FEASIBILITY OF A SALTWATER BARRIER INJECTION WELL SYSTEM MANATEE, SARASOTA, CHARLOTTE COUNTIES FLORIDA

NOVEMBER 1988

BY

D.A. SMITH, M.H. BEACH AND G.M. KELLEY

SOUTHWEST FLORIDA WATER MANAGEMENT DISTRICT
2379 BROAD STREET
BROOKSVILLE, FLORIDA 34609-6899

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

EXECUTIVE SUMMARY

The idea of creating a hydraulic barrier to saltwater intrusion using injection wells has merit and should be implemented where the hydrogeologic framework and source water availability combine to make the concept feasible. Unfortunately, along the coast of Manatee, Sarasota, and Charlotte Counties, the hydrogeologic framework and hydraulic setting of the Floridan aquifer are such that the proposed saltwater barrier project is not feasible.

The most important element of the hydrogeologic framework that makes a barrier not feasible in the project area, is that relatively high heads are already present in the Floridan aquifer along most of the coast in this area. In the southern part of the Southwest Florida Water Management District, the Floridan aquifer contains poor quality water not because of lateral saltwater intrusion, but because of the presence of connate or relict sea water that has not been completely flushed out of the aquifer.

A second concern that may make the proposal unworkable is a possibility of the barrier causing a decline in the quality of water in the intermediate aquifer system. In the coastal area south of Manatee County, most public supplies obtained from ground water are obtained from the intermediate aquifer system. Very near the coast, the intermediate aquifer system is showing effects of lateral saltwater intrusion due to heavy pumpage in the intermediate. However, because the Floridan aquifer potentiometric levels are higher than the levels in the intermediate system everywhere along the proposed boundary, upward leakage of mineralized water from the Floridan is also contributing to poor water quality in the intermediate, and raising the head in the Floridan would increase the upward leakage.

Although the project is not feasible for the Floridan aquifer, smaller segments of a saltwater barrier may be appropriate, most likely in the intermediate system in parts of the area that are heavily pumped for public supply. A smaller scale barrier, similar in scope to successful projects in other regions, would be appropriate because the portions of the coastline that are the most populous and thus have the highest water demand, are also the portions that would have the largest and most proximal source of treated wastewater.

Smaller scale feasibility projects should be examined in detail, and should use solute transport modeling with very fine model grid spacing.

SALTWATER BARRIER/RECHARGE WELL
FEASIBILITY STUDY
PROJECT REPORT

1.0 INTRODUCTION

The District received a 1988 funding proposal for a cooperative project to investigate the feasibility of constructing a recharge barrier to saltwater intrusion along the Manatee, Sarasota, and Charlotte County coastlines (Figure 1). This report describes the project results and recommendations from a District-conducted in-house feasibility study.

The District in-house study included three elements: 1) a hydrogeologic reconnaissance to examine the hydraulics of the aquifer systems in the study area, 2) an examination of the water sources (quality and quantity) available for recharge, and the government regulations that would apply to a recharge injection project, and 3) a simple numerical modeling exercise to examine the project's feasibility.

1.1 STATEMENT OF PROBLEM

Water resources in the Manasota Basin and lower Peace River Basins are currently limited by poor quality ground water in the

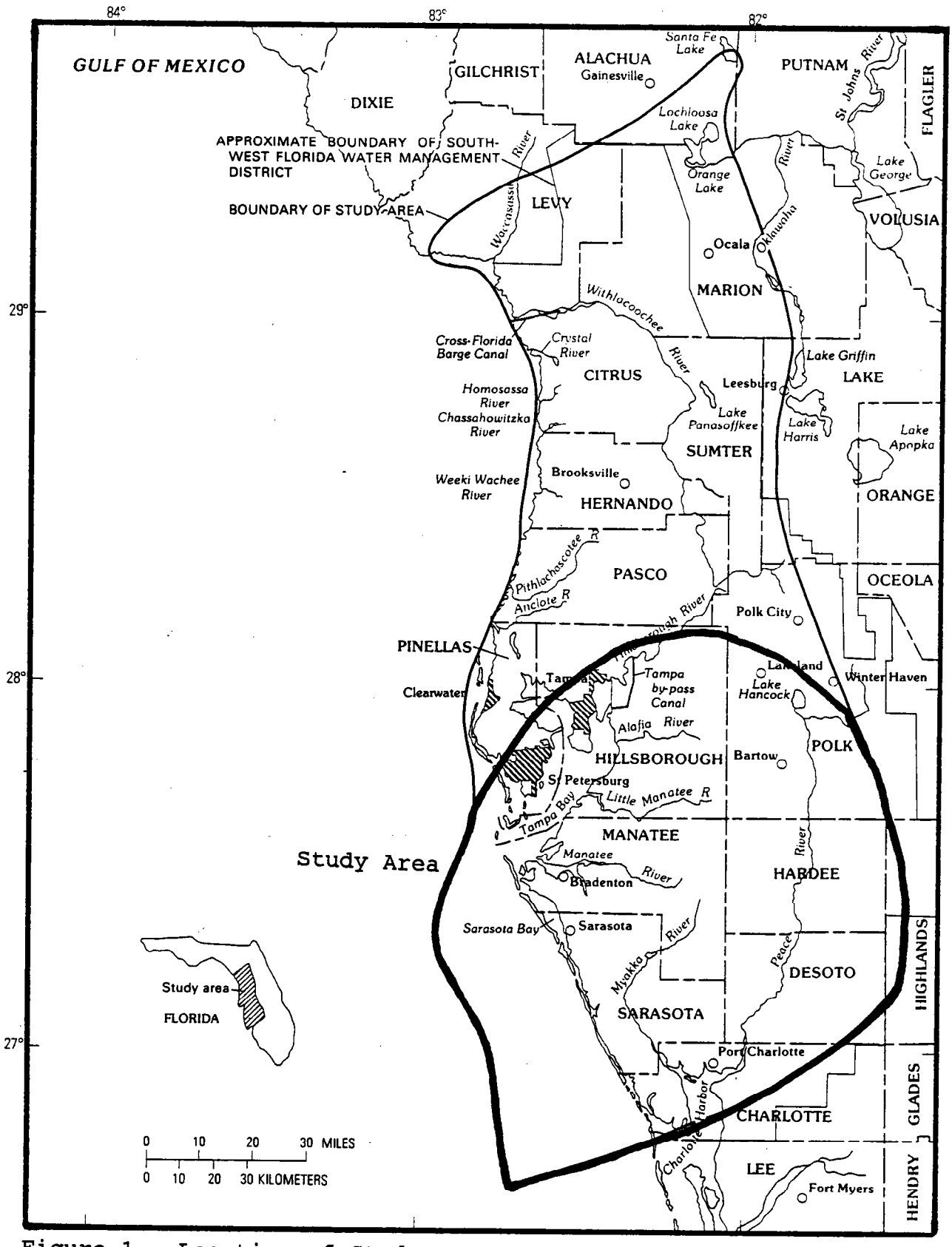

Figure 1. Location of Study Area.

Floridan aquifer and poor quality ground water in the intermediate and surficial aquifer systems in the southern and coastal parts of the basins (Figure 2). In spite of these natural restrictions, population growth and water demand in this region are continuing at a significant rate. These regions have developed surface water supplies in partial response to the lack of good quality ground-water resources.

Water in the coastal region of the Southwest Florida Water Management District from Manatee County southward is a saline sodium magnesium chloride type water. This saline water in the Floridan aquifer is the probable result of past marine inundations and subsequent mixing and reaction (Steinkampf, 1982). This means that the water is probably not saline due to lateral saltwater intrusion except very near the coast.

Increased water production in this region has resulted in limited saltwater intrusion in the Floridan and intermediate aquifers immediately along the coast. Some coastal irrigation wells have been abandoned due to high salt content, as have some public supply wells which can no longer be cost effectively treated by reverse osmosis.

This situation of high saline water in the Floridan and intermediate aquifer systems occurs, not for a lack of rainfall, but as a result of the physiography and hydrogeology of the area.

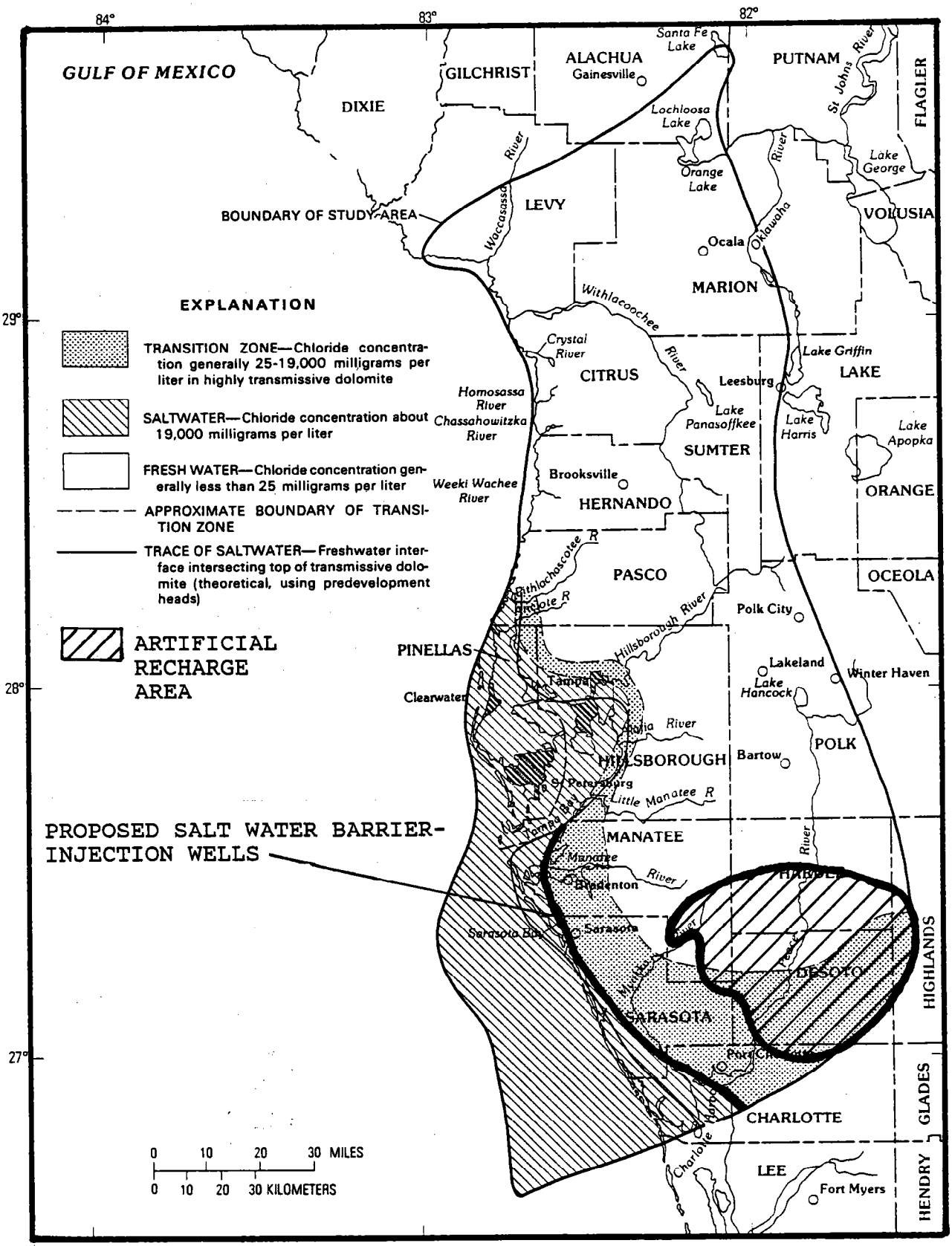

FIGURE 2. Saltwater-Freshwater Transition zone in the highly permeable dolomite of the Upper Floridan aquifer. (Hickey, 1981, Fig. 15: Wilson, 1982, Fig. 7)

Recharge to the Floridan aquifer is limited due to the thick confining layers overlying the Floridan and due to much of the area being a discharge area.

