it is financially feasible.

5. In planning new treatment facilities, Community Officials should keep in mind that the ultimate goal is to eliminate all discharges into estuaries and canals flowing through inhabited areas. This will require pumping the effluents to the Savannah River or to turfed areas where vegetation and the soil bacteria will utilize it. This policy will apply to Wilmington Island, Talahi, Whitemarsh, Montgomery, Windsor Forest, Wilshire Estates, Cloverdale, Silk Hope, Georgetown, and Pooler-Bloomingtondale. It is likely that the cost of pumping to the Savannah River and the small quantity of flows expected by 1985 will make this method of disposal impractical for execution by 1985, but it should be used as an ultimate goal. Spray irrigation should be used for disposal wherever a new golf course is proposed, or where an existing one can be utilized, or where suitable turfed or wooded areas can be acquired.

The coordination and administration required to issue bonds, obtain federal grants, and determine priority of needs points to the desirability of a County wide agency. More important, the operation of the complex facilities that are being built now and will be required by this plan must use skilled personnel and equipment. It is just not economical for several small organizations to have these resources; if this is allowed, the consequence might well be neglect of the facilities.

It is, therefore, recommended that all the water and sewer systems in the County be operated by a County wide agency. There are about \$35,000,000 in Bonds outstanding on the existing water and sewer systems. If the legal restrictions on transferring this liability to a County wide agency are insurmountable, a method should be arranged so that ownership could be retained in the municipality that issued the Bonds, and an agreement for operating responsibility be made with the County wide agency.

CHAPTER IV
SIX YEAR PLAN

This portion of the report presents cost of needed water and sewerage system improvements for the municipalities and service districts of Chatham County, for the next six years of implementation (1973 - 1979). Previous portions of the comprehensive planning program for water and sewer includes the following:

A Plan for Water and Sewer (Ga. P-56), published October 1968;

Water and Sewer Financial Plan (Ga. P-128), published December 1969;

Water and Sewerage Improvements Needed in 1975 in Chatham County, Ga. (Ga. p-128), published in March; and

A Plan for Water and Sewer (Ga. P-154), revised in June 1971.

The initial "Plan for Water and Sewer" outlined a program of pollution abatement and water services extension, to presently populated areas and additional areas where population was projected by 1985. The "Water and Sewer Financial Plan" recommended methods of financing needed improvements over a long term, and suggested organizational structures which could implement the pollution abatement program.

The "Water and Sewerage Improvements Needed in 1975 in Chatham County, Ga." showed estimates of cost and facilities that would be required in the five year period 1970-1975. The revised 1971 "Plan for Water and Sewer" updated these three previous planning documents. The present report highlights water and sewer improvements most urgently needed during the next six years to implement the current program. Water improvements are described in the latter portion. Improvements described in this report directly correlate with the previous planning documents on water and sewer improvements. Water supply and sewerage collection district boundaries shown in this report have been changed from those shown in previous reports to reflect changed conditions. Preliminary engineering drawings at a scale of 1"=400', showing the location of the major improvements, have been revised by the consulting engineers as a part of this 1973 edition of A Plan for Water and Sewer. Detailed Estimates of the Cost are shown as Exhibit "A", included in a separately published technical

document. Copies of the detailed engineering maps and of Exhibit "A" To Comprehensive Water and Sewer Plan 1979 - 1985 For Chatham County, Georgia, (May 1973) are on file with the Metropolitan Planning Commission. Exhibit "A" is a detail cost estimate for the needed water and sewer improvements between the years 1973 and 1979, and provides general estimates of cost of water and sewer needs to serve the 1985 developed areas.

