

UTILITIES ELEMENT

UTILITIES ELEMENT: INTRODUCTION
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Utilities Element: Introduction

This element describes the public facilities which serve the existing demand for water and wastewater services, solid waste disposal, and flood control. It projects future needs correlated to land use patterns as set forth in the Future Land Use Plan and as described in the Capital Improvements Element. The element sets levels of service for such facilities, and identifies future facility expansions necessary to accommodate projected increases in demand. Natural groundwater aquifer recharge areas are discussed in terms of preserving our sole source of water supply, the Biscayne Aquifer. Finally, the element sets forth goals, objectives and policies which guide the Town in effectuating plans necessary to accommodate adopted levels of service for existing and future populations.

Utilities Element: Analysis of Existing Conditions

The Sanitary Sewer, Solid Waste, Drainage, Potable Water, and Natural Groundwater Aquifer Recharge Element will provide an analysis of the availability and impact of these facilities to serve existing and future land uses.

Within the Town of Davie there are four primary service providers for water and wastewater services. The service providers include the Town of Davie, the City of Sunrise, South Broward Utilities Company, and Ferncrest Utilities. See Figure III-1, Utility Service Areas Map.

The Town has executed Interlocal Bulk Water Agreements with the City of Cooper City, the City of Hollywood, the City of Fort Lauderdale, Ferncrest Utilities, and South Broward Utilities. These agreements are largely for the provision of water and wastewater services for fire and emergency purposes. The provision of these services is facilitated by the water and wastewater interconnects the Town maintains with the above providers. With the exception of the City of Fort Lauderdale water system, potable water may be pumped to any location within the Town by any of the other service providers. The Interlocal Agreements provide for reciprocity, where the Town would similarly supply emergency service to other providers.

Water and Wastewater Services

Regulations

Under the Federal Safe Drinking Water Act of 1974, the United States Environmental Protection Agency (E.P.A.) released the National Primary Drinking Water Regulations in 1975. These regulations apply to municipal and non-municipal water systems and establish the maximum allowable levels of inorganic and organic chemicals, turbidity, and radiological and microbiological contaminants.

In accordance with Federal requirements, the Florida Legislature adopted the Florida Safe Drinking Water Act, Sections 403.850-403.864, F.S. This act authorizes the Florida Department of Environmental Protection (F.D.E.P.) to enforce state primary and secondary drinking water regulations. This legislation is applicable to the water system, particularly with respect to required monitoring programs and minimum standards. The Florida Water Act incorporates all standards of the E.P.A. regarding monitoring programs and additional minimum water quality standards.

The South Florida Water Management District (S.F.W.M.D.) regulates withdrawals from the Biscayne Aquifer. The S.F.W.M.D. issues general and individual water use permits for any use, diversion, or withdrawal of any surface or groundwater in the District. The Florida Department of Health and Rehabilitative Services (F.H.R.S.), through its local health unit, issues permits for operation of water plants

subject to compliance with state water quality standards. The primary local drainage districts, the Central Broward Drainage District, and the South Broward Drainage District regulate drainage and indirectly the aquifer recharge. See Figure III-2, Drainage District Service Area map and Figure III-2A, Canal Network map for the jurisdictional responsibility of these districts and canal system.

The Federal Water Pollution Control Act, Public Law 92-500 (1972), is the controlling national legislation relating to provision of sanitary sewer service. This Act is designed to restore and maintain the chemical, physical and biological integrity of the nation's waters. The E.P.A. is responsible for implementing the Act. The state and local regulations have been set forth by the F.D.E.P. under Chapter 403, Florida Statutes, Sec. 17-6, 62-4, 62-600, 62-620, 62-660, of the Florida Administrative Code (F.A.C.), which F.D.E.P. monitors, licenses and regulates.

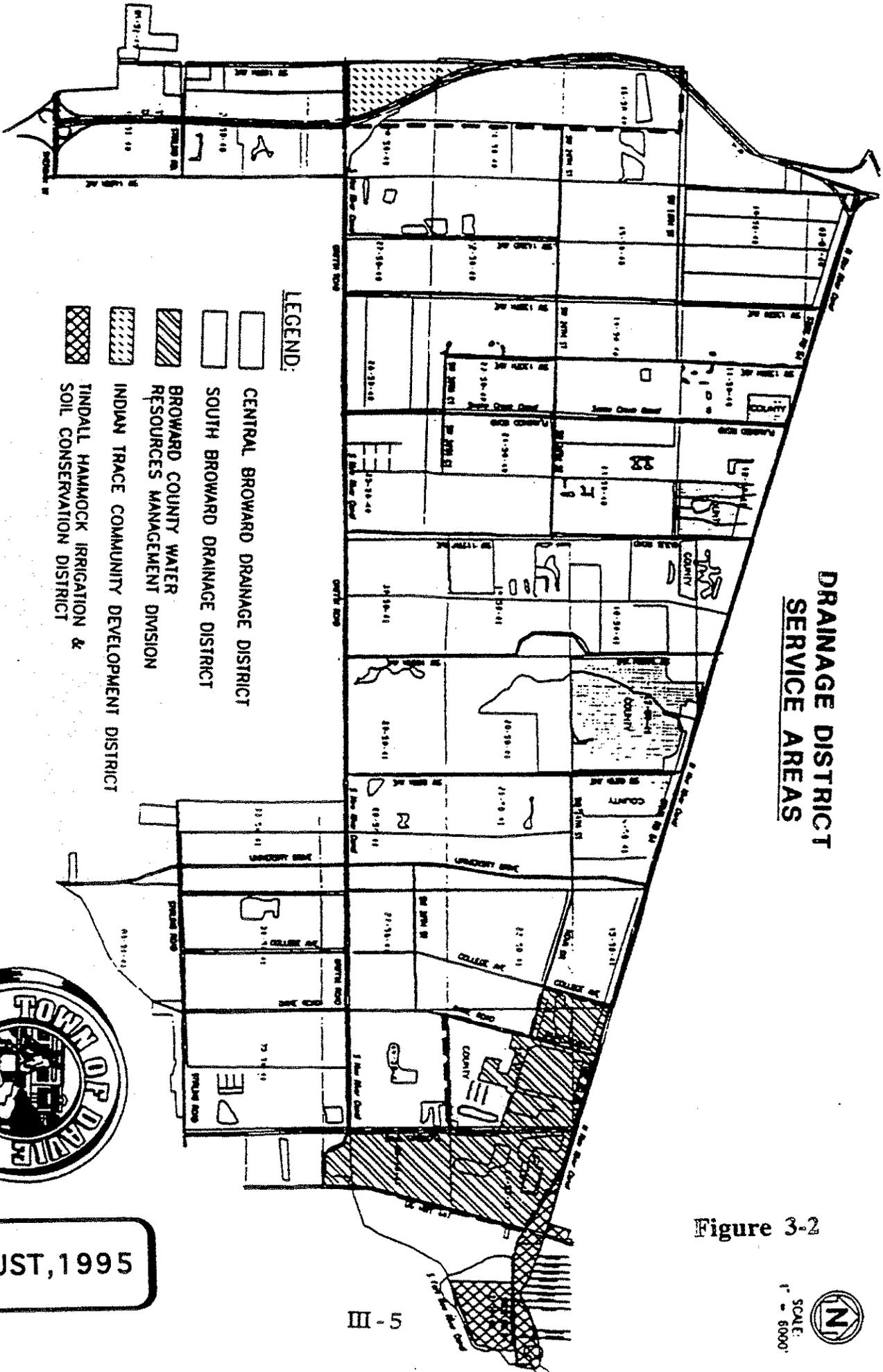
The Broward County Department of Natural Resource Protection (D.N.R.P.), established in 1975 by the Broward County Charter, is responsible for countywide licensing of wastewater treatment plants and monitoring of operating treatment plants to ensure compliance with the D.N.R.P. Code of Regulations. The D.N.R.P. also licenses sludge haulers and ensures that domestic wastewater treatment plant sludge is properly disposed. The F.H.R.S., through its local health unit, issues permits for installation of septic tanks subject to compliance with Chapter 10D-6, F.A.C. and Ordinance 78-50 of the Broward County Code of Ordinances.

Davie Service Area

The Town began its water and sewer operations by the purchase of two privately owned water and sewer systems. The Town physically integrated the two water and sewer systems through water main and sewer force main interconnections and ties so that the systems now function as fully integrated and unified operating entities (herein the "Utility System"). Likewise, the sewer force main interconnects between the two sewer treatment plants allow wastewater flows to be diverted from one plant to another based on varying demands on the respective plants, thus providing a more efficient integrated operation.

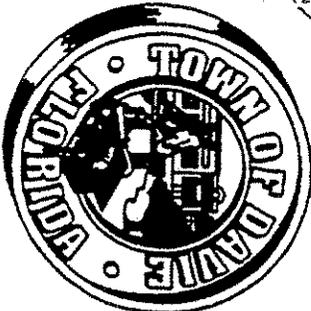
The Town system is divided into two service areas: Service Area One, and Service Area Two. Service Area One can be generally described as the central or original portion of the Town. It is bound on the north by State Road 84, on the south by Stirling Road, on the east by the Florida Turnpike, Ferncrest Utilities, Hacienda Village and the Seminole Indian Reservation; and on the west by University Drive and Pine Island Road. Service Area One contains approximately 8.5 square miles. This area is considered the heart of the Town of Davie and contains the Town Hall, the Downtown Davie District, and the South Florida Education Center. Service Area Two is located along the southern boundary of the Town limits. It is bound on the north by Stirling Road, on the south by Sheridan Street, on the east by the City of Hollywood at Davie Road Extension, and on the west by the Town limits. The area is primarily residential with several large tracts of vacant property.

DRAINAGE DISTRICT SERVICE AREAS



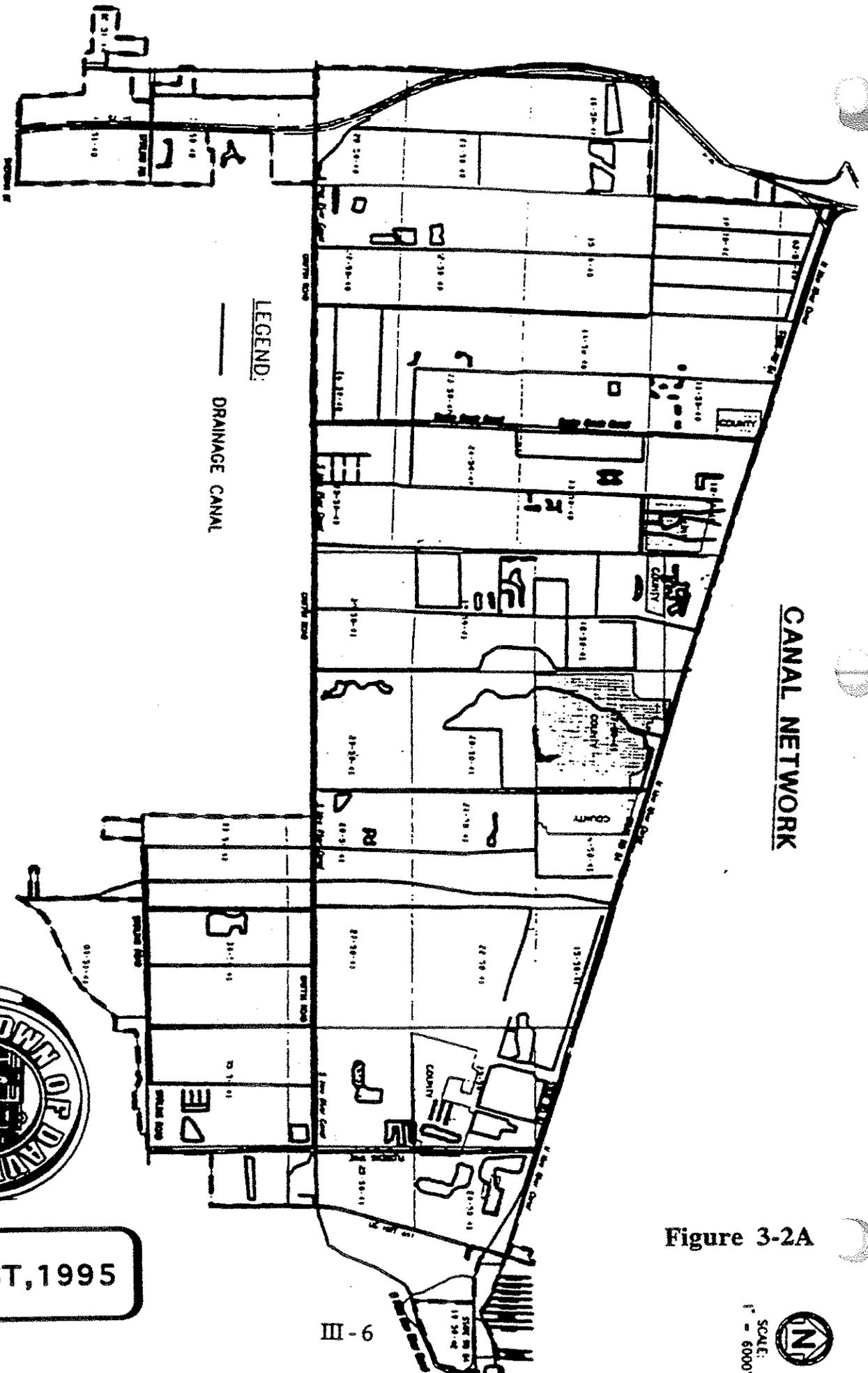
LEGEND:

-  CENTRAL BROWARD DRAINAGE DISTRICT
-  SOUTH BROWARD DRAINAGE DISTRICT
-  BROWARD COUNTY WATER RESOURCES MANAGEMENT DIVISION
-  INDIAN TRACE COMMUNITY DEVELOPMENT DISTRICT
-  TINDALL HAMMOCK IRRIGATION & SOIL CONSERVATION DISTRICT



AUGUST, 1995

Figure 3-2



CANAL NETWORK

LEGEND:

— DRAINAGE CANAL



AUGUST, 1995

Figure 3-2A

III - 6

SCALE:
1" = 6000'

The Town of Davie has operational responsibility for the following facilities:

- System I Water Treatment Plant
- System III Water Treatment Plant
- System II Wastewater Treatment Plants

These systems are integrated and are hereinafter referred to as "water facilities" and "wastewater facilities". The predominant land use served by the Town facilities is residential.