1.2 PROJECT OBJECTIVE

The objective of this project was to analyze the feasibility of establishing a hydraulic barrier to saltwater intrusion in the Floridan aquifer along the Manatee, Sarasota, and Charlotte County coastlines, and to analyze the feasibility of improving water quality behind the barrier using artificial recharge in the area shown on Figure 2. The hydraulic barrier would be constructed using a series of injection wells along the coast, and the water quality improvement was proposed to be implemented by developing gravity recharge wells to connect the surficial aquifer and the Floridan aquifer in an area behind the barrier.

2.0 HYDROGEOLOGIC RECONNAISSANCE

A hydrogeologic reconnaissance of the area was performed including examination of hydrogeologic cross sections; head difference maps between the surficial, intermediate, and Floridan aquifer systems; and water quality maps for each of the systems.

The locations of the cross sections are shown on Figure 3. The cross sections show the hydrostratigraphy of the aquifer system.

Head difference maps and potentiometric surface maps were examined to determine the differences in water levels and the altitude of the water level in and between the surficial and the Floridan aquifers. The head differences were examined to insure that a gravity connector well in the artificial recharge area would cause a downward flow from the surficial to the Floridan. The altitude of the potentiometric surface of the Floridan aquifer was also examined to insure that injection along the coast can be performed effectively.

Water quality maps showing the concentration of chlorides, sulfates, and total dissolved solids (TDS) in the surficial and Floridan systems were also examined. Water quality in the surficial system in the "artificial recharge improvement" area was examined to insure that it is suitable for recharge to the

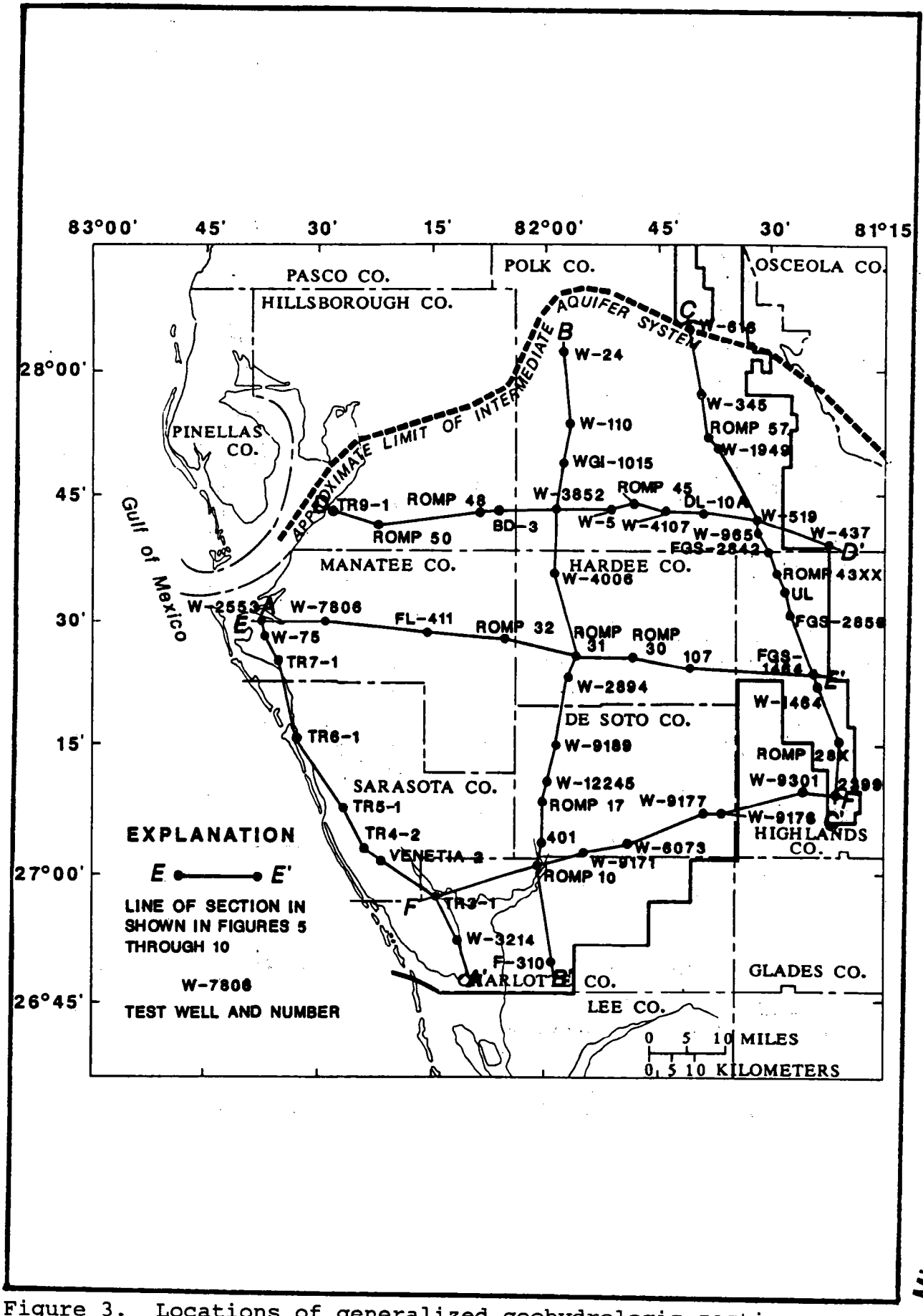

Figure 3. Locations of generalized geohydrologic sections (Duerr and others, 1988)

Floridan aquifer. Knowledge of the water quality in the Floridan aquifer in the barrier area will be important to identify the quality of water suitable for injection.

2.1 HYDROSTRATIGRAPHY

The locations of four generalized hydrostratigraphic cross-sections are shown on Figure 3. The four sections (Figure 4, 5, 6, and 7) show that the aquifer system in the study area includes a surficial aquifer, an intermediate confined aquifer system, and the Floridan aquifer. The thickness of the surficial aquifer system ranges from approximately 20 to 100 feet in the project area.

Duerr, and others, 1988 define the intermediate aquifer system as including all water-bearing units between the overlying surficial aquifer system and the underlying Floridan aquifer system. In the project area the intermediate aquifer system ranges from less than 300 feet to greater than 800 feet in thickness. The Floridan aquifer system ranges in thickness from approximately 1200 feet in north Manatee County to more than 1400 feet in central Sarasota County.

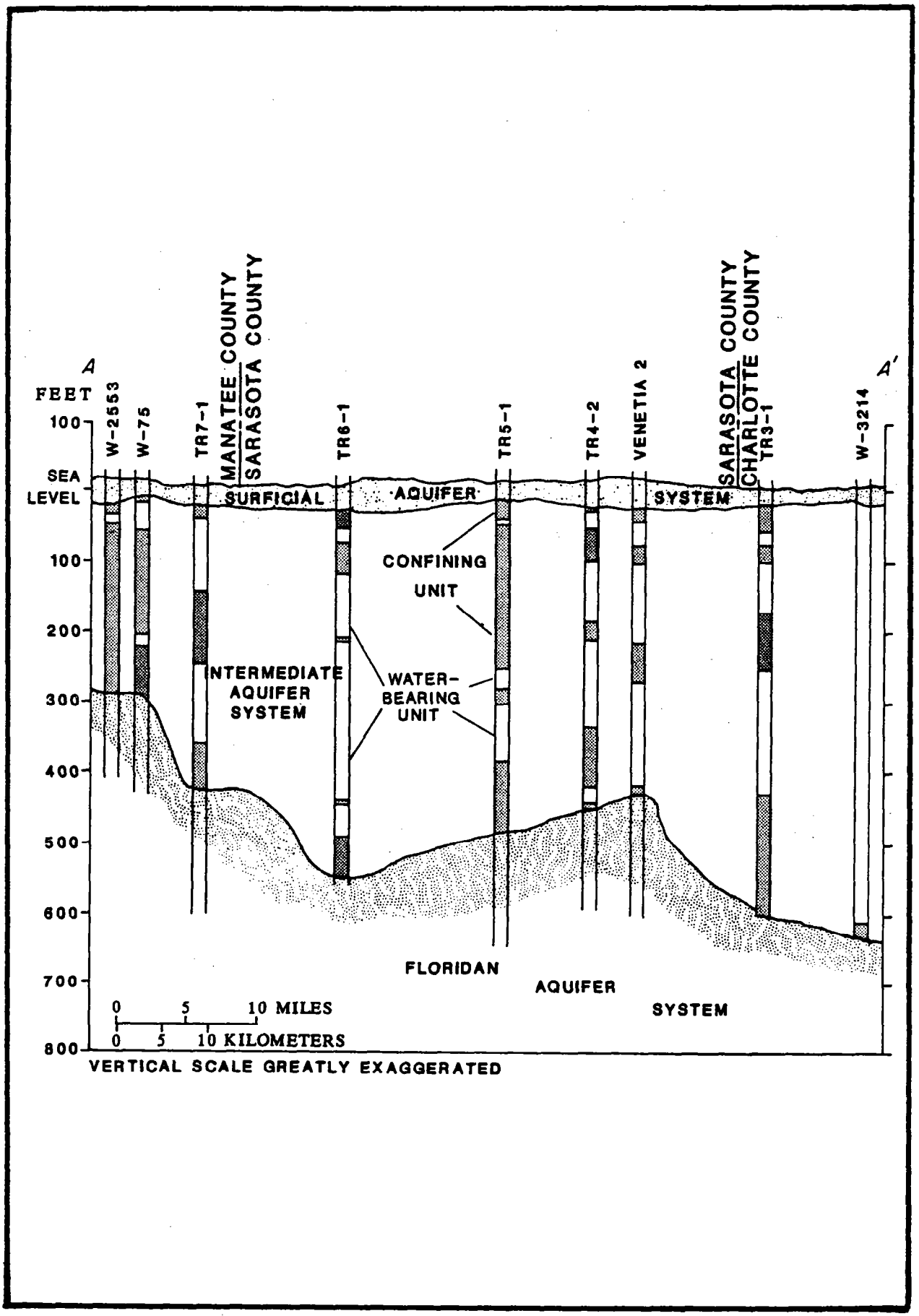

Figure 4. Generalized geohydrologic Section A-A'. (Duerr and others, 1988)