TABLE X

WATER SERVICE EXPANSION IN CHATHAM COUNTY
(SUMMARY OF COST ESTIMATES)
1973-1979

<u>System</u>	<u>Total Cost</u>
1. City of Savannah	
a. Wilshire-Windsor Area	\$ 265,000.
b. Bacon Park Area	\$ 260,000.
c. Cloverdale Area	\$ 904,000.
d. Causton Bluff	\$ 229,000.
2. Savannah Beach	\$ 69,000.
3. Wilmington Island - Talahi	\$ 698,000.
4. Skidaway Island	\$2,148,000.
5. Isle of Hope	\$1,345,300.
6. Woodlawn - Central Junction	\$ 442,000.
9. Georgetown	\$ 830,000.
10. Gateway Savannah	\$ 264,000.
11. Thunderbolt	\$ 204,000.
12. Otland Island	\$ 84,000.
16. Whitmarsh & Bradley Point	\$ 257,000.
18. Bloomingdale-Pooler	\$ 668,000.
TOTAL	\$8,666,300.

Summary of Water Improvements

Area 1: City of Savannah Systems

Extend the system in the Windsor-Wilshire areas to the south and west along the Abercorn Expressway. Extend the system in the Bacon Park area to provide fire protection in the Oakdale area and the developing areas south of Stevenson Avenue.

Extend the system west and south in the Cloverdale area to serve Tremont Park, Liberty City, Summerside and Pulaski Park area. Construct a well and 300,000 gallon elevated storage tank.

Extend the system to Causten Bluff and construct a new well there.

Estimated Cost \$1,658,000.

Area 2: Savannah Beach

Extend system to provide fire protection in the north and western perimeters of the City.

Estimated Cost \$ 69,000.

Area 3: Wilmington Island - Talahi

Extend water to developing areas. Construct elevated storage tank, new well, and increase capacity of existing well.

Estimated Cost \$ 698,000.

Area 4: Skidaway Island

Provide water distribution system for residential units being developed by the land owners of Skidaway and Green Islands. Construct 1 MG elevated storage tank and an additional well.

Estimated Cost \$2,148,000.

Area 5: Isle of Hope

Construct water system that will provide fire protection and adequate domestic supply. Construct new well; elevated storage tank; connect to City of Savannah system; purchase or duplicate existing water systems.

Estimated Cost \$1,345,300.

Area 6: Woodlawn, Sharon Park, Central Junction

Construct system that will provide fire protection and adequate domestic supply, including new well and 200,000 gallon elevated storage tank.

Estimated Cost \$ 368,500.

Area 9: Georgetown

Provide water distribution system to approximately 2,100 residential units being developed, including two new wells.

Estimated Cost \$ 830,000.

Area 10: Gateway Savannah

Construct 500,000 gallon elevated storage tank and extend water lines to serve new motels.

Estimated Cost \$ 264,000.

Area 11: Thunderbolt

Construct new well and extend fire protection to unprotected areas.

Estimated Cost \$ 204,000.

Area 12: Oatland Island

Construct new well and extend water lines to developing areas.

Estimated Cost \$ 84,000.

Area 16: Whitemarsh Island and Bradley Point

Connect to Savannah Yacht and Country Club Estates system, construct new well, and extend the distribution system to serve the developing areas.

Estimated Cost \$ 257,000.

Area 18: Bloomingtondale - Pooler

Connect the two city systems with a 12 inch line, construct a 500,000 gallon elevated storage tank, two new wells, and extend the water system to the I-95 Interchange.

Estimated Cost \$ 668,000.