Water Treatment System

The Town presently operates two water treatment facilities (System I and System III). The treatment process at each plant consists of raw water wells, aeration, coagulation, flocculation, sedimentation, fluoridation, filtration, and disinfection. Chemicals utilized include synthetic polymers for coagulation, lime or softening, chlorine for disinfection and hydrofluosilicic acid for fluoridation. Filter wash water is recovered and returned to the process. Sludge is retained in a holding pond dewatered at system III, and hauled off site after buildup. Finished water is then pumped through the distribution system.

Primary infrastructure consist of the following:

- a. Package treatment units
- b. Mixed media rapid flow gravity filters
- c. Control building which houses offices and instrumentation
- d. Laboratory
- e. Chlorination equipment
- f. Fluoridation equipment
- g. Control equipment
- h. High service pumping facilities
- i. Lime silo and slaking facilities
- j. Clearwell and storage
- k. Electric power generation

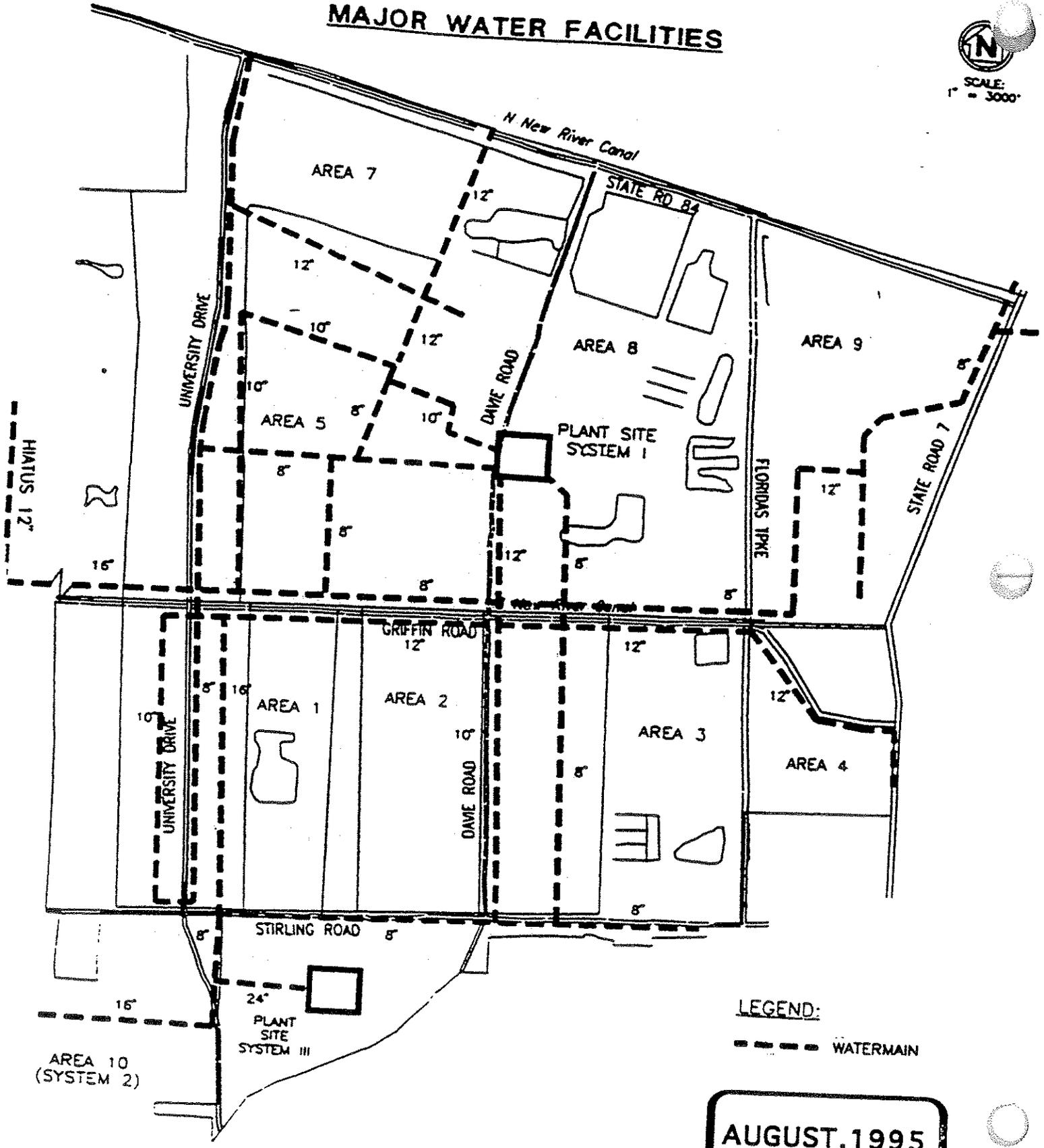
All treatment facilities are in excellent condition, are well operated and maintained, and produce good quality water. The System III wells have been deepened to reduce raw water color. See Figure III-3, Water Facilities map.

The distribution of finished water from the treatment plant to the customer is accomplished by the use of approximately 116 miles of water mains varying in size from 24" diameter down to 6" diameter.

MAJOR WATER FACILITIES



SCALE:
1" = 3000'



LEGEND:

--- WATERMAIN

AUGUST, 1995

Figure III-3

Water main extensions are primarily funded by developers who are required to construct new lines to their developments in accordance with the Town's master plan for the water system. A review of the distribution system indicates it is in good condition and is well maintained.

Wastewater Treatment System

The existing wastewater collection system consists of approximately thirteen localized collection systems, 23 lift stations, approximately nine miles of force main and over 22 miles of gravity sewer lines varying in size from 8" to 24" diameters. The gravity collection system is maintained in an excellent condition by the Utilities Department. All lift stations are in good condition. Master lift station 13, "Publix", and Master lift station 19, "Nova", were recently refurbished. A new section of force main was completed in conjunction with the lift station refurbishment. The pressures in the force main system are now equalized between the western and eastern half of the Town's force main system. Wastewater treatment for Service Areas One and Two is provided by the System II wastewater treatment plant.

The wastewater treatment plant consists of surge control, treatment within field erected prefabricated steel tanks which include contact stabilization, aeration, clarification, re-aeration, digestion, chlorination and final effluent disposal to the Atlantic Ocean via the use of Hollywood's Ocean Outfall Facility, or reuse by Hollywood. The Town of Davie's wastewater plant is currently being expanded from 3 mgd to 5 mgd capacity.

Department of Environmental Regulations requirements provide that secondary treatment achieve at least 90% removal of 5-day biochemical oxygen demand (BOD[5]) and suspended solids (SS). The plant is currently meeting these requirements.

Waste sludge from the plant is dried on vacuum assisted sludge drying beds and is disposed of in an approved manner. See Figure III-4, Wastewater Facilities map.

Design Capacity for Davie Water and Wastewater Plants

water treatment capacity-Systems I & III	7.8 mgd*
wastewater treatment capacity	3.0 mgd

WASTEWATER FACILITIES

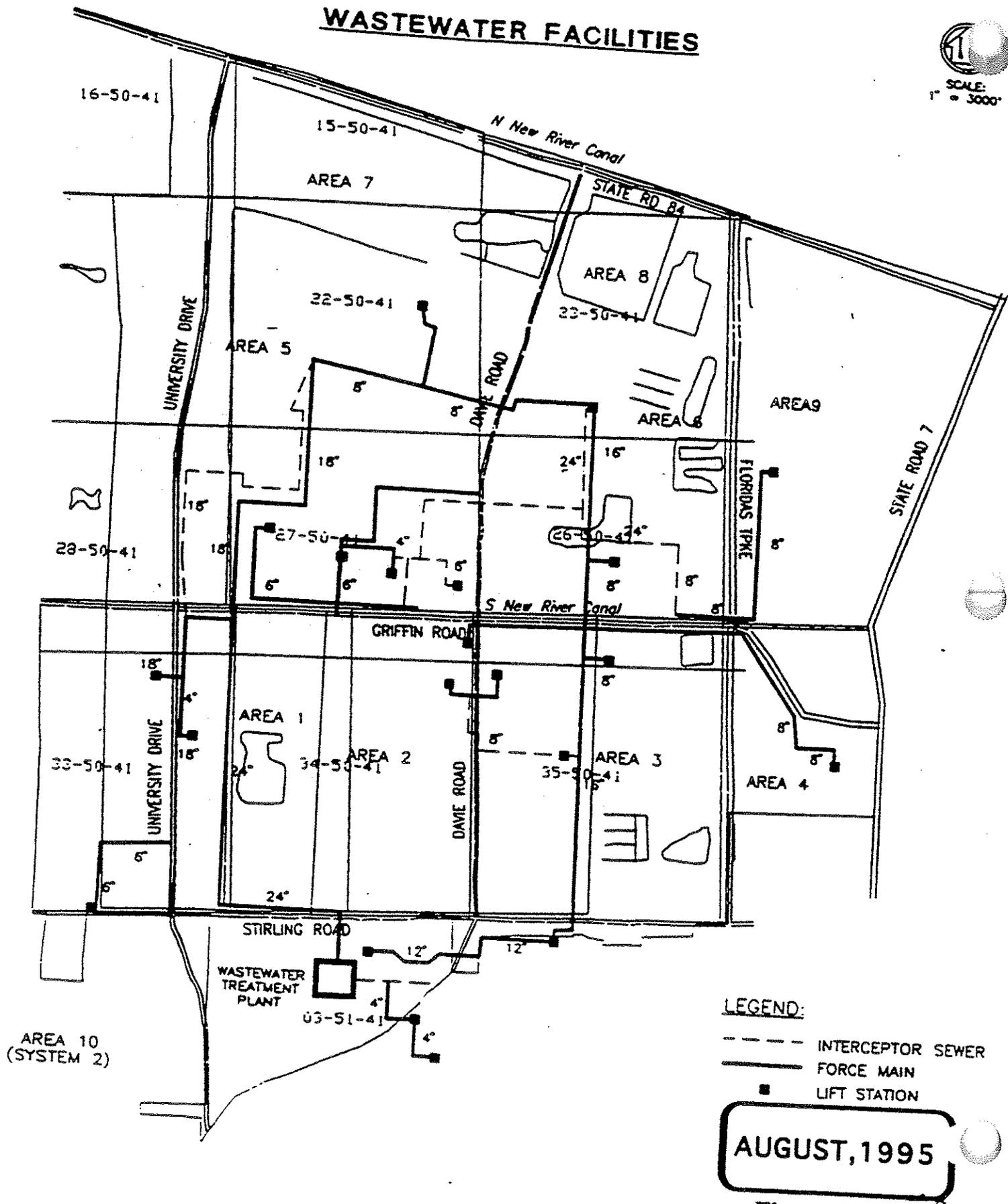


Figure III-4

Demand on the Facility Capacity and Proportional Share	
Actual water treatment demand	2.7 mgd
-Davie proportional share	100%
Actual wastewater treatment demand	2.1 mgd
-Davie proportional share	100%

* million gallons per day

Existing Level of Service (L.O.S.) Standards

A level of service (L.O.S.) is a quantitative measure of a given city function. Comprehensive plans must adopt these quantitative standards and provide the means to meet them as development adds pressure to the existing capacity. The most useful standard for water treatment and distribution is gallons per capita per day (gpcd). This standard is used by the Town of Davie to measure the adequacy of water and wastewater service in meeting current and projected demands, for both the Davie facilities and other facilities serving the Town. Population projections for the Davie Sewer and Water Service Areas were developed from the Broward County Land Use Map.

The water and wastewater facilities are currently operating at a L.O.S. of 206 and 116 gpcd respectively. These levels of service represent the total design capacities of the systems applied to the persons being served by the respective facilities. The levels of service are adequate to meet existing demand. All facilities meet required standards set forth by the applicable regulatory agencies as discussed earlier.

Water treatment facilities are currently operating at 45 percent of capacity; a 55 percent surplus capacity exists. Wastewater treatment facilities are currently operating at 86 percent of capacity; a 14 percent surplus in capacity exists based on population estimates. Actual plant flows are approximately 2.1 mgd which provides for actual 30% surplus capacity.

General Condition of the Facilities

The existing condition of the facilities is adequate for the service area. The existing wastewater treatment plant is currently undergoing refurbishment in conjunction with the 2 mgd expansion. The facilities are generally in good condition.

Impacts of Facilities on Natural Resources

The projected demand on water supply is not expected to adversely impact domestic irrigation or potable water quality. Computer modeling by Broward County Water Management Division detected no adverse impacts associated with well draw-down. The wells at System III were also test pumped and no adverse impacts were detected (Berry and Calvin Civil Engineers, impacts on lake levels; no adverse impacts are anticipated in the future (Berry and Calvin Civil Engineers, "Engineers Summary Report"; 1992).