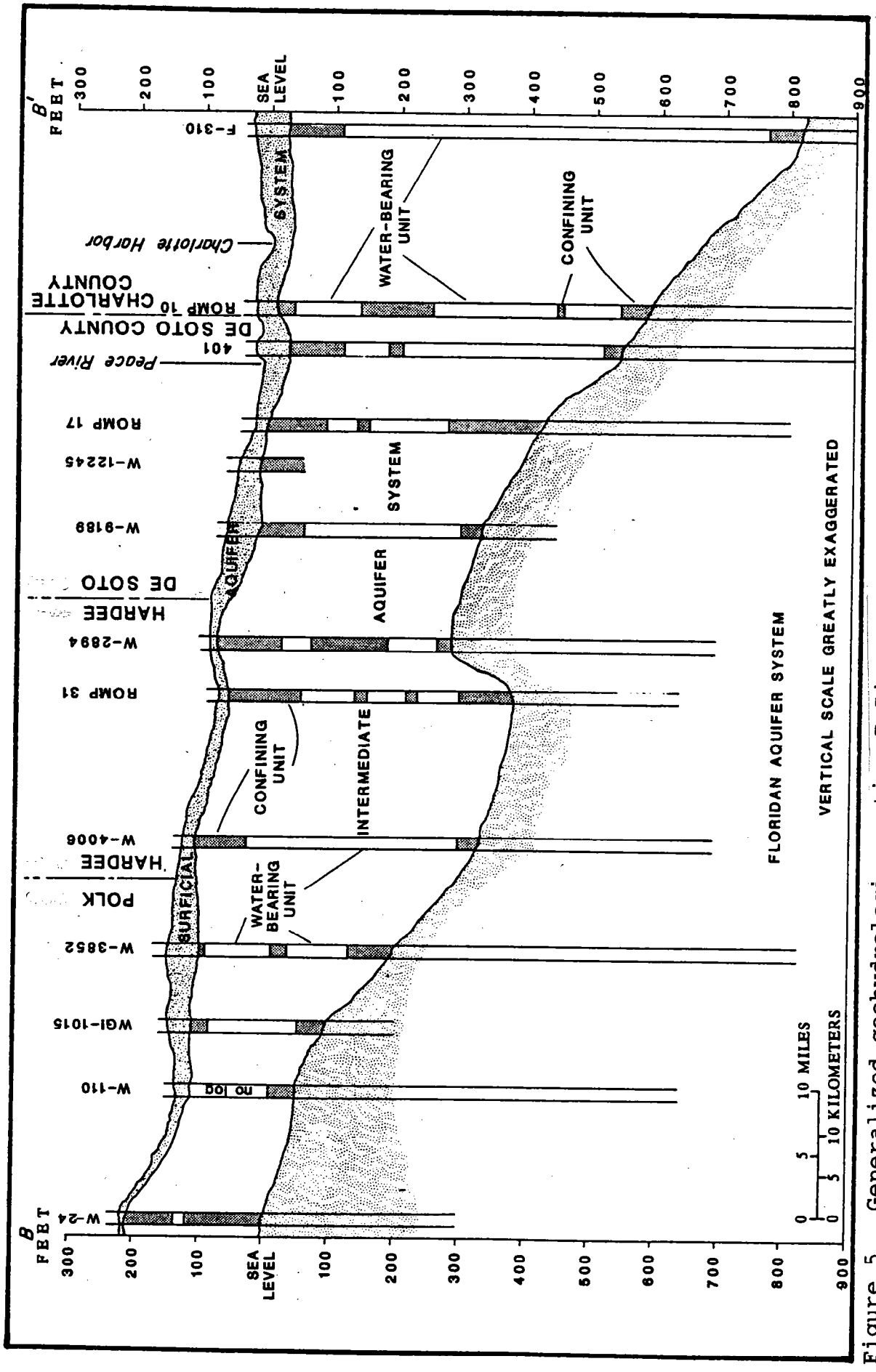

Figure 5. Generalized geohydrologic section B-B'. (Duerr and others, 1988)

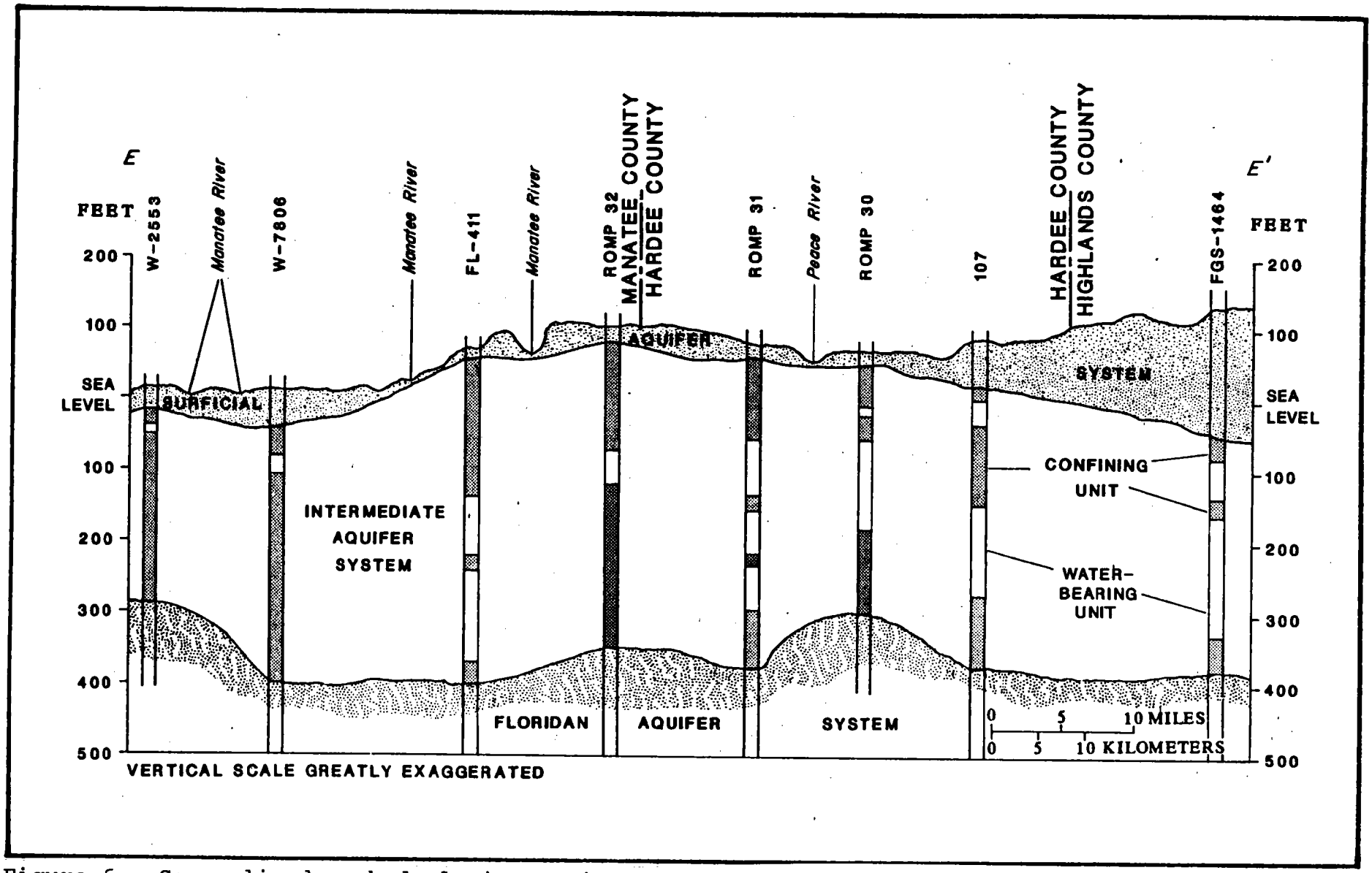

Figure 6. Generalized geohydrologic section E-E'.
(Duerr and others, 1988)

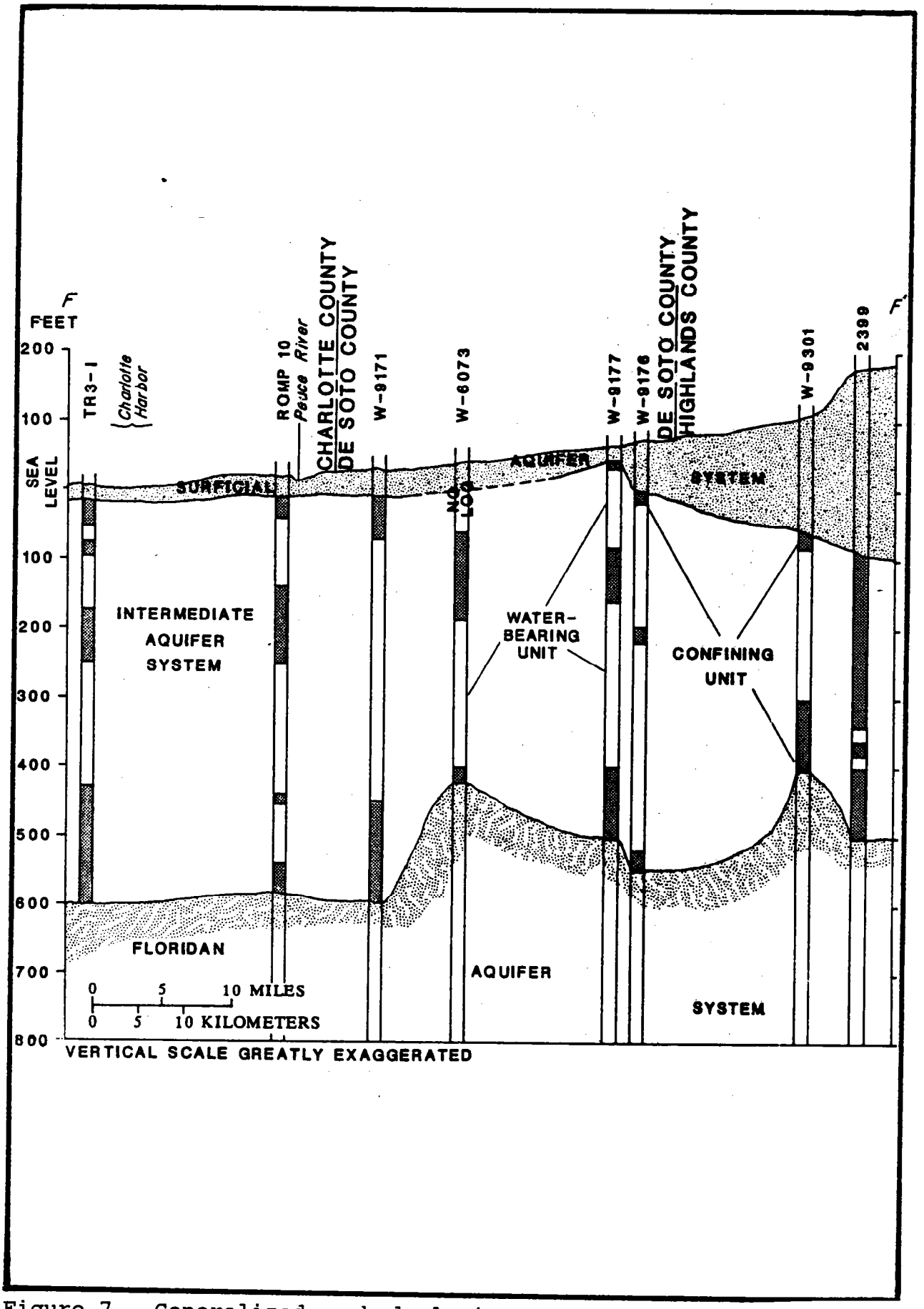

Figure 7. Generalized geohydrologic section F-F'. (Duerr and others, 1988)

2.2 POTENTIOMETRIC SURFACE DIFFERENCE MAPPING

Head difference profiles along the line proposed for the barrier were constructed to show the heads in the surficial, intermediate, and Floridan aquifer systems. Profiles were constructed for May and September 1987 (Figures 8 and 9). The profiles show that the heads in the Floridan aquifer along the proposed boundary range from 8 to 40 feet above National Geodetic Vertical Datum (NGVD) in May and from 14 to 40 feet above NGVD in September. These are already relatively high heads with respect to saltwater intrusion. That the heads in the Floridan are already high means that a barrier boundary may not be feasible in the Floridan aquifer in this area.