TABLE XI

SEWERAGE FACILITIES EXPANSION
NEEDED IN CHATHAM COUNTY FOR SIX YEAR PERIOD
(SUMMARY OF COST ESTIMATES)
1973-1979

Area	Treatment		Main Sewers & Pump Station		Collection	
	Cost	Eligible E.P.A. 75% Grant	Cost	Eligible E.P.A. 75 % Grant	Laterials Cost	Total Cost
1. Port Wentworth	-----	-----	-----	-----	-----	-----
2. Garden City	-----	-----	-----	-----	-----	-----
3. Travis Field, Woodlawn, etc.	-----	-----	\$ 636,000.	\$ 489,600.	\$ 308,000.	\$ 944,000.
5. Pooler - Bloomingdale	\$ 347,000.	\$ 260,250.	\$ 721,000.	\$ 540,750.	\$ 563,100.	\$ 1,631,000.
6. Georgetown, etc.	\$ 800,000.	-----	\$ 850,000.	-----	\$ 850,000.	\$ 2,500,000.
8. Cloverdale	\$ 350,000.	\$ 262,500.	\$ 770,000.	\$ 577,500.	\$ 548,000.	\$ 1,668,000.
9. President Street - Bacon Park, etc.	-----	-----	\$ 5,414,000.	\$ 1,145,200.	\$ 816,000.	\$ 6,230,000.
10. Wilshire	\$ 430,600.	\$ 323,000.	\$ 350,000.	\$ 262,500.	\$ 150,000.	\$ 930,600.
11. Windsor	-----	-----	\$ 87,000.	\$ 65,000.	\$ 60,000.	\$ 147,000.
13. Isle of Hope	-----	-----	\$ 1,483,000.	\$ 1,112,000.	\$ 895,000.	\$ 2,378,000.
14. Oatland-Whitemarsh Islands	\$ 960,000.	\$ 720,000.	\$ 1,595,000.	\$ 1,196,000.	-----	\$ 2,555,000.
16. Wilmington Island	\$ 400,000.	\$ 300,000.	\$ 1,739,000.	\$ 1,004,250.	-----	\$ 1,739,000.
17. Skidaway Island	\$ 600,000.	-----	\$ 1,250,000.	-----	-----	\$ 1,850,000.
18. Savannah Beach	-----	-----	\$ 570,000.	427,500.	\$ 200,000.	\$ 770,000.
19. Gateway Savannah	\$ 200,000.	-----	\$ 75,000.	-----	-----	\$ 275,000.
Totals	\$4,087,600.	\$1,865,750.	\$15,140,000.	\$6,820,300.	\$4,390,100.	\$23,617,700.
		POSSIBLE GRANTS				\$ 8,686,050.
						\$14,931,650.

NET COST

NOTE: In District 9 (President Street - Bacon Park - Thunderbolt - Causton Bluff) York lane Interceptor is eligible for a 33% E.P.A. Grant under the former E.P.A. terms. West Side Interceptor, Paulsen Street Interceptor, River Street Interceptor and Causton Bluff Interceptor are part of the City's Pollution Abatement Program which was started prior to the 1972 Water Quality Act and have been decreed to be ineligible for Grants.

The Hopkins - Victory Drive Separation is subject to a HUD Grant, if the funds are still available when the work is started.

In Districts 6 (Georgetown); 17 (Skidaway); and 19 (Gateway Savannah); the sewer systems have been started by private enterprise and are not eligible for E.P.A. Grants.

Summary of Sewer Improvements

Area: District No. 1
Port Wentworth

Treatment Facilities:

1. Existing Facility: Pumping System to Continental Can Company Treatment Plant.
2. Expected population contributing in 1979: 4,600.
3. Improvements needed: None.

Collection System:

1. Expected increase in population (1973 to 1979) - 500.
2. Location of increase: Fill in existing area.
3. Extensions required Laterals for 125 new homes.
(a) Main Sewers and Lift Stations - None
(b) Laterals: To be paid for by tapping fees.

Area: District No. 2
Garden City

Treatment Facilities:

1. Existing Facility: Secondary Treatment Plant.
2. Expected Population contributing in 1979: 7,500.
3. Improvements needed: None.

Collection System:

1. Expected increase in population (1973 to 1979) - 500.
2. Location of increase: Fill in existing area.
3. Extensions required: Laterals for 125 new homes
(a) Main Sewers and Lift Stations - None
(b) Laterals to be paid for by tapping fees.

Area: District No. 3
Travis Field, Woodlawn, Sharon Park, Central Junction

Treatment Facilities:

1. Existing Facility: 1 MG Secondary Treatment Plant.
2. Expected Population contributing in 6 years: 4,500.
3. Improvement required: None.

Collection System:

1. Expected increase in population (1973 to 1979) - 2,200.
2. Location of increase: Woodlawn, Sharon Park, Central Junction.
3. Extensions required:
(a) Main Sewers and Lift Stations \$636,000 E.P.A. Grant \$489,600
(b) Laterals: \$307,950.