The Broward County Study on salt water intrusion indicates the westward movement of the isochlor line to be U.S. 441 during the 100 year drought. The Town's wellfield will have no impact on this as the wellfield is located approximately two miles west of U.S. 441 (Berry and Calvin Civil Engineers, "Engineers Summary Report"; 1992). Sink holes are not prevalent in South Florida due to the geology and high groundwater table.

Analysis of Problems and Opportunities

There are no apparent problems with the sanitary sewer or potable water facilities that have not been addressed by the Town's expansion program. The System I Water Treatment Plant shall continue to operate at its current design capacity of 3.8 mgd. The System III Water Treatment Plant, which replaced the System II Plant in December 1988, is operating with a design capacity of 4.0 mgd. The systems currently maintain a total design capacity of 7.8 mgd until planned expansions occur in 2001 which shall increase capacity by another 4.0 mgd, for a total capacity of 11.8 mgd. This expansion would be warranted by an increase in service area or annexation beyond the current flow and population projections. See Figures III-8 and III-9.

The System II Wastewater Treatment Plant is currently at a design capacity of 3.0 mgd, with planned expansions of 2.0 mgd each to be completed by the years 1997-1998 and 2001, in accordance with the concurrency management system. Therefore, the projected design capacity for the year 2001 shall total 7.0 mgd.

Ferncrest Utilities Services Area

Ferncrest Utilities is a private utility company which has operational responsibility for the Water and Wastewater Treatment facilities located at 3015 Southwest 54 Avenue. The predominant land uses served by the facilities is industrial and residential (mobile home parks). The following information was provided by Ferncrest Utilities representatives.

Design Capacity of the Facility

Water Treatment Plant	1.0 mgd
Wastewater Treatment Plant	.60 mgd

Current Demand on the Facility Capacity

Water Treatment Plant	.35 mgd	
-Davie proportional share		<10%
Wastewater Treatment Plant	.20 mgd	
-Davie proportional share		<10%

Existing Level of Service and Capacity Surplus

Due to the fact that Ferncrest is primarily an industrial supplier, the LOS for the Ferncrest facilities is not measured in gpcd. All analysis for this Utility System is based on percentage of capacity surplus. The water treatment facility is operating at an acceptable LOS based on the approximate 65% capacity surplus; a current operating capacity of 35%. The wastewater treatment plant is currently operating at an acceptable LOS of approximately 67% capacity surplus: a current operating capacity of 33%.

General Condition of the Facilities

The current condition of the facility is adequate for the service area based on the capacity surplus percentage of 65% and 67% for the water and wastewater facilities respectively. The facilities were built in 1969 and expanded in 1979. In general, the facilities are in fair condition and the life expectancy is twenty years.

Impact of Facilities on Natural Resources

It is anticipated that the water used from the facility's wells will not have an adverse affect on potable water quality or irrigation systems, nor encourage salt water intrusion. Based on the geological strata, the formation of sink holes is highly unlikely in the South Florida area. The well pumping activities should not have an adverse affect on lake or borrow pit water levels in the vicinity.

Analysis of Problems and Opportunities

There are no identified problems with the provision of water or sanitary sewer facilities within this service area. Due to the fact that the majority of the area served by Ferncrest Utilities is developed, and there is currently an adequate level of service to the area, there are no plans for expansion or new facility siting. The only significant addition to the Town of Davie serviced by the utility is the 500 unit Palm Trace apartment complex, and the utility has sufficient capacity to service these units.

South Broward Utility Company Service Area

The South Broward Utility Company (SBU) is a private utility company which has operational responsibility for the facilities located at 15450 Stirling Road, Davie, Florida. Currently the predominant land use served by the facilities is residential; commercial development at the southeast corner of I-75 and Griffin Road is also served by SBU.

Design Capacity

Water treatment facility	2.0 mgd
Wastewater treatment facility	1.0 mgd

Current Demand on the Facility Capacity

Water treatment facility	0.6 mgd
-Davie proportional share	98%
Wastewater treatment facility	0.5 mgd
-Davie proportional share	98%

Existing Levels of Service

Based on plant capacities serving the service area population, the LOS for Water is 286 gpcd and for Sewer Facilities it is 140 gpcd.

Existing Capacity Surplus

The Water Treatment Plant is currently operating at 30% of capacity; there is a 70% capacity surplus. The Waste Water Treatment Plant is currently operating at 50% of capacity; there is a 50% capacity surplus.

The General Condition of the Facility

The current condition of the facility is adequate for the service area based on the capacity surplus of 70% and 50%. Construction of the facilities began in 1984. The general condition of the facilities is excellent and the expected life of the facilities is fifty years.

The Impact of Facilities on Natural Resources

It is anticipated that the water drawn from the wells will not have an adverse effect on potable water or irrigation systems, as well as lake levels. Additionally, it is anticipated that the water drawdown of the wells will not encourage salt water intrusion. Sink holes are not prevalent in the South Florida area due to geological formations.

Analysis of Problems and Opportunities

The Water Treatment Plant for the service area was constructed in two phases. Phase I was completed in 1986 and Phase II completed in 1989. The development within the existing service area is approximately 56% complete at the time this report was completed. Phases I and II of the water treatment plant will have a total capacity of 2.0 mgd and are designed to meet the future demands of the service area, pursuant to the South Florida Water Management District (S.F.W.M.D.) permit application. There are no identified problems with the provision of sanitary sewer or potable water services within this service area.

Sunrise Service Area

The City of Sunrise has operational responsibility for the following facilities which service Davie:

System I: Water Treatment Plant

System II: James Baxter Water and Wastewater Treatment facilities

System III: Wastewater Treatment Plant

The predominant land use served by each facility is residential. The information below was supplied by the City of Sunrise Engineering Department and Montgomery Watson engineers. It reflects the facilities listed above.

Design Capacity

Water treatment facilities	33.5 mgd
Wastewater treatment facilities	25.0 mgd

Current Demand on the Facility Capacity

Water treatment facilities	18.0 mgd
Wastewater treatment facilities	8.0 mgd

The Sunrise water treatment facilities, which serve a portion of Davie, currently operate at adequate levels of service based on the operational surplus of 46% for water facilities and 68% for wastewater facilities.

General Condition of the Facilities

The current level of service provided by the facility is adequate for the service area. The Sunrise Systems I & II Water Treatment Plants are in good condition. The Sunrise System II Wastewater Treatment Plant is in satisfactory condition, while the Sunrise System III Wastewater Treatment Plant is in good condition.

The Impact of Facilities on Natural Resources

The impact of the Sunrise System II Water Treatment Plant on natural resources is minimal. Lime sludge is contained on site and backwash water is recycled. The impact of Sunrise Systems II and III Wastewater Treatment Plants on natural resources is minimal.

Analysis of Problems and Opportunities

Systems I, II and III experience significant amounts of infiltration. A new water treatment facility with a 12 mgd capacity was completed in 1991 at Sunrise System I Water Treatment Plant, which is interconnected with System II Water Treatment Plant. This will result in total plant capacities of 33 mgd for Systems I & II. At Sunrise System III Wastewater Plant, a new facility with a 5 mgd capacity is completed and waiting for final operations permits. This resulted in a total plant capacity of 25 mgd. The City of Sunrise Water and Wastewater Systems I & III are integrated, thereby providing service to all areas within the identified Service Area.

Other Systems

City of Hollywood/Town of Davie

Both the City of Hollywood and the Town of Davie provide water services to a small portion of each other's jurisdiction. These service areas evolved over a period of time after which annexations determined municipal boundaries. Insofar as jurisdictional boundaries are now finalized in this area, the existing service systems are not expandable. The Davie proportional demand of the Hollywood water facility accounts for much less than 1/2% of total capacity. As such, a detailed analysis of this facility is not presented in this Element.

TABLE III-1
Town of Davie
System II Water and Wastewater Treatment Plant
Chronology and Estimated Costs

1) 1982 - System II water and wastewater plants acquired from Modern Pollution Control	
2) 1988(complete) - Effluent holding basin and pumping system including transmission main	
3) 1988(complete) - Water treatment plant addition	\$5,000,000
4) 1988(complete) - Two MGD wastewater treatment plant expansion (Phase 2)	\$4,500,000
5) 1991(complete) - Refurbish original System II one MGD wastewater treatment unit	\$2,800,000
6) 1995(start construction) - Two MGD wastewater treatment plant expansion (Phase 3)	\$335,000
7) 1995(start construction) - Water treatment plant well deepening	\$4,700,000
8) 1997(start construction) - Water storage tank refurbishment	\$145,000
9) 2001(start design) - Two MGD wastewater treatment plant expansion (Phase 4)	\$100,000
	\$2,100,000

SOLID WASTE

Existing Conditions

The largest portion of the solid waste stream is municipal solid waste which is made up of household discards. Next in volume is trash which consists of bulk items, such as construction debris. Landscaping debris, which is a year round component in South Florida, is the third largest type of solid waste. Last in volume is hazardous waste, which includes toxic and pathological substances, requiring separate handling. Solid waste generation in Broward County and Davie is equal to approximately 7.2 lbs. per capita per day, based upon annual gross tonnage of residential and non-residential refuse disposed in the landfill. The Broward County Solid Waste Section of the Utilities Division estimates that residences, on the average, are producing approximately 3 lbs. per capita per day.

Solid waste disposal in Broward County is a regional function. The current disposal technique utilized in Broward County is resource recovery (incineration and ash landfill). There are resource recovery facilities that service Broward County including all of the Town of Davie. These facilities are currently processing about 1.0 million tons of solid waste per year. Of this figure, approximately 3.4% is generated from the Town of Davie.

The Town of Davie has entered into an Interlocal Agreement for a Resource Recovery System. The system went on line in 1991 with a capacity to handle 1.34 million tons of solid waste per year in the Broward County geographic area. This system will supplement the 1.4 million ton per year capacity of the existing landfills and will extend the life expectancy of the landfills (2) (estimated to be 20 years). According to the County, a Level of Service Standard to process the estimated 7.2 lbs. per capita per day of solid waste generation will be met through the planning time-frame.

During the period from 1994 to 2000, the need to landfill some garbage may continue until the county expands resource recovery facilities capacity by constructing an additional cell(s) at either of the facilities. A third option, to develop the Western Resource Recovery Facility at the reserved location, is also available (as of June 1995, no expansions were planned)(3).

Analysis of Existing Soil Conditions

Soil Types and Characteristics

Soil is the upper layer of the earth surface. Climate, plants, and animals are the active forces shaping soil formation. They act on the parent material that has accumulated on the weathering of rocks and slowly change it into soil.

Utilizing soil survey information, planners can evaluate their effect on and sensitivity to different land uses and consequently the environmental impact. Such information can help maintain a land use pattern in harmony with natural soil. The same information is helpful to plan for the safe disposal of wastes, and location

of mineral sources.

According to the United States Department of Agriculture and the Soil Conservation Service Soil Survey of Broward County, Florida, Eastern Part the predominant soils within the Town of Davie are Dania Muck, Hallandale Muck, Lauderdale Muck, Margate Muck, Okeelanta Muck, Plantation Muck, Pomello Muck, Pompano Muck, and Sanibel Muck. The Recreation, Open Space and Conservation Element contains a generalized soils map for the Town of Davie (see Figure III-5).

Drainage

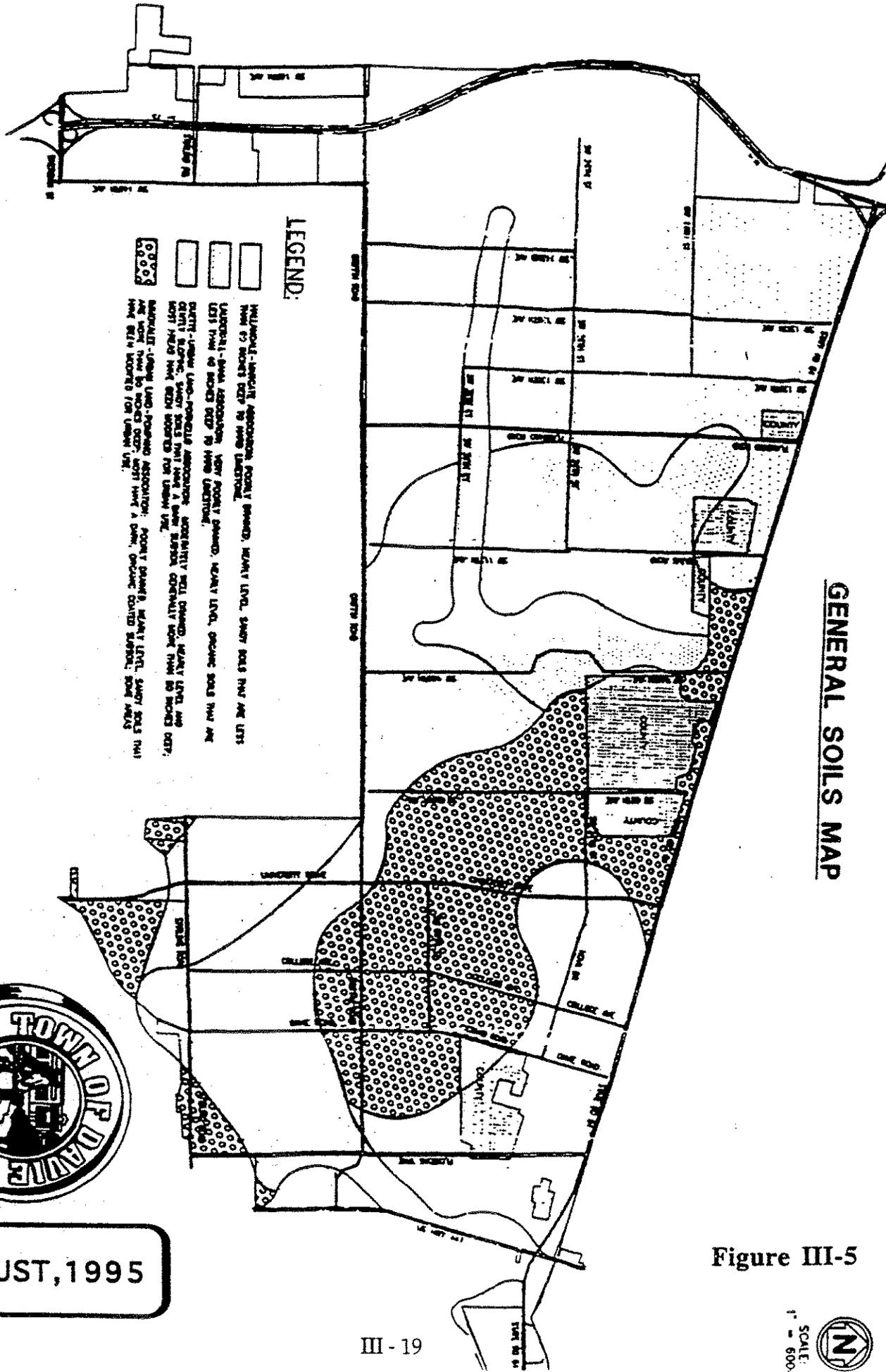
Soil properties create limitations on urban uses and development such as poor percolation and instability. These characteristics necessitate the modification, excavation and backfill of building site to ensure adequate drainage and water management needs.