The difference between the water table elevation and the Floridan potentiometric surface in May and September, 1987 was also mapped in the area designated as the artificial recharge area in Hardee and Desoto Counties (Figures 10 and 11). Figure 10 and 11 show that the Floridan aquifer potentiometric surface was higher than the water table in approximately one fourth of the area proposed for recharge. Where the Floridan potentiometric level is higher than the water table, the poorer quality water in the Floridan aquifer would flow upward rather than the better quality water in the surficial aquifer flowing downward. In these areas, connector wells between the Floridan and the surficial aquifers would of course not be feasible to improve the water quality in

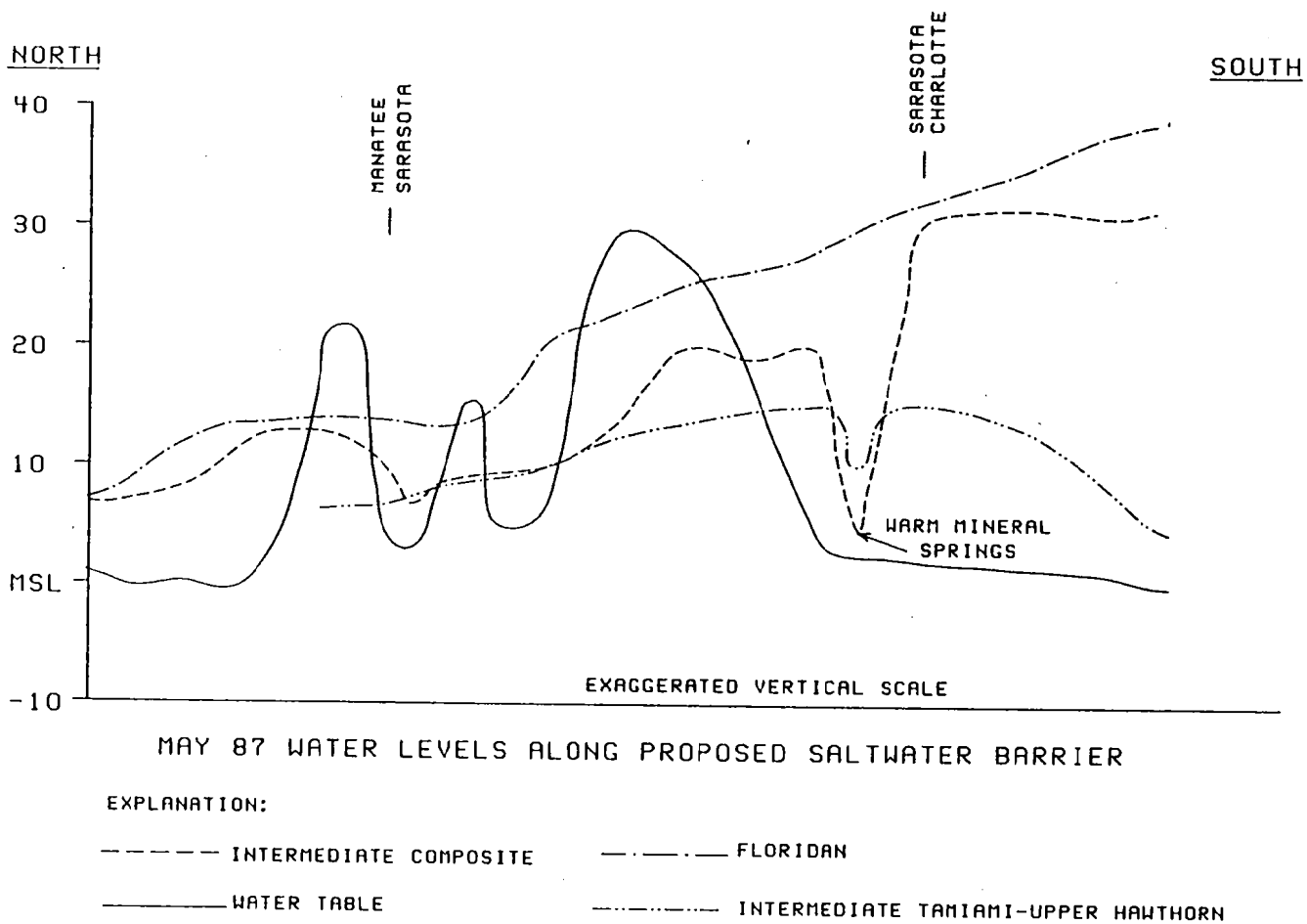

Figure 8. Profile of aquifer water levels along the proposed Saltwater Barrier in May 1987. (Lewelling, 1987, 1987a).

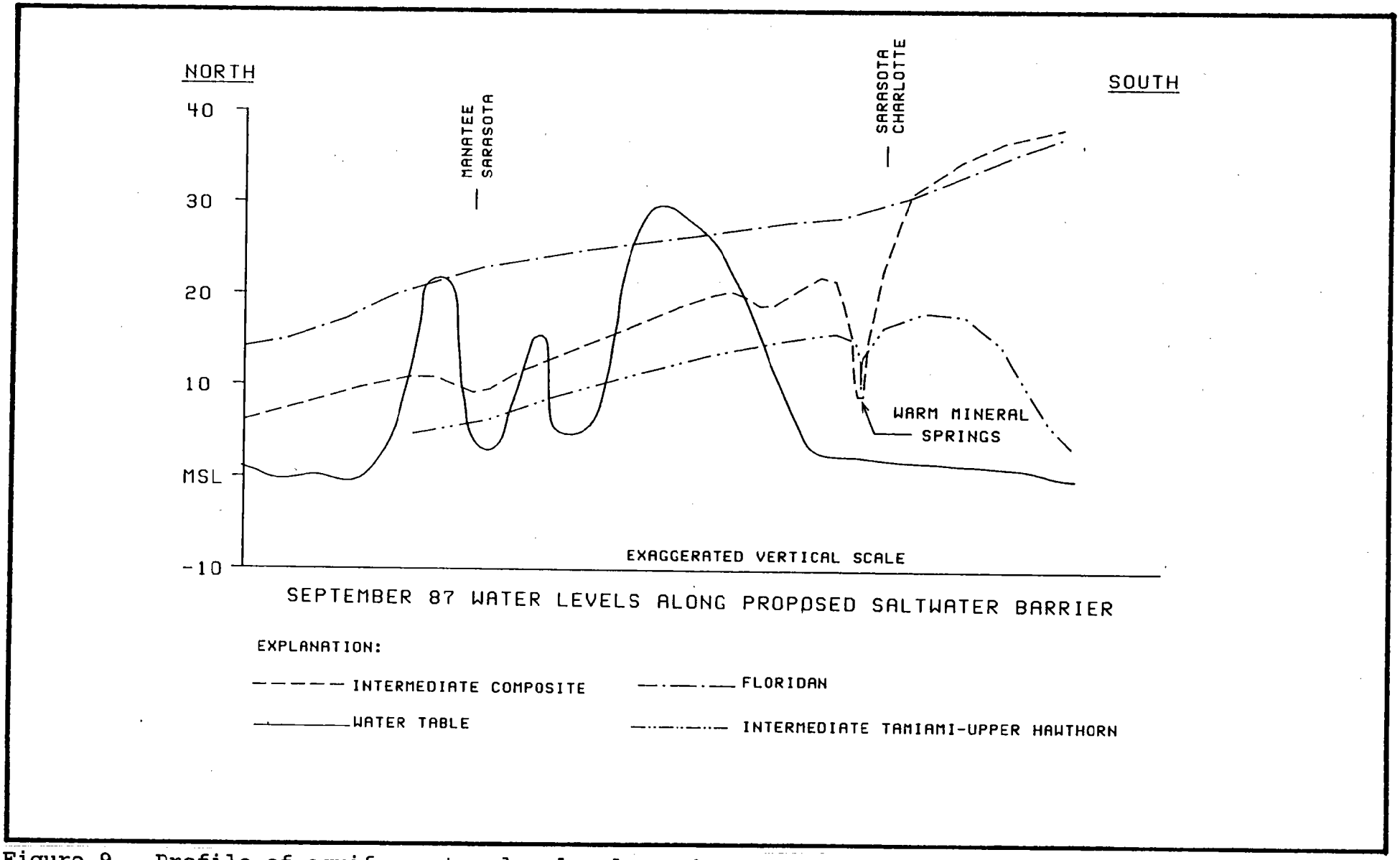

Figure 9. Profile of aquifer water levels along the proposed Saltwater Barrier in September 1987. (Lewelling, 1988, 1987b).

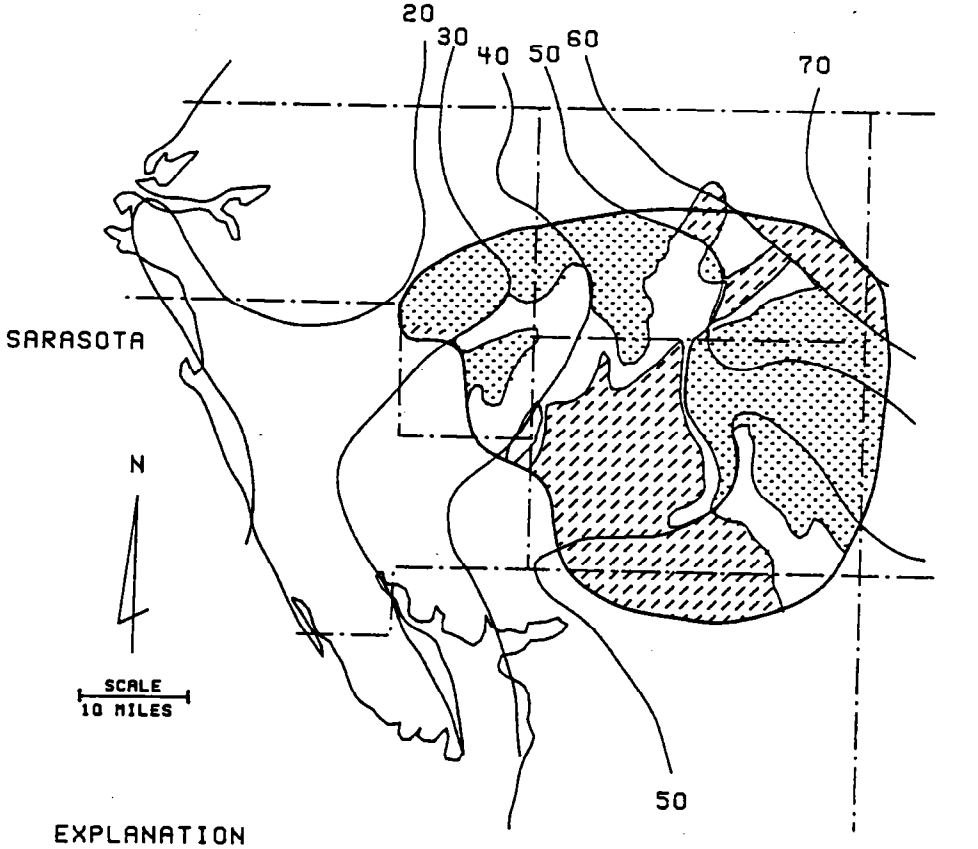

Figure 10. Differences between the water table and Floridan potentiometric surface in September, 1987.