Area: District No. 5
Pooler-Bloomingtondale

Treatment Facilities:

1. Existing Facility: .33 MGD Waste Stabilization Pond.
2. Expected Population contributing in 6 years: 5,000.
3. Improvements required: Expand to .5 MGD.
4. Estimated Cost of Improvement: \$347,000. E.P.A Grant \$260,250.

Collection System:

1. Expected increase in population (1973 to 1979) - 2,730.
2. Location of increase: Bloomingtondale and Pooler.
3. Extensions required: Expand system and connect new homes
(a) Main Sewers and Lift Stations \$721,000, E.P.A. Grant \$540,750.
(b) Laterals \$563,100.

Area: District No. 6
Georgetown-Ogeechee Farms-Larchmont

Treatment Facilities:

1. Existing Facilities: None.
2. Expected Population contributing in 1979: 5,150.
3. Improvement required: .7 MGD Tertiary Treatment Facility.
4. Estimated Cost of Facility: \$800,000.

Collection System:

1. Expected increase in population (1973 to 1979): 4,800.
2. Location of Increase: Georgetown.
3. Extensions required: Collection system to serve residential sites.
4. Estimated Cost of Improvements:

(a) Trunk Sewers & Pump Stations	\$850,000.
(b) Laterals	\$850,000.

Area: District No. 8
Cloverdale

Treatment Facilities:

1. Existing Facility: Waste Stabilization Pond with capacity of 4,950. Now has 2,800 contributing.
2. Expected Population contributing in 6 years: 8,000.
3. Improvement required: Convert Pond to Aerated Lagoon with capacity of 8,000 persons.
4. Estimated Cost of Improvements: \$350,000. E.P.A. Grant \$262,500.

Collection System:

1. Expected increase in population (1973 to 1979): 5,200.
2. Location of increase: Pulaski Park, Tremont Park, Summerside, area along Highway 17, and Liberty City.
3. Extensions required: New Collection System

(a) Main Sewers and Lift Stations	\$1,009,300. E.P.A. Grant
	\$ 756,900.
(b) Laterals	\$ 641,600.

Area: District No. 9
President Street, Bacon Park, Thunderbolt, Causton Bluff

Treatment Facilities:

1. Existing Facility: 20 MGD Treatment Plant, with Pumping Station from Bacon Park.
2. Expected Population contributing in 6 years: 156,000.
3. Improvement required: None.

Collection System:

1. Expected increase in population (1973 to 1979) 10,000.
2. Improvement required: Complete interceptor sewers draining to plant from City of Savannah, Thunderbolt and Causton Bluff.
3. Estimated Cost of Improvements:

(a) Main Sewers & Pumping Stations:	
-------------------------------------	--

York Lane Interceptor	\$1,150,000.	33% E.P.A. Grant- \$379,500.
Westside Interceptor	\$1,616,000.	E.P.A. Grant- \$0
Paulsen Interceptor	\$ 792,000.	E.P.A. Grant- \$0
River Street Interceptor	\$ 315,000.	E.P.A. Grant- \$0
Hopkins-Victory Drive Separation	\$ 544,000.	H.U.D. Grant- \$150,000.
Thunderbolt Interceptor	\$ 535,000.	75% E.P.A. Grant- \$401,200.
Causton Bluff Interceptor	\$ 176,000.	E.P.A. Grant- \$0
Bacon Park Collectors	\$ 286,000.	75% E.P.A. Grant- \$214,500
	\$5,414,000.	\$1,145,200.

(b) Laterals:

Bacon Park Area	\$ 300,000.
Thunderbolt	\$ 516,000.
	\$ 816,000.

Area: District No. 10
Wilshire Estates

Treatment Facilities

1. Existing Facility: Waste Stabilization Pond with aeration chamber: capacity of 10,800 population.
2. Expected Population contributing in 6 years: 15,000.
3. Improvement required: Enlarge Aeration Chamber.
4. Estimated Cost of Improvement: \$430,600. E.P.A Grant \$323,000.