Septic Tanks

The use of septic tanks within the Town of Davie is limited to areas not yet served by sanitary sewer systems. Due to the presence of soils in the Town of Davie that are unsuitable for septic tanks, the Broward County Health Department requires that all such soils be removed from the septic tank site and replaced with sand prior to issuance of a septic tank permit. Therefore, the use of septic tanks within the Town of Davie is not permitted where unsuitable soil has not been removed and replaced with sand.

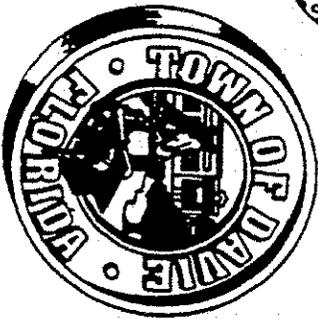
- (1) Except for Dania, Hallandale, Pembroke Pines, Pompano Beach and Parkland.
- (2) Central disposal sanitary landfill (Pompano Beach) and Broward County Interim Contingency Landfill.
- (3) Broward County Office of Integrated Waste Management.

GENERAL SOILS MAP



LEGEND:

-  NATIONAL-UNIQUE ASSOCIATION, POORLY DRAINED, HEAVY LIND, SANDY SOILS THAT ARE LITTLE MORE TO SOILS COPY TO HAVE UNUSUAL.
-  NATIONAL-UNIQUE ASSOCIATION, VERY POORLY DRAINED, HEAVY LIND, CLAYE SOILS THAT ARE LITTLE MORE TO SOILS COPY TO HAVE UNUSUAL.
-  NATIONAL-UNIQUE ASSOCIATION, MODERATELY WELL DRAINED, HEAVY LIND, AND HEAVY CLAYE, SANDY SOILS THAT HAVE A SAND SUBSTR. GENERALLY MORE THAN 50 SOILS COPY.
-  NATIONAL-UNIQUE ASSOCIATION, POORLY DRAINED, HEAVY LIND, SANDY SOILS THAT ARE MORE THAN 50 SOILS COPY, MOST HAVE A SAND, CLAYE SAND SUBSTR. SOME ARE/AS THAT ARE MORE FOR UNUSUAL.



AUGUST, 1995

Figure III-5

Major Natural Drainage Features and Ground Water Aquifer Recharge Areas

Drainage Features

The primary drainage features within the Town of Davie are the North New River Canal and the South New River Canal (C-11 Canal) and their tributary canals, man-made facilities constructed originally to drain the Everglades, and used to accommodate the flow of water. According to the South Florida Water Management District, all of Broward County is considered a natural groundwater aquifer recharge area for the Biscayne Aquifer, our sole source of water supply. However, no prime recharge areas have been designated by the South Florida Water Management District within Broward County.

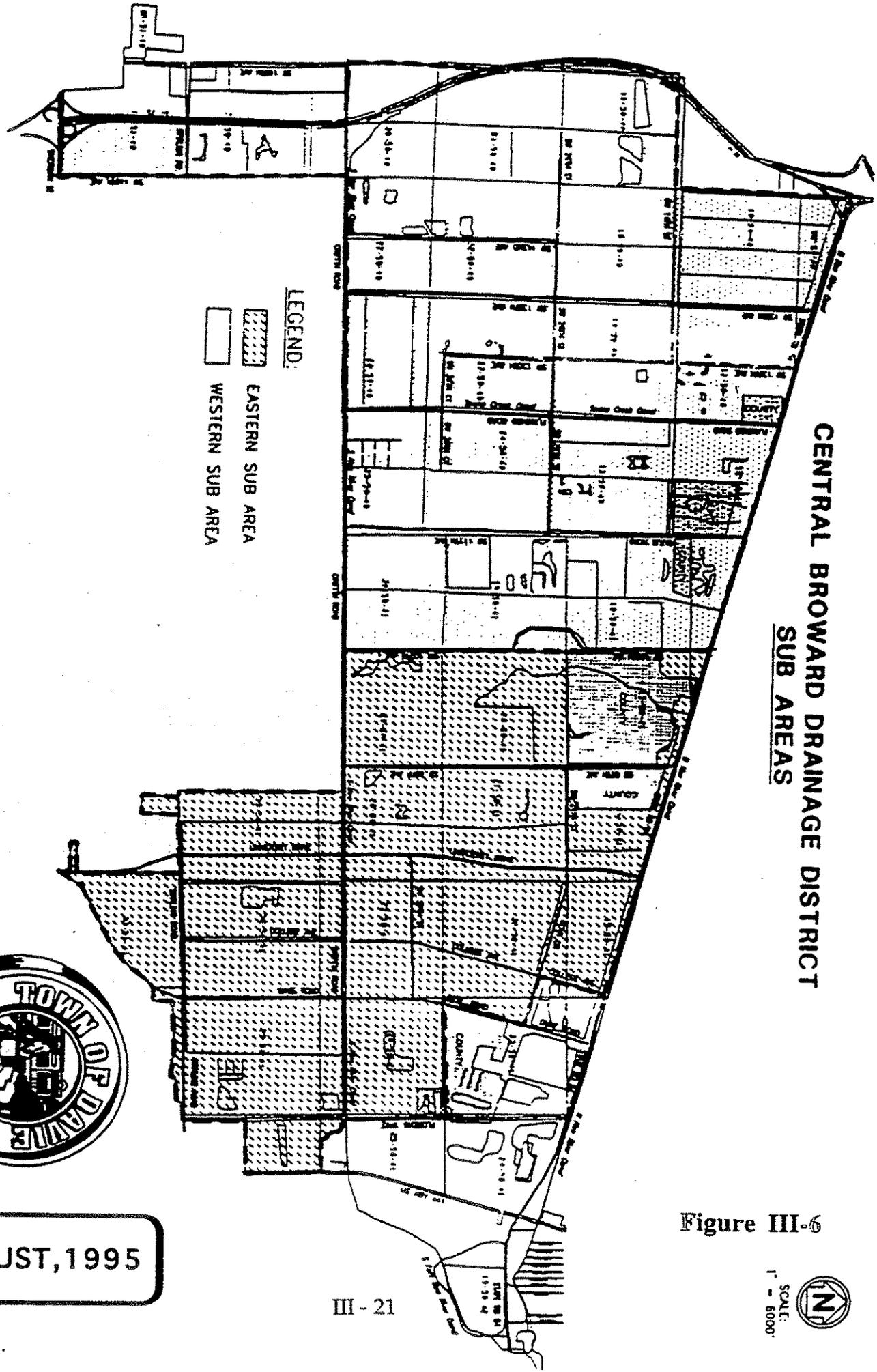
The Town of Davie is divided essentially into two basins at SW 100 Avenue (see Figure III-6). The west basin is controlled by a South Florida Water Management District pump station (S-9) located at approximately US-27 and Griffin Road. The Eastern basin is controlled by a pump station (S-13) on the C-11 canal. The 100th Avenue divide is an equalizer known as S-13A. This structure can be opened to control local storms or equalize water levels in the east and west basins.

Development of Man-Made Drainage Features

The Town of Davie Development Review Committee, Central Broward Drainage District, South Florida Water Management District, and the Broward County Water Management Division govern land use and development of drainage features and groundwater recharge areas. The Central Broward Drainage District and the South Broward Drainage District, Broward County, Indian Trace Community Development District and Tindall Hammock Soil and Conservation District maintain jurisdiction with regard to stormwater management. The districts are special taxing districts with authority to regulate and maintain drainage within an area that encompasses the Town and the surrounding canal network.

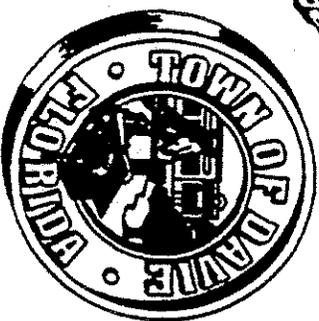
The Florida Department of Environmental Protection has adopted a Stormwater Rule (Ch. 62-25, F.A.C.) to fulfill part of the state's responsibilities under Section 208 of the Federal Water Pollution Control Act. The rule's basic objective is to achieve 80-95 percent removal of stormwater pollutants before discharge to receiving waters. This rule requires treatment of the runoff from the first one inch of rainfall; or for facilities with a drainage area less than 100 acres, the first one-half inch of runoff. Implementation of the stormwater rule is achieved through a permitting process. The F.D.E.P. has delegated permitting responsibility to the South Florida Water Management District which has jurisdiction over the Town of Davie Area. The Town of Davie requires the involvement of drainage districts, including the Central Broward Drainage District, Tindall Hammock Soil and Water Conservation District, and South Broward Drainage District, in the development review process. For a map of these Drainage District Service Areas, see FIGURE III-2. The function of the districts in the insert basins map review process is to evaluate proposed improvements to land, to insure the provision and maintenance of adequate drainage facilities to satisfy the current and future needs of the area. The

CENTRAL BROWARD DRAINAGE DISTRICT SUB AREAS



LEGEND:

- EASTERN SUB AREA
- WESTERN SUB AREA



AUGUST, 1995

Figure III-6

SCALE:
1" = 6000'

appropriate drainage district reviews all plats and paving plans prior to the Town's review and/or issuance, for compliance with paving and drainage regulations.

Minimum standards for road crowns and finished floors are dictated by Broward County Water Resources Management Division. These standards are adopted by the drainage districts and the Town of Davie. These standards generally range from 5' to 7.5' above mean seal level for road crown elevations and from 7' to 8' above mean sea level for floor elevations, and are in compliance with Federal Emergency Management Agency (F.E.M.A.) regulations.

In general, the regulations of the drainage districts provide sufficient flood protection for the Town of Davie. Central Broward Drainage District personnel serve on the Development Review Committee, affording the Town a good opportunity for coordination regarding drainage issues.

Design Capacity for Storm Return Frequency. The existing canal network of the Central Broward Drainage District is fashioned on a minimum grid of 1/2 mile, unobstructed, connections into the South Florida Water Management's C-11 canal. The Drainage Districts provide a primary level of service for open flow protection into C-11 by gravity. This service is regulated by South Florida Water Management District's area design of maximum allowable discharges of 3/4" per acre per day for properties west of 100th Avenue and 1 1/2" per acre per day for properties east of 100th Avenue. (See Figure III-2A, Canal Network).

General Condition of Drainage Features. In general, the Town's drainage system operates smoothly and provides adequate protection from flooding. The system requires constant maintenance of debris and silt management and aquatic weed control. The Drainage Districts are currently performing these tasks. Water quality within the system of canals is generally good, but regulation is by Broward County. The Town and the Drainage Districts have adopted the dictates of the county standards and maintain compliance with same. On-site retention improvements necessary to accommodate development are identified and required in conjunction with plat, site plan and/or building permit review.

Development of Major Natural Drainage Features

There are no major natural drainage features located within the Town of Davie. Several minor features, such as small wetland sites, a disturbed oak hammock and a disturbed slough site, exist and are being evaluated for their productivity and contribution to the natural ecosystem (please refer to the Recreation, Open Space and Conservation Element). Development of these natural areas is severely restricted by existing land development regulations.

Natural Groundwater Aquifer Recharge Area

Water quality standards for both surface waters and groundwaters are established and enforced by the DNRP as part of its responsibilities for water pollution control and abatement. It maintains a surface water and ground water quality monitoring network throughout the County and regulates wastewater discharge. For a description of parameters and monitoring results of the DNRP C-11 monitoring station, see the Recreation, Open Space Conservation Element. The DNRP has also promulgated storage tank and hazardous materials regulations intended to prevent contamination of the aquifer. A license is required from the DNRP for any dredging and filling within the "waters of Broward County" as defined in Chapter 27-11 of the DNRP Code of Regulations.