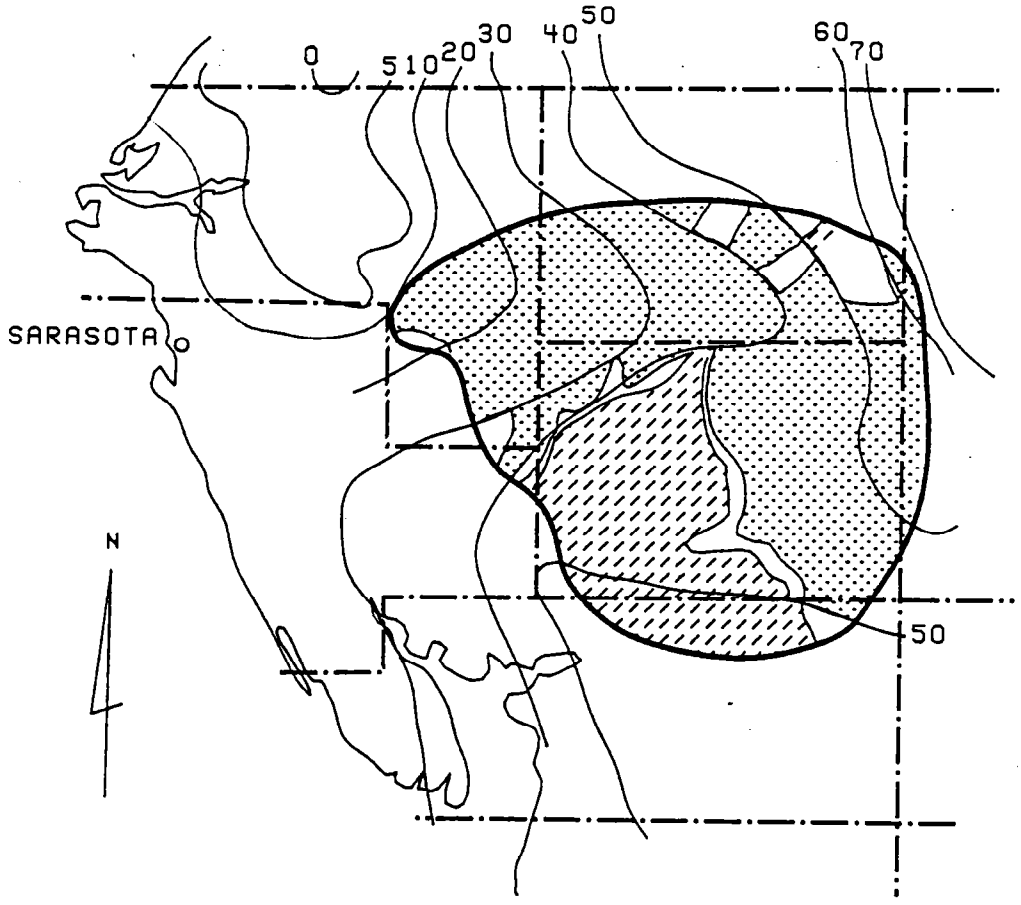

Figure 11. Differences between the water table and Floridan potentiometric surface in May, 1987.

the Floridan. In the areas mapped as having the water table at least 10 feet higher than the Floridan aquifer potentiometric level, connector wells could be a reliable method of recharging the Floridan aquifer. The area where the connector wells would be reliable is approximately half of the area proposed for recharge.

2.3 WATER QUALITY MAPPING

Maps showing the water quality in the surficial aquifer were examined to determine if the water quality in the surficial is suitable for recharging the Floridan. Figure 12 shows the total dissolved solids, total hardness, chloride, and sulfate in water in the surficial aquifer system. The figure shows that except for a small region in southern Hardee County, and small areas in Desoto County, water quality in general in the surficial aquifer would be suitable for recharging the Floridan aquifer. The areas that are mapped as having poor quality water are also areas where the elevation of the Floridan aquifer potentiometric level is higher than the water table.

Maps showing water quality in the upper Floridan aquifer were also examined to determine the quality of water suitable for injection into the Floridan to form the proposed barrier (Figure 13). Figure 13 shows that the existing quality of water in the upper producing interval of Floridan aquifer along the

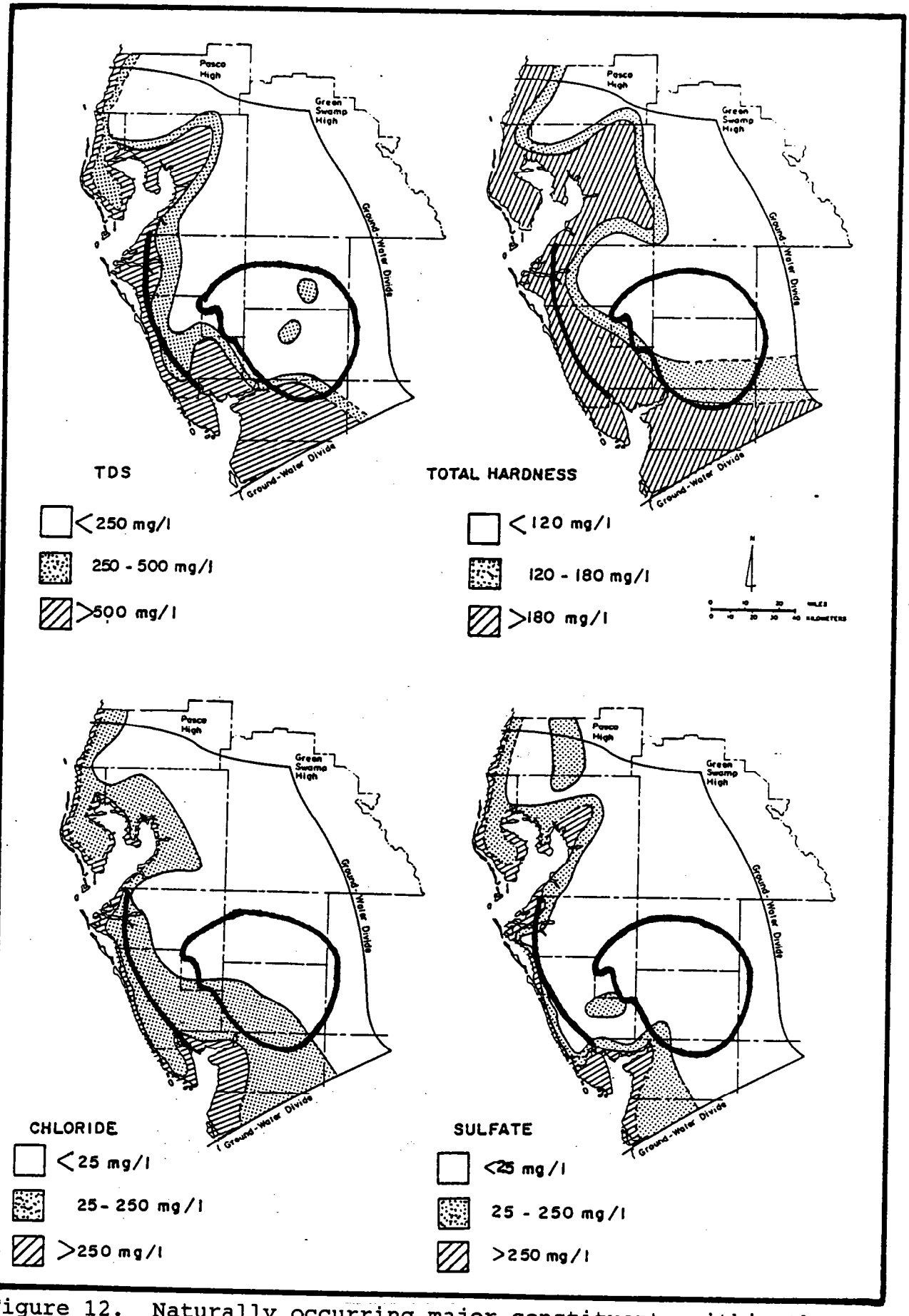

Figure 12. Naturally occurring major constituents within the surficial aquifer system in the Southern West-Central Florida Ground-Water Basin. (Moore and others, 1988)

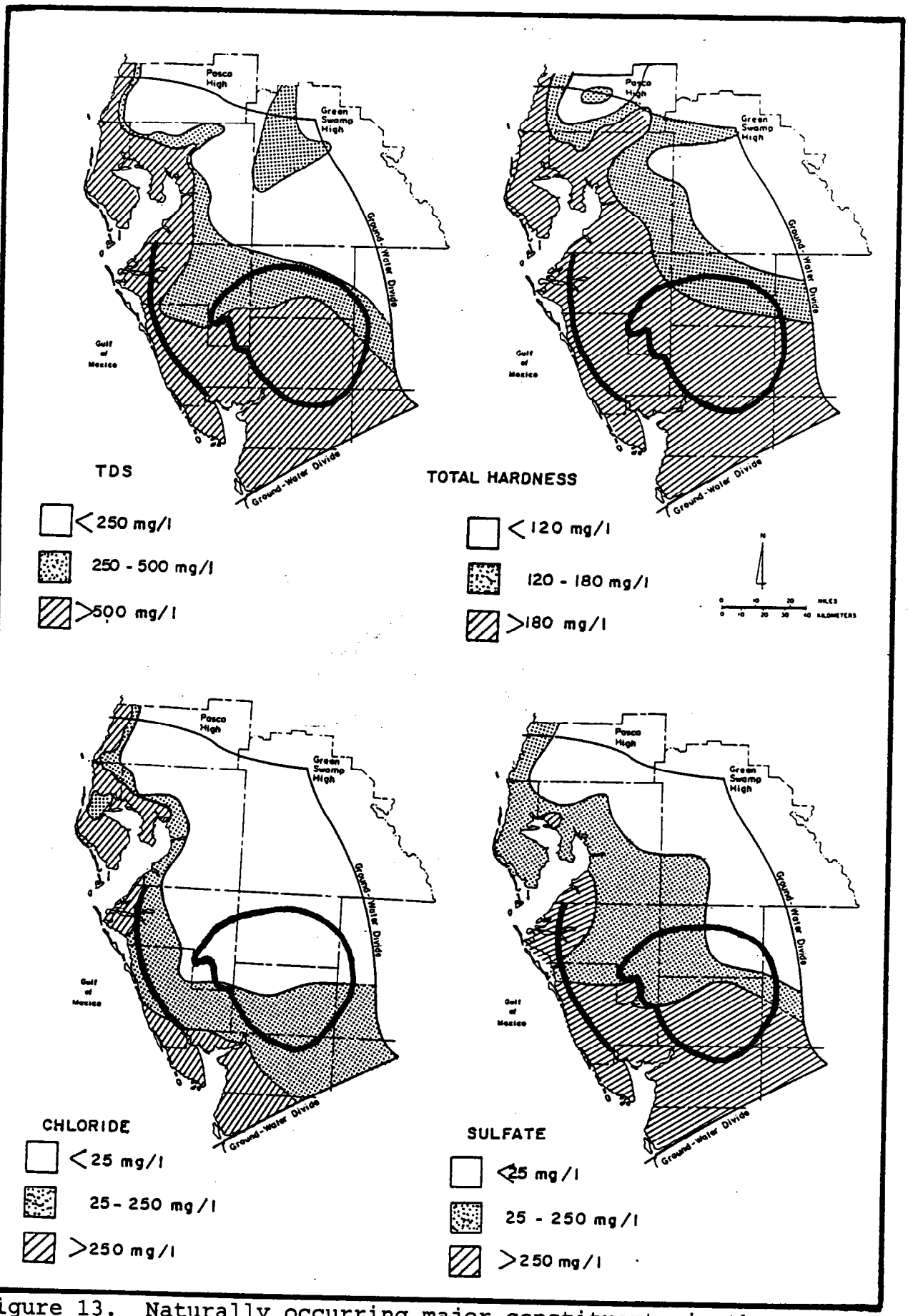

Figure 13. Naturally occurring major constituents in the upper producing intervals of the Upper Floridan aquifer within the Southern West-Central Florida Ground-Water Basin. (Moore and others, 1988)

barrier has greater than 500 mg/l total dissolved solids, greater than 180 mg/l total hardness, chloride ranging from 25 to greater than 250 mg/l, and sulfate ranging from 25 to greater than 250 mg/l. The water quality in the upper Floridan aquifer will be examined in the following section to determine the quality of water required for injection.