Collection System:

1. Expected increase in population (1973 to 1979) 6,900.
2. Location of increase: Apartment sites and filling in existing areas.

3. Extensions required: Expand existing system
- | | | |
|-----------------------------------|------------|---------------|
| (a) Main Sewers and Lift Stations | \$350,000. | E.P.A. Grant- |
| | \$262,500. | |
| (b) Laterals | \$150,000. | |

Area: District No. 11
Windsor Forest

Treatment Facilities:

- Existing Facility: Waste Stabilization Pond and Aeration Chamber, capacity 30,000.
- Expected Population contributing in 6 years: 20,000.
- Improvement required: None.

Collection System:

- Expected increase in population (1973 to 1979) 11,600.
- Location of Increase: Apartments, New Subdivision, and Fill.
- Extensions required: Expand existing system

(a) Main Sewers and Lift Stations	\$87,000.	E.P.A. Grant-
	\$65,000.	
(b) Laterals	\$60,000.	

Area: District No. 13
Isle of Hope-Harrock Hall

Treatment Facilities:

- Existing Facility: None.
- Expected Population contributing in 6 years: 5,460.
- Improvement required: Pump waste to Bacon Park and thence to President Street Plant.
- Estimated Cost of Improvement: None.

Collection System:

- Expected increase in population (1973 to 1979) 5,460.
- Location of increase: Isle of Hope-Harrock Hall-Sandfly.
- Extensions required: New Collection System -

(a) Main Sewers and Lift Stations	\$1,483,000.	E.P.A. Grant-
	\$1,112,000.	
(b) Laterals	\$ 895,000.	

Area: District No. 14
Oatland Island-Whitemarsh Island-Bradley Point

Treatment Facilities:

- Existing Facility: Small package treatment plant on Bradley Point serving the Savannah Yacht and Country Club.
- Expected Population contributing in 6 years: 5,000.
- Improvement required: .5 MGD Tertiary Treatment Plant.
- Estimated Cost of Improvement: \$960,000. E.P.A. Grant-\$720,000.

Collection System:

- Expected increase in population (1973 to 1979) 5,000.
- Location of increase: Oatland Island-Whitemarsh Island-Bradley Point.
- Improvement needed: Construct Trunk Sewers and Pumping Stations. Developers to build laterals.
- Estimated Cost of Improvement: \$1,595,000. E.P.A. Grant-\$1,196,000.

Area: District No. 16
Wilmington Island

Treatment Facilities:

- Existing Facility: Islandwood Aeration Plant with capacity of 1,500 population and Wilmington Park Aeration Plant with capacity of 3,600 population.
- Expected Population contributing in 6 years: 7,200.
- Improvement required: Increase capacity of Wilmington Park abandon Islandwood.
- Estimated Cost of Improvement: \$400,000. E.P.A. Grant-\$300,000.

Collection System:

- Expected increase in population (1973 to 1979) 4,800.
- Location of increase: Filling and expanded subdivisions.
- Extensions required: Expand Collection System :

- (a) Collector Sewers and Lift Stations \$1,560,000.
 E. P. A. Grant \$1,170,000.
- (b) Laterals - Built by developers

Area: District No. 17
Skidaway Island

Treatment Facilities:

1. Existing Facility: 4 Acre Waste Stabilization Pond.
2. Expected Population contributing in 6 years: 5,000.
3. Improvement required: First increment .5 MGD of 4 MGD Plant.
 Plant to have tertiary treatment capacity
 of 1,000 population.
4. Estimated Cost of Improvement: \$600,000.

Collection System:

1. Expected increase in population (1973 to 1979) 4,900.
2. Location of increase: In OSCA Area State Park, and Residential
Development.
3. Extensions required: Complete Collection System
 (a) Main Sewers and Lift Stations \$1,250,000.
 (b) Laterals - Furnished by developers.

Area: District No. 18
Savannah Beach

Treatment Facilities:

1. Existing Facility: 1 MGD Secondary Treatment Plant.
2. Expected Population contributing in 6 years: 2,000.
3. Improvement required: None.