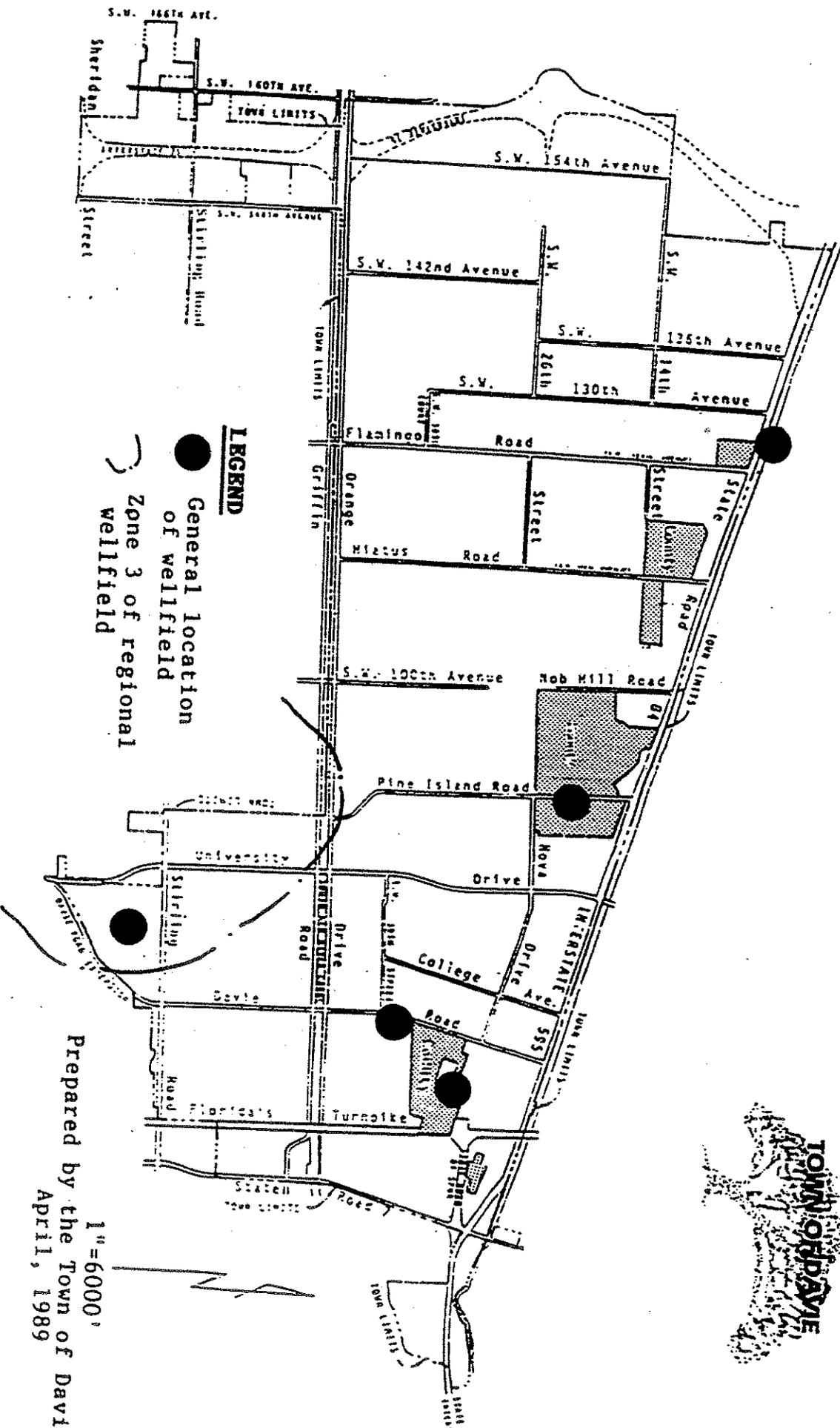
Regulations. Additional protection for groundwater recharge and wellfields has been provided through the Countywide application of the Wellfield Protection Program. Through County ordinances, all potable water wells and accepted proposed potable water well sites are protected from activities that utilize or create, as a by-product, hazardous or toxic materials. The Wellfield Protection Ordinance provides for three "zones of influence" surrounding each well, which correspond to the travel time within the aquifer. The use, handling and storage of listed toxic materials has been excluded from the innermost zone with monitoring and other protective measures applied in the middle and outer zones. Prior to inclusion in the program, wells and proposed well sites must be modeled, mapped and approved by the County Commission. Wellfields within the Town of Davie are located on Figure III-7 on the following page.

Existing Conditions. Broward County is underlain by two major aquifers; the Biscayne aquifer and the Floridian aquifer. The Biscayne aquifer is the only reliable source of potable water in the County. It is one of the most productive unconfined aquifers in the United States and one of the most permeable aquifers in the world. It underlies all of Broward County except the most westerly sections.

The S.F.W.M.D. has not designated any area within Broward County as a "prime groundwater recharge area". A major source of recharge to the Biscayne aquifer in Broward County the Everglades Water Conservation Areas. The three Water Conservation Areas (2a, 2b, and 3a) total 790 square miles and comprise approximately two-thirds of the County's total land area. Recharge occurs naturally as stormwater, which is stored and purified in the Conservation Areas, seeps into the aquifer.

Other major sources of recharge include the system of canals in the developable areas of the County. The land surface itself is also a major source of aquifer recharge. Generally, soil conditions in the County are conducive to recharge of the Aquifer. With the exception of those areas in southwest Broward with thick muck soils, movement of water into the ground is rapid. Recharge also may be obtained through injection and spray irrigation.

GENERAL LOCATION OF WELLFIELD PROTECTION AREAS



Prepared by the Town of Davie
 April, 1989

FIGURE III-7

Utilities Element: Needs Analysis

Water and Wastewater Service

The following section provides an analysis of the availability of the water and wastewater treatment facilities to meet projected demand on capacity. The analysis evaluates the availability of services based on the improvements and expansion of the facilities referenced in the Inventory of Existing Conditions. The analysis contained herein is based on an initial planning period of five years to the year 2000, and a long range time frame of ten years to the year 2005.

DAVIE SERVICE AREA:

• Initial Planning Period-1995-2000

2000 Design Capacity of the Facilities

Water treatment facilities	11.8 mgd
Wastewater treatment facilities	5.0 mgd

2000 Projected Demand on the Facility Capacity (Davie Proportional Demand 100%)

Water treatment facilities	4.2 mgd
Water treatment capacity surplus	64%
Wastewater treatment facilities	2.87 mgd
Wastewater treatment capacity surplus	43%

• Long Range Planning Period 1995-2005

2005 Design Capacity of the Facilities

Water treatment facilities	11.8 mgd
Wastewater treatment facilities	7.0 mgd

2005 Projected Demand on the Facility Capacity (Davie proportional capacity 100%)

Water treatment facilities	4.6 mgd
Water treatment capacity surplus	61%
Wastewater treatment facilities	3.14 mgd
Wastewater treatment capacity surplus	55%

Facility Capacity Analysis and Projected Levels of Service

In order to project Levels of Service throughout the short and long range timeframes, basic water demand and wastewater flow projections were derived from the population projections for the water and wastewater service areas. As mentioned earlier, the population projections for these areas were developed from the Broward County Land Use Plan Map. The estimated population projections

were determined based upon the maximum densities permitted under each particular land use designation. The projections for water demand were based on the maximum dwelling units per acre, number of persons (capita) per dwelling unit and a per capita consumption of 100 gallons per day. The projections for wastewater flows were based upon 110 gallons per capita per day. These figures for demand and flows are based on studies of flows in the South Florida area. Future plant expansion needs can be determined by comparing existing design capacities with projected demand and flows. The Town of Davie has planned its capital improvement needs around these projections. As shown in Table III-1, Davie is planning to expand the Water Treatment Plant by 4 million gallons per day in 2001, which will increase the total design capacity to 11.8 million gallons per day. Programmed Wastewater Treatment Plant expansions include an additional 2 million gallons per day currently being added and again in 2001 for a total design capacity of 7 million gallons per day.

Table III-2 and Figures III - 8-11 illustrates the existing and projected Levels of Service for the Water and Wastewater systems through the initial and long range planning periods. The Levels of Service, reflected in gallons per capita per day (gpcd), are projected by dividing total plant capacities by the number of persons being served by the respective plants. As is shown in the tables and graphs, the projected Levels of Service will fluctuate based upon the future planned expansions and the population growth in the service areas. The Town will maintain or exceed a Level of Service of 116 gpcd for wastewater service until the planned 2 mgd plant expansion in 1998, at which time a Level of Service of 190 gpcd will be provided. In 2001, when the second 2 mgd plant expansion is completed, the Level of Service will rise to 234 gpcd.

Table III-3 reflects the fact that water Levels of Service during the 10 year planning time frame will fluctuate between 197 and 292 gpcd, again, the fluctuation being determined by the proposed 4 mgd plant expansion in 2001 and the population growth rate in the service area.

**TABLE III-2. PROJECTED CAPACITY SURPLUS FOR
WASTEWATER AND WATER FACILITIES**

	<u>WASTEWATER</u>			<u>WATER</u>		
	<u>CAPACITY</u> <u>(mgd)</u>	<u>DEMAND</u> <u>(mgd)</u>	<u>% OF</u> <u>CAPACITY</u>	<u>CAPACITY</u> <u>(mgd)</u>	<u>DEMAND</u> <u>(mgd)</u>	<u>% OF</u> <u>CAPACITY</u>
1995	3.00	2.58	86	7.8	3.79	49
1996	3.00	2.64	88	7.8	3.87	50
1997	3.00	2.70	90	7.8	3.96	51
1998	5.00	2.75	55	7.80	4.04	52
1999	5.00	2.81	56	7.80	4.13	53
2000	5.00	2.87	57	7.80	4.21	54
2001	5.00	2.92	58	11.80	4.29	36
2002	7.00	2.98	43	11.80	4.37	37
2003	7.00	3.03	43	11.80	4.45	38
2004	7.00	3.09	44	11.80	4.53	38
2005	7.00	3.14	45	11.80	4.61	39

Notes: 1. Wastewater demand projections based upon 110 gpcd.
2. Water demand projections based upon 100 gpcd.

Source: Town of Davie Department of Development Services provided the population figures.

**TABLE III-3. SERVICE AREA
POPULATION PROJECTIONS AND
LEVEL OF SERVICE (gpcd)**

	<u>WASTEWATER</u>		<u>WATER</u>	
	<u>Population</u>	<u>LOS</u>	<u>Population</u>	<u>LOS</u>
1995	25,808	116	37,887	206
1996	26,383	114	38,731	201
1997	26,958	111	39,575	197
1998	27,532	182	40,419	193
1999	28,107	178	41,262	189
2000	28,682	174	42,106	280
2001	29,232	171	42,913	275
2002	29,782	235	43,721	270
2003	30,332	231	44,528	265
2004	30,882	227	45,336	260
2005	31,432	223	46,143	256

Source: Town of Davie Department of Development Services provided the population figures.

The Town of Davie has programmed its water and wastewater plant expansions in advance of need to meet the projected demand and flows of the system through the 5 and 10 year planning periods. As for the wastewater facility, the programmed expansions for 1997-1998 and 2001 are planned to maintain, at a minimum, a LOS of 171 gpcd.

The programmed 4 mgd water facility expansion in 2001 was also planned well in advance of actual need. This facility expansion will assure a LOS of at least 185 gpcd is maintained throughout the planning periods. This will also assure a minimum of 42% facility surplus for wastewater and a 46% capacity surplus for water through the planning periods.

Adequacy of Service is based upon the demonstration that an existing water or wastewater treatment facility has sufficient capacity to provide for the needs of the new development and other developments in the service area. These Levels of Service, which represent total plant capacities divided by the number of persons served by the plants, are adequate to serve the needs of the service areas throughout the initial and long range planning periods.