3.0 SOURCE WATER AVAILABILITY AND REGULATORY RESTRICTIONS

A critical element to the feasibility of the creation of a saltwater recharge barrier would be the distribution and availability of water for recharge. The water proposed for injection in the barrier system would consist of treated wastewater and storm water. The quantities of wastewater treated in Manatee, Sarasota, and Charlotte Counties was examined to estimate the source water availability. The proposed Floridan aquifer barrier system and water availability were then compared to a successful barrier project in California.

The water for the artificial recharge in the water quality improvement area is proposed to be water from the surficial aquifer. A water balance for the surficial aquifer in the area delimited as the artificial recharge area was calculated to determine if there is sufficient water available for recharge to the Floridan at a rate that could be meaningful in terms of improving the Floridan water quality.

3.1 SOURCE WATER AVAILABILITY

The principal source of water for injection into a barrier project would consist of treated municipal wastewater. The availability of wastewater in the vicinity of the barrier was

first estimated by examining wastewater treatment capacity in Manatee, Sarasota, and Charlotte Counties.

The following tables (Table 1, Table 2, and Table 3) show the capacity of domestic-class wastewater treatment facilities in Manatee, Sarasota, and Charlotte Counties. Only treatment facilities with capacity greater than 1.0 mgd are included in the estimate of water available for injection. Manatee County has 3 plants with capacity greater than 1.0 mgd for a total capacity of 18.4 mgd. Sarasota County has 8 plants with sufficient capacity totalling 27.3 mgd and Charlotte County has 4 plants treating greater than 1.0 mgd for a total of 7.5 mgd. Together the three counties generate 53.2 mgd from treatment facilities with capacity larger than 1.0 mgd on an average basis.

Talbert Barrier Project, California

To estimate the volume of water needed for the injection barrier proposed for southwest Florida, water use was examined in a successful barrier project in the Orange County Water District, Orange County, California (Figure 14). The Talbert aquifer barrier project was designed to prevent seawater from intruding into the Orange County ground-water basin. This basin encompasses approximately 323 square miles and is underlain by an aquifer system which includes the Talbert aquifer.

Table 1. Summary of capacity, number, volume generated, and percent of total for Manatee County's domestic-class wastewater treatment facilities.

Plant Cap (Mgal/day)	No. of Plants	Volume (Mgal/day)	% total volume	No. of plants & primary means of disposal				
				RIB	SWD	SPR	INJ	DF
> 1.0	3	18.40	84.96	2	2	1	1	0
.50 - 1.0	0	00.00	00.00	0	0	0	0	0
.25 - .50	1	00.50	02.30	1	0	0	0	0
.10 - .25	1	00.18	00.83	1	0	0	0	0
.05 - .10	10	00.77	03.55	8	1	1	0	1
.00 - .05	43	01.81	08.35	33	1	6	0	9

Table 2. Summary of capacity, number, volume generated and percent of total for Sarasota County's domestic-class wastewater treatment facilities.

Plant Cap (Mgal/day)	No. of Plants	Volume (Mgal/day)	% total volume	No. of plants & primary means of disposal				
				RIB	SWD	SPR	INJ	DF
> 1.0	8	27.30	75.82	3	6	1	2	0
.50 - 1.0	3	02.45	06.80	2	0	3	0	0
.25 - .50	6	02.54	07.05	4	2	2	0	1
.10 - .25	7	01.28	03.55	7	1	3	0	0
.05 - .10	19	01.42	03.94	18	2	1	0	3
.00 - .05	94	01.02	02.83	53	0	5	0	47

Table 3. Summary of capacity, number, volume generated and percent of total for Charlotte County's domestic-class wastewater treatment facilities.

Plant Cap (Mgal/day)	No. of Plants	Volume (Mgal/day)	% total volume	No. of plants & primary means of disposal				
				RIB	SWD	SPR	INJ	DF
> 1.0	4	7.50	65.90	2	1	3	0	1
.50 - 1.0	0	0.00	00.00	0	0	0	0	0
.25 - .50	1	0.33	02.90	1	0	1	0	0
.10 - .25	5	8.90	08.90	4	0	2	0	1
.05 - .10	10	0.84	07.40	3	0	3	0	4
.00 - .05	93	1.69	14.80	37	0	3	0	59

NOTES:
Codes for each of the primary disposal options are as follows:

RIB = Rapid Infiltration Basin
SWD = Surface Water Discharge
SPR = Sprayfield Irrigation
INJ = Injection Well
DF = Drainfield

SOURCE: Florida Department of Environmental Regulation (FDER) 1987. Ground Water Management System, April 1987. (Moore and others, 1988).

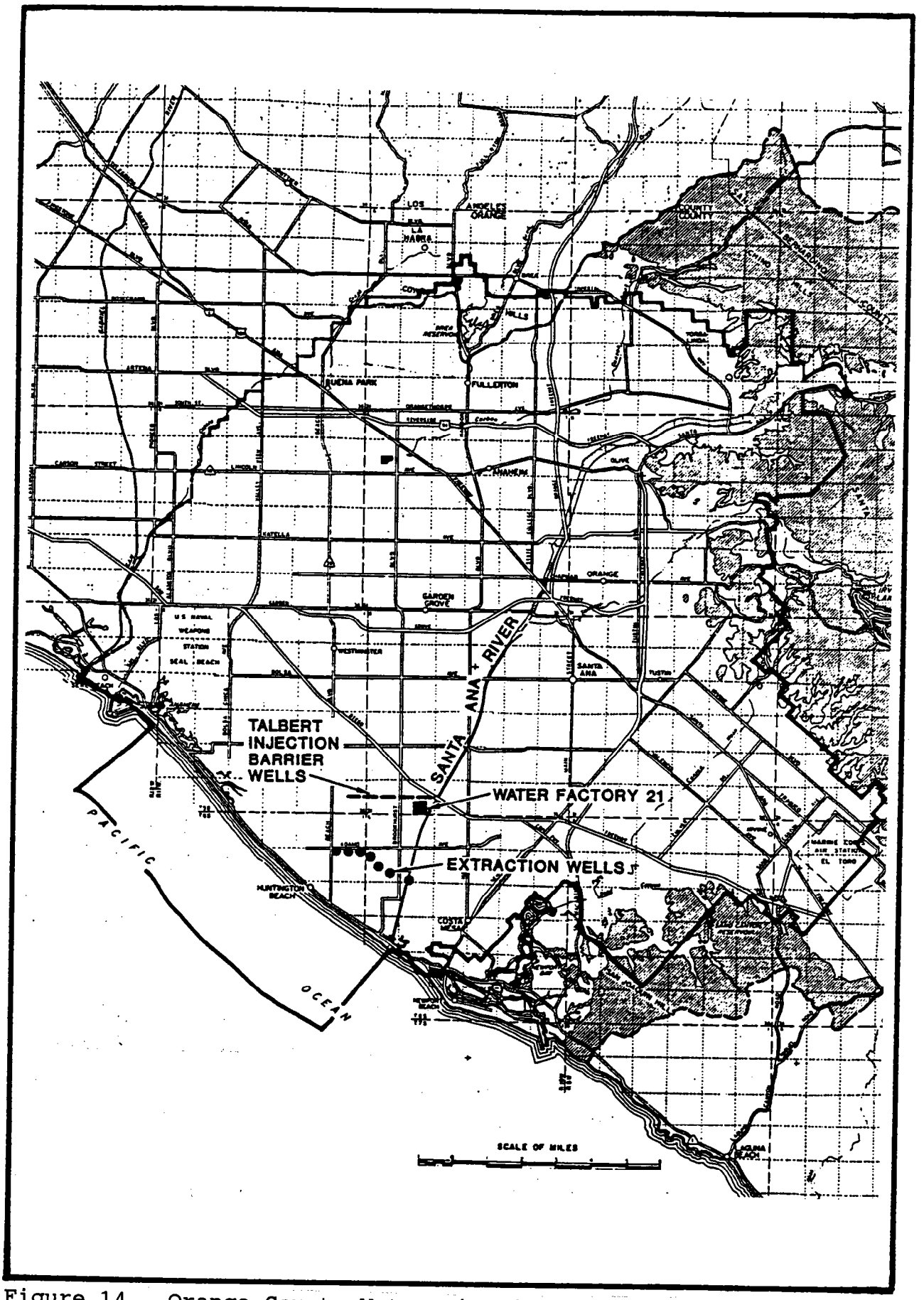

Figure 14. Orange County Water District, Location of Talbert Barrier Facilities. (Orange Co. Water Dist., 1981)

The Talbert aquifer ranges from approximately 50 to 75 feet in thickness. The average hydraulic conductivity in the aquifer is reported to be 134 feet per day (ft/day). The Talbert barrier project prevents seawater from intruding into the Orange County ground-water basin by maintaining a seaward hydraulic gradient in the central part of the basin. The injection barrier is approximately 3 miles in length and is located approximately 3 to 5 miles from the Pacific Ocean coastline.

The water supply for the barrier project is an advanced wastewater treatment plant designed to process approximately 15 mgd of secondary treated wastewater obtained from the County sanitation Districts of Orange County. The State Board of Public Health requires that the treated wastewater be blended with demineralized water or with ground water. Demineralized water is obtained from a 5 mgd reverse osmosis plant and ground water is obtained from wells that produce from a deep aquifer that is not subject to intrusion.