Collection System:

1. Expected increase in population (1973 to 1979) 200.
2. Location of increase: Filling.
3. Extensions required: Rebuild defective collection system
 (a) Main Sewers and Lift Stations \$570,000. E.P.A. Grant-
 \$427,500.
 (b) Collectors Sewer Repairs \$200,000.

Area: District No. 19
Gateway Savannah

Treatment Facilities:

1. Existing Facility: .15 MGD Secondary Treatment Plant.
2. Expected Population equivalent in 6 years: 3,300.
3. Improvement required: Enlarge plant to .33 MGD.
4. Estimated Cost of Improvement: \$200,000.

Collection System:

1. Expected increase in population (1973 to 1979) 3,300.
2. Location of increase: Add Motels and Restaurants.
3. Extensions required: Extend lines to new sites.
4. Estimated Cost: \$75,000.

TABLE XII

Schedule of Operating Cost - Collection System

	1974	1979	1985
1. Port Wentworth	\$ 18,000.	\$ 20,000.	\$ 28,400.
2. Garden City	\$ 33,000.	\$ 35,000.	\$ 40,000.
3. Travis Field, Woodlawn, Sharon Park, Central Junction	\$ 5,000.	\$ 22,500.	\$ 30,000.
4. Pine Forest	\$ 1,000.	\$ 1,000.	\$ 1,000.
5. Pooler-Bloomingtondale	\$ 8,000.	\$ 25,000.	\$ 40,000.
6. Georgetown-Ogeechee Farms-Larchmont	\$ 2,000.	\$ 26,000.	\$ 80,000.
7. Silk Hope-Pine Hill	\$ 0.	\$ 0.	\$ 0.
8. Cloverdale	\$ 6,000.	\$ 40,000.	\$ 70,000.
9. President St.-Bacon Park- Thunderbolt-Causton Bluff	\$600,000.	\$780,000.	\$800,000.
10. Wilshire Estates	\$ 25,000.	\$ 40,500.	\$100,000.
11. Windsor Forest	\$ 20,000.	\$ 42,000.	\$150,000.
12. Montgomery	\$ 0.	\$ 0.	\$ 22,000.
13. Isle of Hope-Harrock Hall	\$ 0.	\$ 27,300.	\$ 34,000.
14. Oatland-Whitemarsh-Bradley Point	\$ 0.	\$ 25,000.	\$ 25,000.
15. Talahi	\$ 0.	\$ 0.	\$ 10,000.
16. Wilmington Island	\$ 15,000.	\$ 36,000.	\$ 60,000.
17. Skidaway-Green Islands	\$ 5,000.	\$ 25,000.	\$200,000.
18. Savannah Beach	\$ 30,000.	\$ 30,000.	\$ 30,000.
19. Gateway Savannah	\$ 10,000.	\$ 16,500.	\$ 30,000.
20. Hunter Army Airfield	\$-----	\$-----	\$-----
Totals	\$778,000.	\$1,191,800.	\$1,790,400.

TABLE XIII

Schedule of Operating cost - Treatment Facilities

1. Port Wentworth	\$ 18,000.	\$ 20,000.	\$ 28,400.
2. Garden City	\$ 33,000.	\$ 35,000.	\$ 40,000.
3. Travis Field, Woodlawn, Sharon Park, Central Junction	\$ 22,000.	\$ 28,000.	\$ 37,500.
4. Pine Forest	\$ 1,000.	\$ 1,000.	\$ 1,000.
5. Pooler-Bloomingtondale	\$ 5,000.	\$ 31,200.	\$ 50,000.
6. Georgetown-Ogeechee Farms-Larchmont	\$ 10,000.	\$ 31,200.	\$100,000.
7. Silk Hope-Pine Hill	\$ 0.	\$ 0.	\$ 50,000.
8. Cloverdale	\$ 8,000.	\$ 50,000.	\$ 87,500.
9. President St.-Bacon Park- Thunderbolt-Causton Bluff	\$400,000.	\$780,000.	\$800,000.
10. Wilshire Estates	\$ 35,000.	\$ 50,625.	\$125,000.
11. Windsor Forest	\$ 45,000.	\$ 52,500.	\$187,500.
12. Montgomery	\$ 0.	\$ 0.	\$ 33,000.
13. Isle of Hope-Harrock Hall	\$ 0.	\$ 34,500.	\$ 42,500.
14. Oatland-Whitemarsh-Bradley Point	\$ 0.	\$ 38,000.	\$ 38,000.
15. Talahi	\$ 0.	\$ 0.	\$ 13,500.
16. Wilmington Island	\$ 25,000.	\$ 45,000.	\$ 75,000.
17. Skidaway-Green Islands	\$ 10,000.	\$ 31,250.	\$250,000.
18. Savannah Beach	\$ 31,300.	\$ 31,300.	\$ 31,300.
19. Gateway Savannah	\$ 12,000.	\$ 20,600.	\$ 37,500.
10. Hunter Army Airfield	\$-----	\$-----	\$-----
Totals	\$655,300.	\$1,281,475.	\$2,027,700.