FIGURE III - 8
Projected Water Facility Capacity

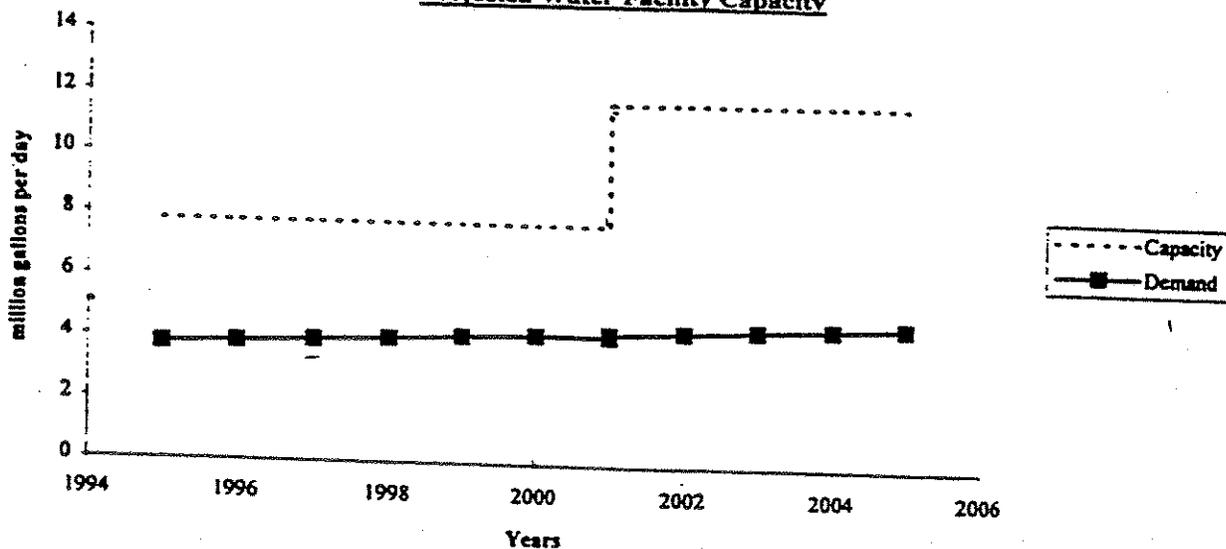


FIGURE III - 9
Projected Wastewater Facility Capacity

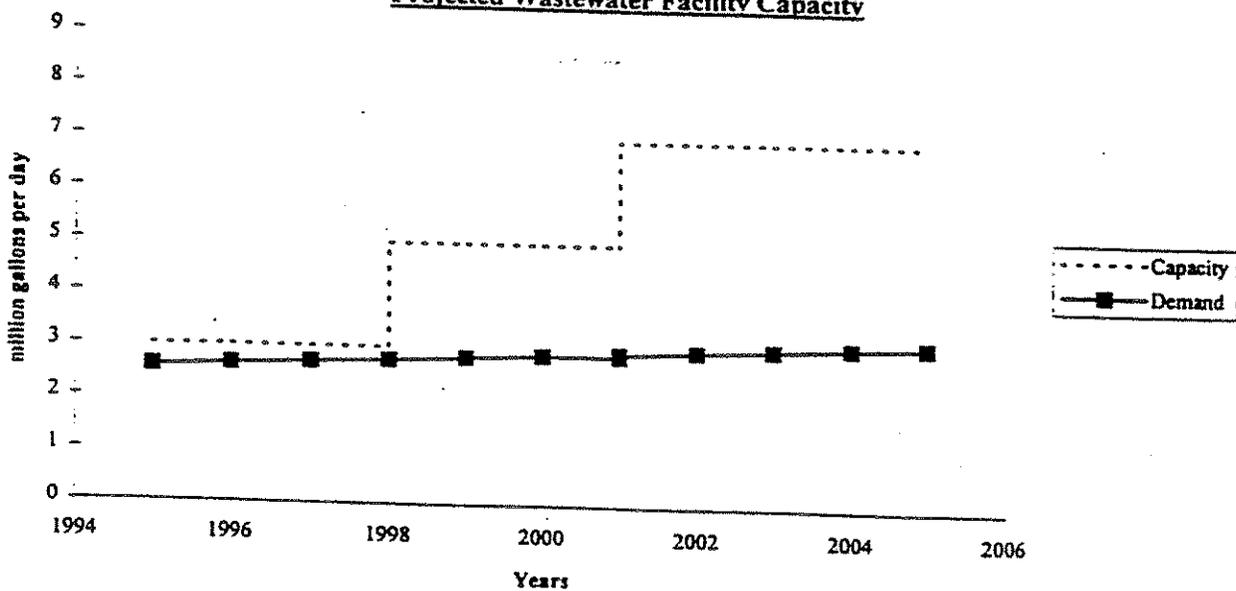


FIGURE III - 10
Projected Water Level of Service

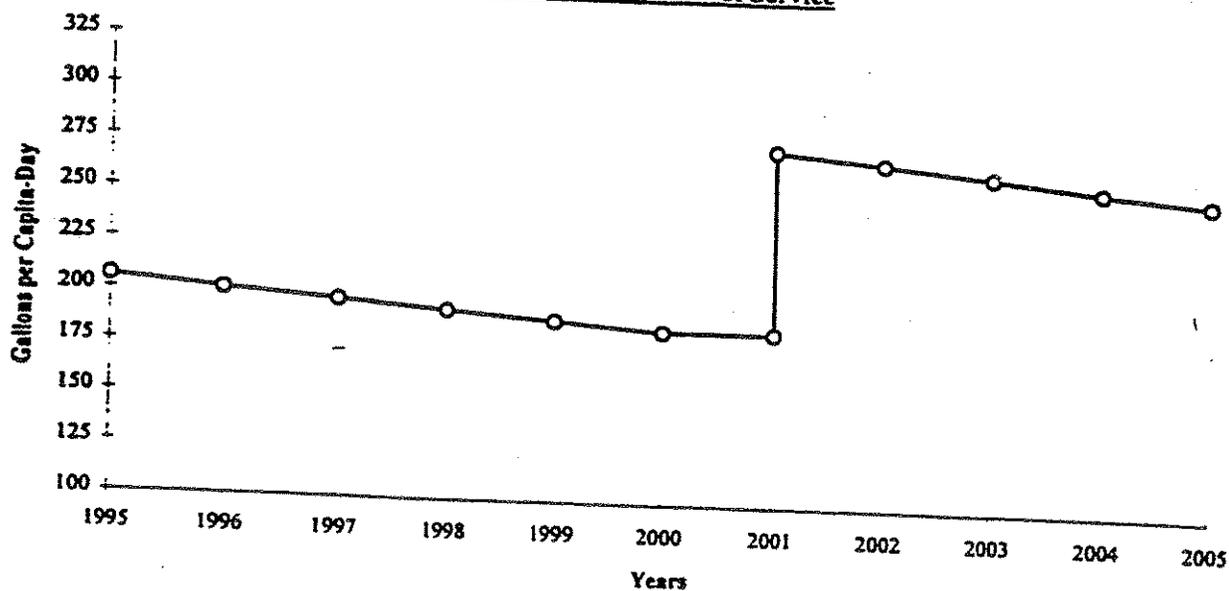
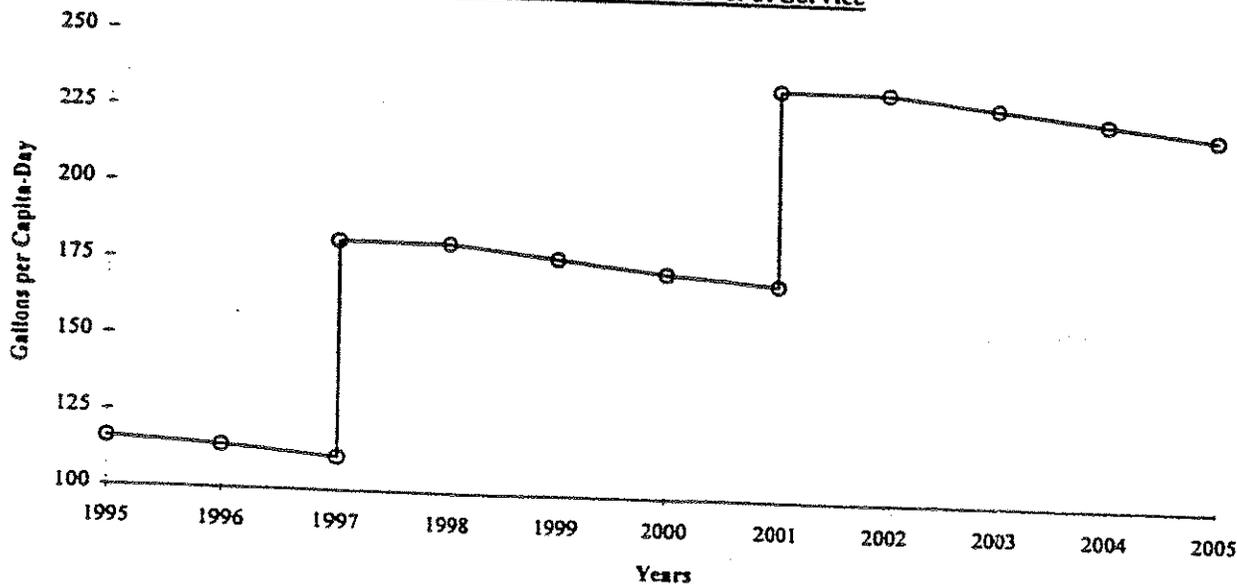


FIGURE III - 11
Projected Wastewater Level of Service



FERNCREST UTILITIES SERVICE AREA:

• **Initial & Long Range Planning Periods 1995-2005**

The Ferncrest Utilities Company has no plans for expansion, nor is there an need for expansion to accommodate demand throughout the short- and long-term planning timeframes. Therefore, no distinction is made between the initial and long range planning periods.

• **Design Capacity of the Facilities**

Water treatment facilities	1.00 mgd
Wastewater treatment facilities	.60 mgd

• **Projected Demand on the Facility Capacity**

Water treatment facilities	0.55 mgd
-Davie projected share	23%
Wastewater treatment facilities	0.37 mgd
-Davie projected share	31%

• **Facility Capacity Analysis**

For the initial and long range planning periods, 1995-2005, the water treatment facilities will be operating at 55% of capacity with a projected 45% surplus capacity. For the initial and long range planning periods, 1995-2005, the wastewater treatment facilities will be operating at 62% of capacity with a projected 38% capacity surplus.

• **Projected Levels of Service**

Since Ferncrest's LOS is not analyzed in gpdc, a judgment of future capacity adequacy is made based on available surplus capacity. Considering the projected average of 45% surplus capacity for water and 38% for wastewater for the Ferncrest System through the year 2000, the LOS appears to be adequate to serve the needs through the planning periods.

SOUTH BROWARD UTILITIES COMPANY SERVICE AREA:

Initial Planning Period 1995-2000

• **Design Capacity of the Facilities**

Water treatment facilities	2.00 mgd
Wastewater treatment facilities	1.00 mgd

• **Projected Demand on the Facility Capacity**

Water treatment facilities	0.657 mgd
-Davie projected share	98%
Wastewater treatment facilities	0.555 mgd
-Davie projected share	98%

• Facility Capacity Analysis

For the initial planning period, 1995-2000 the water treatment facilities will be operating at 34% of capacity with a projected 66% capacity surplus. For the initial planning period, 1995-2000, the wastewater treatment facilities will be operating at 56% of capacity with a projected 44% capacity surplus.

Long Range Planning Period 1995-2005

• Design Capacity of the Facilities

Water treatment facilities	2.00 mgd
Wastewater treatment facilities	1.00 mgd

• Projected Demand on the Facility Capacity

Water treatment facilities	.73 mgd
-Davie projected share	98%
Wastewater treatment facilities	.61 mgd
-Davie projected share	98%

• Facility Capacity Analysis

For the long range planning period, 1995-2005, the water treatment facilities will be operating at 37% of capacity with a projected 63% capacity surplus. For the long range planning period, 1995-2005, the wastewater treatment facilities will be operating at 39% of capacity with a projected 61% capacity surplus.

Projected Levels of Service

	<u>Wastewater</u>	<u>Water</u>
Year 2000	126 gpcd	252 gpcd
Year 2005	115 gpcd	230 gpcd

SUNRISE SERVICE AREA:

(Data from "City of Sunrise Water and Wastewater Master Plan" 1992)

Initial Planning Period 1995-2000

• Design Capacity of the Facilities

Water treatment facilities	33.40 mgd
Wastewater treatment facilities	25.00 mgd

• Projected Demand on the Facility Capacity

Water treatment facilities	22.15 mgd
Wastewater treatment facilities	19.30 mgd

- Facility Capacity Analysis

For the initial planning period, 1995-2000, the water treatment facilities will be operating at 66% of capacity with a projected 34% capacity surplus. For the initial planning period, 1995-2000, the wastewater treatment facilities will be operating at 77% of capacity with a projected 23% capacity surplus.

Long Range Planning Period 1995-2005

- Design Capacity of the Facilities

Water treatment facilities	36.30 mgd
Wastewater treatment facilities	25.00 mgd

- Projected Demand on the Facility Capacity

Water treatment facilities	24.27 mgd
Wastewater treatment facilities	21.20 mgd

- Facility Capacity Analysis

For the long range planning period, 1995-2005, the water treatment facilities will be operating at 67% of capacity with a projected 33% capacity surplus. For the long range planning period, 1995-2005, the wastewater treatment facilities will be operating at 85% of capacity with a projected 15% capacity surplus.

SOLID WASTE

Projected Need

Adequacy of solid waste disposal service is based upon the demonstration that an existing solid waste facility has sufficient capacity to provide for the needs of existing and new development. If service is not currently available but there is an economically and fiscally feasible plan to provide service, the development permit may be conditioned on that availability.

The following table provides solid waste generation projections for Broward County. Total waste includes all solid waste requiring disposal excluding ash. The garbage and trash figures were adjusted to reflect the one percent annual increase in the solid waste generation rate over and above that expected from the projected population increase. This adjustment was made to account for the difference between the approximate three percent increase in reported solid waste disposal since 1984 and the approximate two percent increase attributable directly to population.

The curbside collection of solid waste in the Town is handled by a franchised private

TABLE III - 4
Solid Waste Generation Projections (Thousand Tons)

Broward County
1995-2000

<u>Year</u>	<u>Est. Pop.</u>	<u>Garbage</u>	<u>Trash</u>	<u>Total Waste Lbs/Cap/Day</u>	
1995	1,470,300	1,366	580	1,946	7.2
1996	1,492,500	1,386	580	1,966	7.2
1997	1,514,600	1,406	580	1,986	7.2
1998	1,536,800	1,426	580	2,006	7.2
1999	1,558,900	1,446	580	2,026	7.1
2000	1,581,100	1,466	580	2,046	7.1

Source: Broward County Office of Integrated Waste Management

carting company and is planned to be handled in this manner in the future. The disposal of the collected trash is a County function as it would be impractical for each of the municipalities of Broward to site their own disposal facility and provide for individual collection. The Town has, through interlocal agreement, pledged its waste stream to Broward County.

The continued use of landfill disposal presents two primary problems: first, the problem of inadequate long-range capacity to continue the present level of service as County growth continues; and, second, the concern regarding possible groundwater contamination of the Biscayne Aquifer, the county's sole source of potable water. As an alternative to sanitary landfilling, the County opened two resource recovery plants in 1991, each of which has a capacity of 2,250 tons per day. These plants will produce electric power for sale to Florida Power and Light Co. and the ash residue will be greatly reduced in volume and practically inert. The combined capacity of these facilities will handle the projected solid waste until around 2000, at which time one of the plants will need to be expanded by 33% to 3,000 tons per day (as of June 1995, no expansions were planned).