The California Regional Water Quality Control Board and the State Board of Public Health have imposed certain requirements and limitations regarding the quality of the water injected in the barrier project. Table 4 lists some of the limitations. Table 5 summarized the total quantity of water injected each month from July, 1979 through June, 1981. For this two year period, the

TABLE 4

Limitations for Monitoring and Reporting Program No. 71-27

IT IS HEREBY ORDERED that the Orange county Water District shall comply with the following:

A. Discharge Specifications

1. The injection water shall not contain consistent concentrations in excess of the following limits:

Constituent	Limitation	
Electrical Conductivity	900	micromhos
*Ammonium	4.0	mg/l
Sodium	110	"
Total Hardness (as $CaCO_3$)	220	"
Sulfate	125	"
Chloride	120	"
Fluoride	0.8	"
Boron	0.5	"
MBAS	0.5	"
Hexavalent Chromium	0.05	"
Cadmium	0.01	"
Selenium	0.01	"
Phenol	0.001	"
Copper	1.0	"
Lead	0.05	"
Mercury	0.005	"
Arsenic	0.3	"
Iron	0.3	"
Manganese	0.05	"
Barium	1.0	"
Silver	0.05	"
Cyanide	0.2	"
Total Nitrogen	10	"

2. The injection water shall not have a pH of less than 6.5 nor greater then 8.0.

3. The injection water shall not cause taste, odors, foam, or color in the ground waters.

*Interim limitation authorized 11/4/77

(Orange Co. Water Dist., 1981)

TABLE 5

Monthly Injection Rates
(Quantities in acre-feet)

	Month	Reclaimed Wastewater	Demineralized Wastewater	Deep Well Water	Total
1979	Jul	73.5	296.1	375.6	745.2
	Aug	369.5	282.2	266.2	917.9
	Sep	742.0	361.7	377.6	1,481.3
	Oct	685.1	407.9	428.9	1,521.9
	Nov	525.8	415.9	277.9	1,219.6
	Dec	379.9	402.2	299.4	1,081.5
1980	Jan	43.1	282.8	55.7	381.6
	Feb	20.9	445.2	353.7	819.8
	Mar	83.0	400.6	547.6	1,031.2
	Apr	19.2	183.0	386.7	588.9
	May	55.3	233.8	248.9	538.0
	Jun	80.8	385.5	228.6	694.9
		3,078.1	4,096.9	3,846.8	11,021.8
	Jul	79.8	414.9	243.5	738.2
	Aug	84.0	398.2	278.7	760.9
	Sep	242.4	1,215.9	787.6	2,245.9
	Oct	86.1	377.5	271.8	735.4
	Nov	83.9	372.9	266.2	723.0
	Dec	33.8	127.2	253.4	414.4
1981	Jan	45.9	95.6	125.7	267.2
	Feb	76.8	297.3	413.7	787.8
	Mar	125.9	306.7	682.2	1,114.8
	Apr	24.6	397.0	489.8	911.4
	May	0	297.5	430.4	727.9
	Jun	0	119.4	200.0	319.4
		883.2	4,420.1	4,443.0	9,746.3
Total		3,961. 3	8,517.0	8,289.8	20,768.1

(Orange Co. Water Dist., 1981)

average annual injection rate was approximately 9.3 mgd. Figure 15 shows the chloride concentration in the Talbert aquifer in June, 1981 as a result of the barrier project operation. Figure 16 shows the September 1979 potentiometric levels in the Talbert aquifer in the vicinity of the barrier. This map shows water levels below sea level on both sides of the barrier.

Southwest Florida Barrier Proposal

To compare water use in the proposed southwest Florida barrier to that reported for the Talbert barrier project, we have examined the similarities and differences between the hydraulic framework of the Talbert aquifer and that of the Floridan aquifer. The hydraulic conductivity of the two aquifers is approximately the same, however the thickness of the Floridan aquifer is approximately 20 times that of the Talbert aquifer. Because the volume of water required for injection to retard salt water intrusion is proportional to the square of the aquifer thickness, much more water would be required to create a barrier in the thicker Floridan aquifer.

A second difference between the two aquifer frameworks is the existing hydraulic head in the aquifers at the location of the barrier. Although a landward gradient exits in the potentiometric level of the Talbert aquifer, a strong seaward gradient is present in the potentiometric level in the Floridan in most of the area proposed for the Florida barrier.

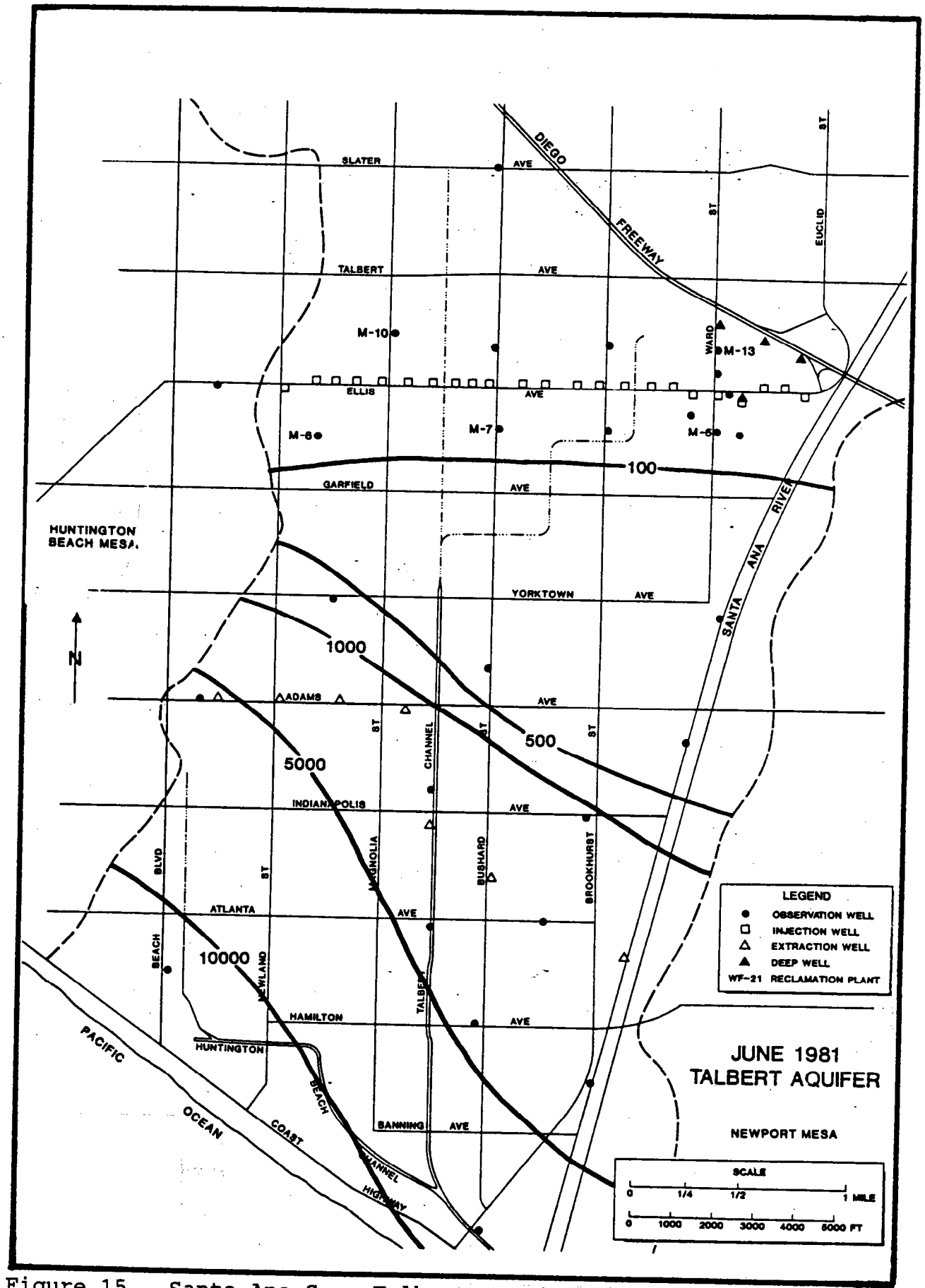

Figure 15. Santa Ana Gap, Talbert Barrier Isochlors, Lines of Equal Chloride Ion Concentration Mg/l. (Orange Co. Water Dist., 1981)

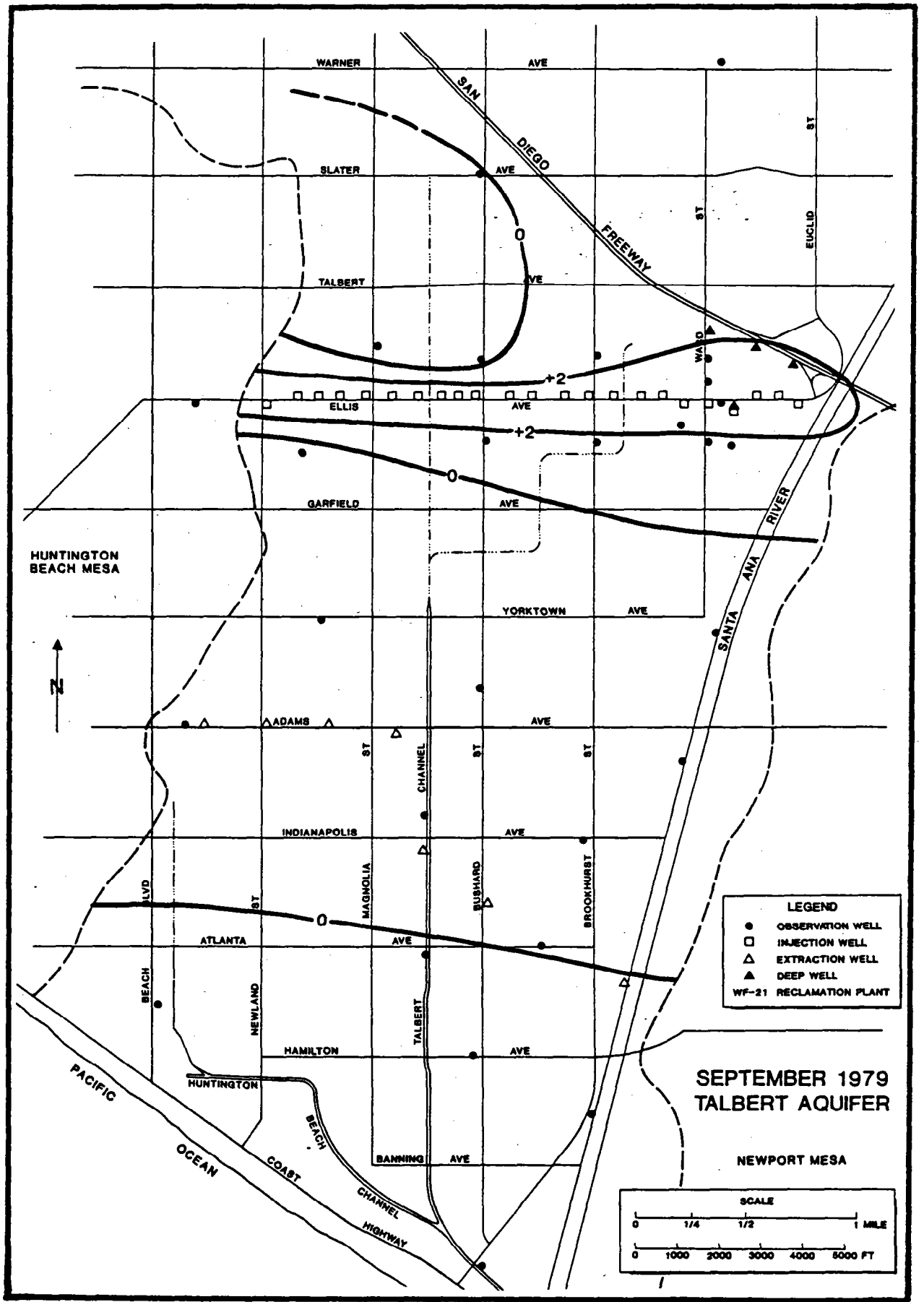

Figure 16. Santa Ana Gap, Talbert Barrier Water Level Contours, Lines of Equal Piezometric Elevation. (Orange Co. Water Dist., 1981)

Finally, the proposed barrier in Manatee, Sarasota, and Charlotte Counties is approximately 75 miles in length and the Talbert barrier project is only 3 miles in length. The scope of the proposed barrier in southwest Florida is many times larger than the Talbert barrier.