FINANCIAL

The financial requirements for providing adequate water and sewerage during the next six years is:

Water	\$8,666,300.
Sewage Treatment	\$4,087,600.
Sewage Collection	<u>19,530,100.</u>
	\$32,284,000.

These costs demonstrate the progress that has been made in constructing sewage treatment facilities by Savannah, Savannah Beach, Port Wentworth and Garden City. They also show that a great deal must be done on the collection systems to get the waste to the treatment facilities now under construction.

Plans and specifications have been prepared and financing arranged for some of the sewer projects and it is likely they will be under construction in 1973. These are:

Sewage Treatment:

Wilshire Estates	\$430,600.
Cloverdale	<u>\$350,000.</u>
	\$780,600.

Sewage Collection:

York Lane Interceptor	\$1,150,000.
Westside Interceptor	\$1,616,000.
Paulsen Street Interceptor	\$ 792,000.
Hopkins-Victory Drive Separation	\$ 544,000.
Savannah Beach Pump Station	<u>\$ 570,000.</u>
	\$4,672,000.

Private enterprise has proceeded with developing systems at Georgetown, Skidaway Island and Gateway Savannah. The requirements for these three systems during the next six years are \$3,242,000 for water, 1,600,000 for sewage treatment and 3,025,000 for sewage collection. Therefore, of the approximately \$32,000,000 needed, \$5,450,000 is already scheduled for construction and \$7,867,000 is for privately owned systems.

Chatham County has made studies to determine the feasibility of constructing water and sewer systems in the following areas:

Wilmington Island
Skidaway Island
Bloomingdale
Isle of Hope and area west of Herb River
Area along U. S. 17, Tremont Park & Pulaski Park
Causton Bluff
Woodlawn, Sharon Park & Central Junction
Summerside Subdivision

It is feasible to construct water and sewerage in all these areas provided the rates charged are high enough. Undeveloped areas of Wilmington Island, Skidaway and Causton Bluff can be readily financed because of financial participation by the land owners. However, developed areas where pollution is actually occurring must be provided for before the newly developing areas in order to qualify for E. P. A. Grants.

The following sewer projects are eligible for 75% E.P.A. Grants of:

Travis Field, Woodlawn, etc.	\$ 489,600.
Pooler-Bloomingdale	\$ 801,000.
Cloverdale	\$ 840,000.
Bacon Park-Thunderbolt	\$ 615,700.
Wilshire Estates	\$ 585,500.
Windsor Forest	\$ 65,000.
Isle of Hope-Harrock Hall	\$1,112,000.
Oatland-Whitemarsh-Bradley Point	\$1,916,000.
Wilmington Island	\$1,304,250.
Savannah Beach	<u>\$ 427,500.</u>
	\$8,156,550.

These Grants cannot be scheduled to be obtained at the communities convenience because the E.P.A. Program is grossly underfunded. It would be prudent to apply for them and let the State Department of Natural Resources establish their priority. Then the community could plan a schedule of construction based upon when the grant would be made. If construction of any project must proceed before grants are available, the funds must be 100% local, and the supporting revenues higher.

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