When resource recovery plants are running at maximum output, increased capacity can be achieved by constructing additional modules at existing facilities or by developing new sites. When landfill capacity is depleted, additional capacity can be developed by broadening the base of existing cell areas, increasing the height of cells, or developing new cells. Broward County and private companies have proposed to construct additional facilities in order to provide an adequate level of service for solid waste disposal during the planning periods ending in 2000 and 2005. These facilities are as follows:

Facility

Year	Facility	Type
1997	CDSL(1)	Ash Cell 3- 1,257,000 CY
1998	CDSL	Sanitary Cell 2 - 3,180,000 CY(2)
2000	South Ash	Ash Cell 2 - 2,957,000 CY(2)
2000	MRF	Expansion or 2nd MRF

(1) Central Disposal Sanitary Landfill, owned and operated by a subsidiary of Waste Management, Inc. was expanded in 1988, 1991 and 1994 to handle Municipal Solid Waste as well as ash residue from the North Resource Recovery Facility. A separate ash residue landfill was developed at the South Resource Recovery Facility in 1988.

(2) The actual size of cells constructed will be determined at the time based on updated projections of need.

Broward County is contractually obligated to deliver 1,095,000 tons per year to the Wheelabrator Resource Recovery Facilities. Current demand is 1,000,000 tons per year and 30,000 tons per year at the Broward County Interim Contingency Landfill at US Highway 27 and Sheridan Street. The current tipping fee is \$50.00/ton. The processable waste is disposed at the Wheelabrator South Broward, Inc. Southern Resource Recovery Facility at 4400 South State Road Seven. The current tipping fee is \$7,587/ton. In September, 1993, a Materials Recovery Facility (MRF) was opened, which is owned and operated by Browning Ferris Industries, Inc., under contract to the County.

Another opportunity for the reduction of the solid waste stream is through source separation and collection of recyclable materials. These materials include newsprint, aluminum, glass, and certain types of plastic beverage containers. Recycling reduces the capital costs of expanding disposal facilities, as the volume of solid waste is reduced. Recycling also saves natural resources, reduces energy in production, and reduces air and water pollution associated with the mining and processing of raw materials. In response to growing concern for the environmental and economic affects of landfilling, the Florida Legislature, in 1988, approved Senate Bill 1152 which requires all counties to draft and establish a recycling program by July 1989. The legislation requires a phased reduction of solid waste resulting in a decrease in solid waste production by 30 percent as of 1993. The County's resource recovery program has addressed this new mandate.

Considering the current and projected solid waste generation rates for Davie and Broward County, and the existing and proposed capacities of the landfills and disposal facilities, the projected LOS for Davie and Broward County solid waste generation is adequate to support projected population and growth rates through the year 2000 and beyond.

Drainage

Projected Need

The South Florida Water Management is currently undertaking operations and study of the Western C-11 basin. This study, incomplete as of August 1, 1995, will evaluate and offer recommendations on the present and proposed operating procedures of the basin and pumping station.

Because of the mixing of positive and retained waters within the District's canals, it is difficult to assess the impact of a change in operation of the Western C-11 basin. If the study shows the pumping operation to be adequate, then the system as a whole will need only to maintain the status quo. If the study reveals a drastic change to minimize the pumping is necessary, then more retention lakes and more lateral canals will be required.

In general, the regulations of the drainage districts provide sufficient flood protection. Drainage District personnel serve on the site plan committee and the development review committee, this liaison provides a good basis for the needs and wants of the Drainage District and the Town.

The Town and the Drainage Districts must maintain the open water body concept in order to prevent flooding from a major storm event. Developers who border on the canal network should provide for relocation, not elimination, of the system.

**Sanitary Sewer, Solid Waste, Drainage, Potable
Water, and Natural Groundwater
Aquifer Recharge Element:
Goals, Objectives and Policies**

GOAL: Provide for the safe, efficient, and adequate supply of sanitary sewer treatment capacity, solid waste disposal, drainage facilities and potable water service for new and existing developments while maintaining and protecting the functions of natural ecosystems and allowing for development consistent with the Goals, Objectives and Policies of the Land Use Element of the Comprehensive Plan.

SANITARY SEWER SERVICE

OBJECTIVE 1: The Town shall provide adequate sanitary sewer service to the Davie service areas in a manner consistent with regulations promulgated by applicable regulatory agencies.

- **Policy 1-1:** The Level of Service (LOS) standard for sanitary sewer facilities is herein adopted to be 110 gallons per capita per day (gpcd), also described as 350 gallons per day (gpd) per equivalent residential connection (ERC) for potable water service. The ERC for non-residential, commercial, industrial or institutional connections shall be based on the Daily Flow Table on the following page:

ANTICIPATED AVERAGE DAILY FLOW TABLE
TYPES OF BUILDING USAGE

RESIDENTIAL

Average Daily Flow/Gallons per day

SINGLE FAMILY DETACHED

Three (3) bedrooms	350 GPD
Two (2) bedrooms or less	300 GPD
each additional bedroom	50 GPD

MULTI-FAMILY BLDGS, INCLD TOWNHOUSE BLOCKS

Three (3) bedrooms	325 GPD
Two (2) bedrooms	275 GPD
One (1) bedroom	250 GPD
Efficiencies	200 GPD

DUPLEXES, TRIPLEXES OR QUADRAPLEXES

Same as multi-family above

MOBILE HOME PARKS

Single Coach Units (One bathroom)	200 GPD
Double Coach Units (Two bathrooms)	300 GPD

TRAVEL TRAILER PARKS

Per space	150 GPD
-----------	---------

OTHER THAN RESIDENTIAL

Average Daily Flow/Gallons per Day

AIRPORTS

Per Passenger	2 GPD
Per Employee	14 GPD

ASSEMBLY HALLS (per seat)

2 GPD

BAR & LOUNGES W/NO FOOD SERVICE

(per seat)

20 GPD

BEAUTY PARLORS

Per 100 sq. ft. of work area

30 GPD

BOWLING ALLEYS

Per lane (including Bar & Food Service)

200 GPD

CAMPS

Day, No Food Service (Per Person)

25 GPD

luxury resorts (Per Person)

100 GPD

labor (Per Person)

100 GPD

Youth & Recreation (Per Person)	15 GPD
CHURCHES (Per Sanctuary Seat)	5 GPD
DANCE HALLS (Per Person)	3 GPD
DENTIST OFFICE (Per chair)	250 GPD
FACTORIES	
With Showers (Per person/shift or 100 s.f./shift)	30 GPD
W/O Showers (Per person/shift or 100 s.f./shift)	15 GPD
FUNERAL HOMES (Per 100 s.f.)	10 GPD
HOSPITALS AND NURSING HOMES	
Per Bed Space	200 GPD
Each Resident Staff	100 GPD
HOTELS & MOTELS (per room or unit)	150 GPD
INSTITUTIONS (Public, other than those listed herein)	
Per person including resident staff	100 GPD
LAUNDRIES (coin operated)	
Per machine	275 GPD
OFFICE BUILDING (except medical & dental)	
Per 100 ft of gross building area	15 GPD
PARKS (public)	
with comfort station equipped w/flush toilets (per person)	10 GPD
RECREATION BUILDINGS (per person)	2 GPD
RESTAURANTS	
24 hours, per seat	50 GPD
less than 24 hours, per seat	30 GPD
Fast Food served on paper plate, (per seat)	25 GPD
Drive-ins, per space	15 GPD
Carry-out facilities (in addition to seat & drive-in), per 100 sq . ft . of kitchen floor space plus, per employee	50 GPD 10 GPD

SCHOOLS	Elem.	High/Coll
Day - Per student or staff member	10	15
Add for shower/per student	5	5
add for cafeteria/per student or staff	5	5
Boarding School/per student	100	100
Dormitories/per student	100	100
SERVICE STATIONS		
Full service stations		
First two bays		750 GPD
each additional bay		300 GPD
per fuel pump		100 GPD
SELF-SERVICE STATIONS (no service bays)		
Per Fuel Pump		50 GPD
Convenience store (per 100 sq. ft . or fraction thereof)		25 GPD
SHOPPING CENTER		
Per sq. ft. of floor space; unless otherwise listed in this table or otherwise determined by the Town Engineer		0.1 GPD
STADIUMS, FRONTONS, BALL PARKS		
Per seat		3 GPD
STORES, RETAIL		
(per sq. ft. of floor space)		0.1 GPD
SPECULATION BUILDINGS		
(per sq. ft. of floor space) to be readjusted upon occupancy		0.1 GPD
THEATERS		
Indoor per seat		10 GPD
Outdoor, per speaker		
WAREHOUSES		
With bathroom facilities in each bay (per s.f. of floor space)		0.1 GPD
With remote bathroom facilities (per s.f. of floor space)		0.04 GPD

The LOS standard shall also reflect other level of service standards utilized by the Broward County Environmental Quality Control Board pertaining to sanitary sewer facilities. The level of service standard shall be used to determine service adequacy during the earliest of the following processes: time of plat approval for properties requiring platting; or, site plan approval for development which does not require (re)platting, pursuant to the Platting Requirement of the Plan Implementation Section of the Future Land Use Plan, or for property platted prior to March 20, 1979; or, building permit review for development not requiring (re)platting or site plan approval.

- **Policy 1-2:** All effluents, sludges and other by-products of the wastewater treatment process shall be disposed of in a manner acceptable to applicable regulatory agencies, and in an environmentally sound manner.
- **Policy 1-3:** Sanitary sewer facilities shall be extended, to the extent that it is financially feasible, to those portions of the Davie service areas not currently served.
- **Policy 1-4:** The Davie Utilities Department shall coordinate with developers in the provision of adequate sanitary sewer service within the Davie service areas, with developers assuming the cost and construction requirements for extension of the system to accommodate development.
- **Policy 1-5:** All development applications that are to be served by septic tank must receive DNRP approval for the use of septic tanks prior to the issuance of development permits from the Town.
- **Policy 1-6:** The Town shall identify areas served by septic tanks and sanitary sewer systems, including corresponding densities and soil suitability for septic tanks. The study, to be completed by December 31, 1999, will identify opportunities for sewer extension, where such extension will not encourage development contrary to plan objectives and policies regarding low residential density and semi-rural community character.

OBJECTIVE 2: Areas within the Town not served by the Town of Davie utilities systems shall be assured an adequate level of wastewater disposal treatment service.

- **Policy 2-1:** Through the Town's Development Review Process, and pursuant to applicable land development regulations, the Town may assure adequacy of service consistent with the level of service standards established by the Broward County Environmental Quality Control Board.

OBJECTIVE 3: Discourage urban sprawl by continuing to require the use of sanitary sewer facilities where service is available in a financially

feasible manner.

- **Policy 3-1:** Wastewater services shall be provided to users within the Davie service areas prior to expansion into new areas.

SOLID WASTE DISPOSAL

OBJECTIVE 4: Insure the provision of adequate solid waste disposal service, recognizing that solid waste disposal is a regional function, and emphasizing resource recovery.

- **Policy 4-1:** The level of service standards adopted by Broward County shall be applicable for the Town of Davie; specifically, the following levels shall be adopted and utilized to assess adequacy of service as follows:

<u>Land Use</u>	<u>Amount of Solid Waste</u>
Residential	8.9 lbs. per unit per day
Industrial and Commercial	
Factory/Warehouse	2 lbs. per 100 sq. ft. per day
Office Building	1 lb. per 100 sq. ft. per day
Department Store	4 lbs. per 100 sq. ft. per day
Supermarket	9 lbs. per 100 sq. ft. per day
Restaurant	2 lbs. per meal per day
Drug Store	5 lbs. per 100 sq. ft. per day
School	
Grade School	10 lbs. per room & 1/4 lbs. per pupil per day
High School	8 lbs. per room & 1/4 lbs. per pupil per day
Institution	
Hospital	8 lbs. per bed per day
Nurse or Intern Home	3 lbs. per person per day
Home for Aged	3 lbs. per person per day
Rest Home	3 lbs. per person per day

(Source: Broward County Solid Waste Element)

The level of service standard shall be used to determine service adequacy during the earliest of the following processes: time of plat approval for properties requiring platting; or, site plan approval for development which does not require (re)platting, pursuant to the Platting Requirement of the Plan Implementation Section of the Future Land Use Plan, or for property platted prior to March 20, 1979; or, building permit review for development not requiring (re)platting or site plan

approval.

- **Policy 4-2:** Coordinate with appropriate regulatory agencies in the review and monitoring of procedures necessary to insure safe disposal of hazardous and biohazards wastes.

OBJECTIVE 5: The Town shall reduce by 30% the volume of landfilled materials, consistent with the County's overall 30% reduction.

- **Policy 5-1:** Coordinate with Broward County in its efforts to reduce the waste stream by encouraging source separation and recycling of solid waste.

DRAINAGE AND NATURAL GROUNDWATER AQUIFER RECHARGE

OBJECTIVE 6: The Town shall guide development in accord with practices that assure reasonable flood protection and promote aquifer recharge.

- **Policy 6-1:** The level of service for water management shall consist of the following minimum design criteria:
 - Federal Emergency Management Administration (F.E.M.A.) criteria for minimum floor elevations of building sites, floodplain protection provisions.
 - Maximum allowable discharges of 3/4" per acre per day for properties west of 100th Avenue, and 1 1/2" per acre per day for properties east of 100th Avenue.
- **Policy 6-2:** Continue to work with the drainage districts exercising jurisdiction in the Town to insure provision of adequate improvements to the drainage system concurrent with development impacts. This shall be accomplished throughout the Development Review process, which shall assess the adequacy of essential service at the time of plat approval for properties requiring platting, and at site plan approval for properties not requiring platting.
- **Policy 6-3:** Restrict on-site discharges within wellfield protection areas as depicted on the Future Land Use Plan map series and in accord with the Broward County Potable Water Supply Wellfield Protection Ordinance.
- **Policy 6-4:** Promote aquifer recharge by encouraging the provision of adequate green open space in all development through the Zoning Ordinance.
- **Policy 6-5:** Encourage and facilitate the creation and maintenance of revegetated wetlands, including mitigation sites, in areas of the Town that maximize the natural ecological benefits of such

aquifer recharge sites.

- **Policy 6-6:** The Town adopts by reference the water quality standards contained in Article V, chapter 27 of the Broward County Code.
- **Policy 6-7:** The Town shall utilize the long-range water supply plans of the SFWMD as "best available information" under the requirements of the Growth Management Act, Chapter 163 F.S.
- **Policy 6-8:** The Town shall adopt the SFWMD standards for minimum stormwater flows and levels.

POTABLE WATER SERVICE

OBJECTIVE 7: The Town shall provide adequate potable water service to the Davie service areas in a manner consistent with regulations promulgated by applicable regulatory agencies.

- **Policy 7-1:** The Level of Service (LOS) standard for potable water facilities is herein adopted to be 150 gallons per capita per day (gpcd), also described as 350 gallons per day (gpd) per equivalent residential connection (ERC). The ERC for non-residential, commercial, industrial or institutional connections shall be based on the flow table included in Policy 1.1) The LOS standard shall also reflect other level of service standards utilized by the Florida Department of Health and Rehabilitative Services, through its Public Health Unit, for potable water service. The level of service standard shall be used to determine service adequacy during the earliest of the following processes: time of plat approval for properties requiring platting; or, site plan approval for development which does not require (re)platting, pursuant to the Platting Requirement of the Plan Implementation Section of the Future Land Use Plan, or for property platted prior to March 20, 1979; or, building permit review for development not requiring (re)platting or site plan approval.
- **Policy 7-2:** All by-products of the water treatment process shall be disposed of in a manner acceptable to applicable regulatory agencies, and in an environmentally sound manner.
- **Policy 7-3:** Potable water facilities shall be extended, to the extent that it is financially feasible, to those portions of the Davie service areas not currently served by the municipal system.
- **Policy 7-4:** The Davie Utilities Department shall coordinate with developers in the provision of adequate potable water services within the Davie service areas, with developers assuming the cost and construction requirements for extension of the system to accommodate development.

- **Policy 7-5:** The Town shall coordinate with appropriate entities, including the South Florida Water Management District, in encouraging, implementing and publicizing conservation techniques during water conservation periods.
- **Policy 7-6:** Land development regulations shall encourage the use of native vegetation and xeriscape in new development, to reduce dependency on potable water supply.

OBJECTIVE 8: Areas within the Town not served by the Town of Davie systems shall be assured an adequate level of potable water service.

- **Policy 8-1:** Through the Town's Development Review Process, and pursuant to applicable land development regulations, the Town may assure adequacy of service consistent with the level of service standards established by the Florida Department of Health and Rehabilitative Services, through its Public Health Unit.

OBJECTIVE 9: Discourage urban sprawl by continuing to require the use of municipal potable water service where service is available in a financially feasible manner.

- **Policy 9-1:** Potable water service shall be provided to users within the Davie service areas prior to expansion into new areas.

**Sanitary Sewer, Solid Waste, Drainage,
Potable Water, and Natural Groundwater
Aquifer Recharge Element
Plan Implementation Section:**

All departments in the Town participating in the implementation of this Element shall be required to operate within the framework established by the Goals, Objectives and Policies. All decision-making with regard to capital improvements and expenditures, shall reflect the Goals, Objectives and Policies. Annual budget review and capital improvement programming shall reflect consideration of needs that have been determined with respect to the Goals, Objectives and Policies.

Town land development regulations shall be amended, as necessary, to implement the requirements of this Element.

**Sanitary Sewer, Solid Waste, Drainage,
Potable Water, and Natural Groundwater
Aquifer Recharge Element:
Monitoring and Evaluation Procedures**

The following procedures address the requirement of Chapter 9J-5, F.A.C. to provide monitoring and evaluation procedures for each element:

- Continued compliance with regulations promulgated by appropriate regulatory agencies which address the quality and quantity of services (Objectives 1,6)
- Coordination with providers of services within the Town other than the Town of Davie, to insure adequate services at acceptable levels of service (Objectives 2, 7).
- Demonstrable growth in the number of customers served, in accordance with the Capital Improvements Program (Objectives 3, 8).
- Maintenance of favorable bond rating for municipal improvements.

The Town shall annually:

- evaluate adopted Levels of Service for potable water, sanitary sewer, solid waste and drainage facilities to determine if standards adopted in this Element have been met.
- assess compliance with the concurrence management system through determination of whether or not adequate Levels of Service for utilities facilities serving Davie have been met.
- update capacity and demand information on an annual basis for utilities facilities serving Davie.
- monitor the extent of urban sprawl through an analysis of service and facility extensions. The analysis shall consider compliance with Policies 3-1 and 8-1 which promote development within areas where facilities and services are available before extending service areas.
- assess coordination mechanisms with Broward County on the closed Broward Landfill clean-up by evaluating groundwater impacts and progress towards creating a park facility on the site.

Sanitary Sewer, Solid Waste, Drainage, Potable Water and Natural Groundwater Aquifer Recharge Element:

Glossary

- **Building:** any structure having a roof and used or built for the shelter or enclosure of persons, animals, chattels, or property of any kind.
- **Building Permit:**
 - (1) Any permit for the erection or construction of a new building required by Section 301.1 of the South Florida Building Code, 1984, Broward Edition, as amended.
 - (2) Any permit for an addition to an existing building which would:
 - (a) create one or more additional dwelling units, or
 - (b) involve a change in the occupancy of a building as described in Section 104.7 of the South Florida Building Code, 1984, Broward Edition, as amended.
 - (3) Any permit which would be required for the nonresidential operations included in Section 301.1(a) of the South Florida Building Code, 1984, Broward Edition, as amended.
- **Capital Budget:** the portion of the local government's budget reflecting capital improvements scheduled for a fiscal year.
- **Capital Improvement:** physical assets constructed or purchased to provide, improve or replace a public facility and which are large scale and high in cost. The cost of a capital improvement is generally nonrecurring and may require multi-year financing. For the purpose of this rule, physical assets which have been identified as existing or projected needs in the individual comprehensive plan elements shall be considered capital improvements.
- **Concurrence:** public facilities and services needed to support development shall be available at the same time or coincidental with the impacts of such development.
- **Cone of Influence (Zone of Influence):** an area around one or more major waterwells, the boundary of which is determined by the government agency having specific statutory authority to make such a determination based on groundwater travel or drawdown depth.
- **Conservation Uses:** activities within land areas designated for the purpose of conserving or protecting natural resources or environmental quality and includes areas designated for such purposes as flood control, protection of quality or quantity of groundwater or surface water, floodplain management, fisheries management, or protection of vegetative communities or wildlife habitats. Conservation Uses are further defined in the Conservation land use

category, as described in the Permitted Uses portion of the Plan Implementation Section.

- **Consistency:** For purposes of this definition, a local comprehensive plan is said to be consistent with the state comprehensive plan and the regional policy plan if it is "compatible with" or "furthers" such plans. The term "compatible with" means that the local plan is not in conflict with the state comprehensive plan or regional policy plan. The term "furthers" means to take action in the direction of realizing goals or policies of the state or regional plan.
- **Developer:** any person, including a governmental agency, undertaking any development.
- **Development:**
 - (1) The carrying out of any building activity or mining operation, the making of any material change in the use of appearance of any structure or land, or the dividing of land into two or more parcels.
 - (2) The following activities or uses shall be taken for the purposes of this chapter to involve "development", as defined in this section:
 - (a) A reconstruction, alteration of the size, or material change in the external appearance of a structure on land.
 - (b) A change in the intensity of use of land, such as an increase in the number of dwelling units in a structure or on land or a material increase in the number of businesses, manufacturing establishments, offices, or dwelling units in a structure or on land.
 - (c) Alteration of a shore or bank of a seacoast, river, stream, lake, pond or canal, including any "coastal construction" as defined in Section 161.021, Florida Statutes.
 - (d) Commencement of drilling, except to obtain soil samples, mining, or excavation on a parcel of land.
 - (e) Demolition of a structure.
 - (f) Clearing of land as an adjunct of construction.
 - (g) Deposit of refuse, solid or liquid waste, or fill on a parcel of land.
 - (3) The following operations or uses shall not be taken for the purpose of this chapter to involve "development" as defined herein:
 - (a) Work by a highway or road agency or railroad company for the maintenance or improvement of a road or railroad tract, if the work is carried out on land within the boundaries of the right-of-way.
 - (b) Work by any utility and other persons engaged in the distribution or transmission of gas or water, for the purpose of inspecting, repairing, renewing, or constructing on established rights-of-way any sewers, mains, pipes, cables, utility tunnels, powerlines, towers, poles, tracts, or the like.
 - (c) Work for the maintenance, renewal, improvement, or alteration of any structure, if the work affects only the interior or the color of the structure or the decoration of the exterior of the structure.

- (d) The use of any structure or land devoted to dwelling uses or any purpose customarily incidental to enjoyment of the dwelling.
 - (e) The use of any land for the purpose of growing plants, crops, trees and other agricultural or forestry products; raising livestock; or for other agricultural purposes.
 - (f) A change in use of land or structure from a use within a class specified in an ordinance or rule to another use in the same class.
 - (g) A change in the ownership or form of ownership of any parcel or structure.
 - (h) The creation or termination of rights of access, riparian rights, easements, covenants concerning development of land, or other rights in land.
- (4) "Development," as designated in an ordinance, rule, or development rule includes all other development customarily associated with it unless otherwise specified. When appropriate to the context, "development" refers to the act of developing to the result of development. Reference to any specific operation is not intended to mean that the operation or activity, when part of other operations or activities, is not development. Reference to particular operations is not intended to limit the generality of subsection (1).

- **Development Order:** any order granting, denying, or granting with conditions an application for a development permit.
- **Development Permit:** any building permit, zoning permit, plat approval or rezoning, certification, variance, or other action having the effect of permitting development.
- **Drainage Facilities:** a system of man-made structures designed to collect, convey, hold divert or discharge stormwater, and includes stormwater sewers, canals, detention structures, and retention structures.
- **Dwelling Unit:** a house, apartment, or condominium unit, trailer, group of rooms, or a single room intended for occupancy as separate living quarter with direct access from the outside of the building or through a common hall and with complete kitchen facilities for the exclusive use of the occupants, including rental units contained in a multi-unit structure or complex which are licensed by the State Department of Business Regulation, Division of Hotels and Restaurants, as "apartments", "rental condominiums" and "Retirement Housing".
- **Environmentally Sensitive Land:** those areas containing Natural Resources, as depicted in the Future Land Use Plan Map Series.
- **Flood Plains:** areas inundated during an identified flood event or identified by the National Flood Insurance Program as an A Zone or V Zone on Flood Insurance Rate Maps or Flood Hazard Boundary Maps.

- **Hazardous waste:** solid waste, or a combination of solid wastes, which, because of its quantity, concentration, or physical, chemical, or infectious characteristics, may cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible illness or may pose a substantial present or potential hazard to human health or the environment when improperly transported, disposed of, stored, treated or otherwise managed.
- **Infrastructure:** those man-made structures which serve the common needs of the population, such as: sewage disposal systems; potable water systems; potable water wells serving a system; solid waste disposal sites or retention areas; stormwater systems; utilities; piers; docks; wharves; breakwaters; bulkheads; seawalls; bulwarks; revetments; causeways; marinas; navigation channels; bridges; and roadways.
- **Level of Service:** an indicator of the extent or degree of service provided by, or proposed to be provided by a facility based on and related to the operational characteristics of the facility. Level of service shall indicate the capacity per unit of demand for each public facility.
- **Nonpoint Source Pollution:** any source of water pollution that is not a point source.
- **Point Source Pollution:** any source of water pollution that constitutes a discernible, confined, and discrete conveyance, including but not limited to any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock, concentrated animal feeding operation, or vessel or other floating craft, from which pollutants are or may be discharged. This term does not include return flows from irrigated agriculture.
- **Pollution:** the presence in the outdoor atmosphere, ground or water of any substances, contaminants, noise, or manmade or man-induced alteration of the chemical, physical, biological, or radiological integrity of air or water, in quantities or at levels which are or may be potentially harmful or injurious to human health or welfare, animal or plant life, or property, or unreasonably interfere with the enjoyment of life or property.
- **Potable Water Facilities:** a system of structures designed to collect, treat, or distribute potable water, and includes water wells, treatment plants, reservoirs, and distribution mains.
- **Sanitary Sewer Facilities:** structures or systems designed for the collection, transmission, treatment, or disposal of sewage and includes trunk mains, interceptors, treatment plants and disposal systems.

- **Services:** the programs and employees determined necessary by local government to provide adequate operation and maintenance of public facilities and infrastructure as well as those educational, health care, social and other programs necessary to support the programs, public facilities, and infrastructure set out in the local plan or required by local, state or federal law.
- **Solid Waste:** sludge from a waste treatment works, water supply treatment plant or air pollution control facility or garbage, rubbish, refuse, or other discarded material, including solid, liquid, semisolid, or contained gaseous material resulting from domestic, industrial, commercial, mining, agricultural, or governmental operations.
- **Solid Waste Facilities:** structures or systems designed for the collection, processing or disposal of solid wastes, including hazardous wastes, and includes transfer stations, processing plants, recycling plants, and disposal systems.
- **Water Wells:** wells excavated, drilled, dug, or driven for the supply of industrial, agricultural or potable water for general public consumption.