If all of the 53.2 mgd generated in the large capacity wastewater treatment facilities in Manatee, Sarasota, and Charlotte Counties could be made available to a barrier system, and if the same ratio of treated wastewater to other water sources were used in Florida as in the Talbert project, then approximately 150 mgd would be available for the proposed barrier system. The Talbert barrier uses an average of approximately 3 mgd per mile of barrier. If the proposed Floridan barrier system could be constructed using 3 mgd per mile of barrier, then 150 mgd could only supply approximately 50 miles of barrier. This very simple assessment does not address the source of the additional 100 mgd of water to be added to the treated municipal wastewater to total 150 mgd.

The numbers used in this simple assessment are generous in terms of the volumes of water available to be applied to the proposed barrier system. Even using the generous estimates, the water available for injection would not be sufficient to create a barrier using the same rates used in the California barrier

project. The proposed Floridan aquifer barrier project would require much larger rates of injection due principally to the larger thickness of the aquifer.

3.2 REGULATORY RESTRICTIONS

The most important regulatory restrictions to creating a saltwater intrusion barrier would be restrictions to the quality of the injected water. The Florida Department of Environmental Regulation (FDER) is the regulatory agency having primary responsibility for regulation of the quality of water injected into the proposed barrier. FDER is currently rewriting Chapter 17-6, and Chapter 17-610, Florida Administrative Code (FAC), the rules for reuse of reclaimed water. The September 7, 1988 workshop draft of the proposed rules revision is attached to this report as Appendix 1. Because injection of treated wastewater into a barrier system would fall under these rules, the proposed rules were examined to determine the level of treatment needed for the injected water. Section 17-6.060 (1) (a) 4 lists the Technology-Based Effluent Limitations (TBELs) for "Ground-water disposal via underground injection". Depending on the classification of the receiving ground water, the TBELs are either secondary treatment (if the receiving ground water is Class G-IV) or beyond secondary treatment (if the receiving groundwater is Class G-II). Section 17-6.060 (1) (b) lists "Additional Levels of Treatment" required, Section 17-6.060 (2)

criteria, and Section 17-6.060 (3) (b) lists "Water Quality Based Effluent Limitations" (WQBELs) for groundwater discharge. Section 17-6.080 (4) lists added restrictions based on the classification of the injection wells and the classification of the receiving water.

The level of water quality restrictions applicable to the proposed saltwater barrier project would depend upon the classification of the receiving water based on Section 17-3.403 FAC. Figure 17 shows the total dissolved solids concentration in the upper Floridan aquifer. All of Manatee County and most of Sarasota County are shown as having water with dissolved solids less than 5000 mg/l. These waters would be classified as Class G-II waters because they have less than 10,000 mg/l solids. Part of southern Sarasota County along the coast and all of Charlotte County along the coast are shown as having greater than 5,000 mg/l dissolved solids. If any of this area were shown to have greater than 10,000 mg/l dissolved solids, this water would be classified Class G-IV and the lesser water quality restrictions would apply.

3.3 WATER BALANCE

A second part of the proposal being examined in this study is the feasibility of improving water quality behind the saltwater intrusion barrier by creating an artificial recharge area in

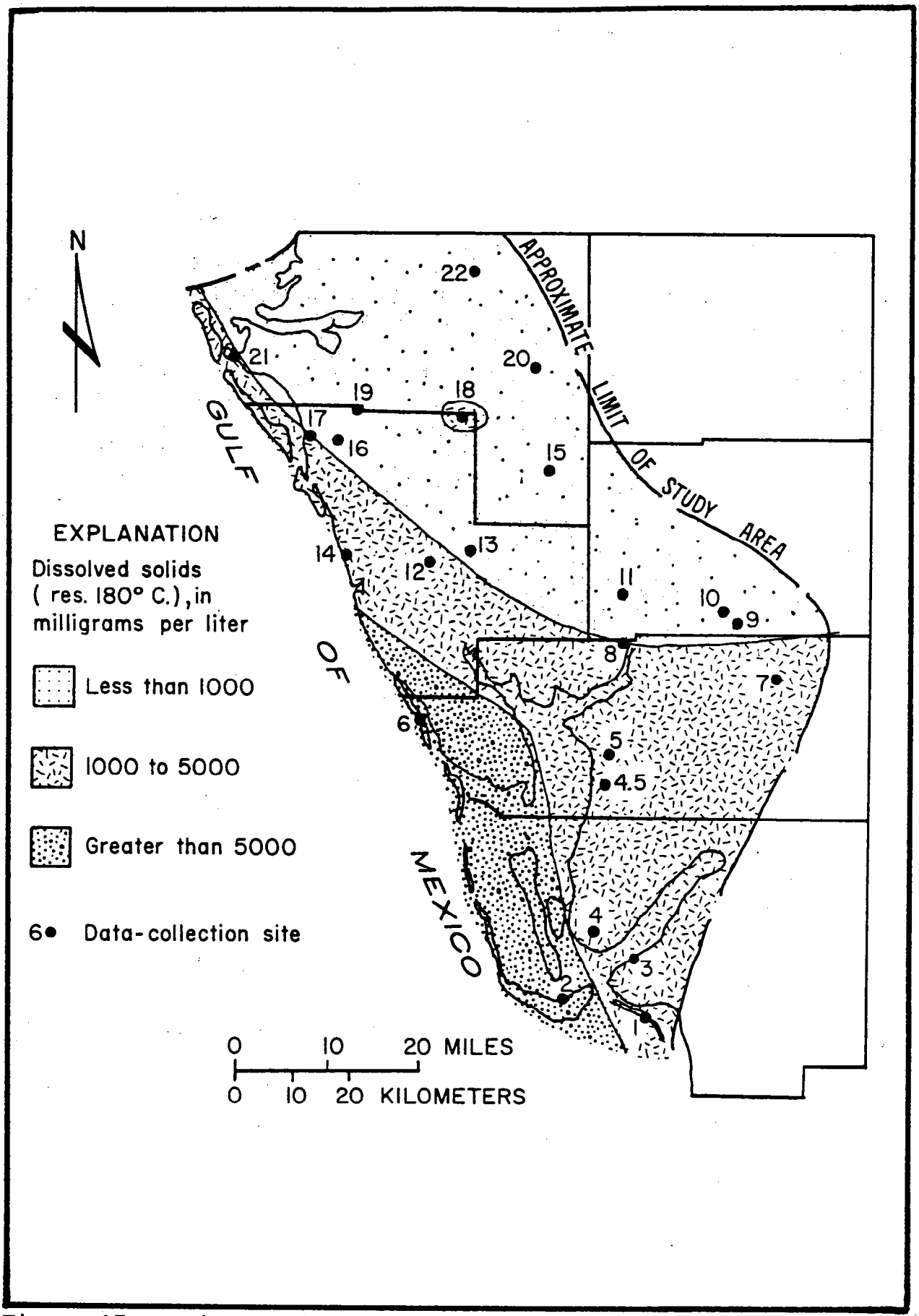

Figure 17. Estimated distribution of dissolved solids (residue at 180°C) in the upper part of the Florida aquifer, July-November 1980 (Steinkampf, 1982).

southern Hardee and Desoto Counties. Recharge to the Floridan aquifer would be increased in this area by constructing a network of connector wells between the surficial and the Floridan aquifer systems. The feasibility of this network has already been examined in Section 3.1 above based on the hydraulic head differences between the water table in the surficial aquifer and the potentiometric level in the Floridan aquifer.

A water balance was calculated for the artificial recharge area to determine if any excess water is available in the surficial aquifer to be recharged to the Floridan aquifer. The elements included in the water balance are:

1) Inputs: rainfall, pumpage return, and ground-water inflow; and 2) Outputs: evapotranspiration, stream flow, pumpage, and ground-water outflow.

To simplify this water balance two assumptions were made: 1) ground-water inflow is assumed to be equal to ground-water outflow, and 2) pumpage return is assumed to be half of pumpage. The first assumption concerning ground-water inflow and outflow is probably reasonable and the second assumption concerning the volume of pumpage returned as agricultural return is probably conservative, that is the pumpage return is probably less than half of pumpage.

Input Values

The precipitation values used for this balance are the values reported for Hardee and Desoto Counties in the Hardee and Desoto County Ground-water Resource Availability Inventory (GWRAI), (Moore, and others, 1988a and b). Average rainfall for the two counties is 52.8 inches per year. Pumpage return is assumed to be equal to half of pumpage (half of 2.2 inches per year = 1.1 inches per year) and ground-water inflow is assumed to be equal to ground-water outflow, so both inflow and outflow are neglected.

Output Values

Evapotranspiration is estimated to be 41.2 inches per year (Hutchinson, 1977) and stream flow is estimated to be 11.03 inches per year, a weighted average of all discharge reported for the two counties, (USGS, 1986). The estimates for ground-water pumpage are values reported in the Hardee and Desoto Counties' GWBRAI (Moore, and others, 1988), 75 mgd for Hardee County and 67 mgd for Desoto County or a total of 2.2 inches per year. The final output to the balance is ground-water outflow which is assumed to be equal to ground-water inflow.

The water balance for the area is thus:

Rainfall + Pumpage Return	(inputs)
- Evapotranspiration - Stream flow - Pumpage	(outputs)
= Change in Storage.	
52.8 + 1.1 - 41.2 - 11.03 - 2.2 = -0.53	(inches per year)

The solution to this balance is a negative change or loss of storage of 0.53 inches per year. This water balance indicates that based on the above estimates for the water balance elements, approximately one half inch of storage is being lost per year. The balance thus indicates that there is no excess water available to be recharged to the Floridan from the surficial aquifer. Water recharged to the Floridan aquifer through a connector well network would be obtained from capture of evapotranspiration or stream flow.

If the connector well network were constructed, evapotranspiration would decrease due to the lowering of the water table, and some of the surficial aquifer water now discharged to stream flow would be captured and recharged to the Floridan aquifer. The capture of water lost to evapotranspiration may not cause significant problems in Hardee and Desoto Counties but the capture of stream flow could cause real problems to surface water users downstream in Sarasota and Charlotte Counties.

4.0 NUMERICAL MODELING

A preliminary numerical model was developed to investigate the feasibility of the recharge project. The model is a quasi-three-dimensional, steady-state, flow model designed to investigate the injection. The model used for this study is a modification of a model developed by Bengtsson, 1987 to simulated ground-water flow in the entire Southwest Florida Water Management District. For this evaluation, the southern half of the already calibrated district model was subdivided into smaller nodes and was then used to simulate the hydraulics of the proposed injection barrier.

Aquifer characteristics and hydraulic head relationships as developed in the calibrated district model were included in the simulation. The response of the aquifer was simulated based on a simplified spacing geometry of injection wells and the injection rate based on the above estimate of water available for injection described in section 3.1 above.

4.1 MODEL RESULTS

The results of the simulation of a saltwater barrier in the southern part of the District are shown in Figure 18 and 19. This is a map of the mounding in the potentiometric surface of

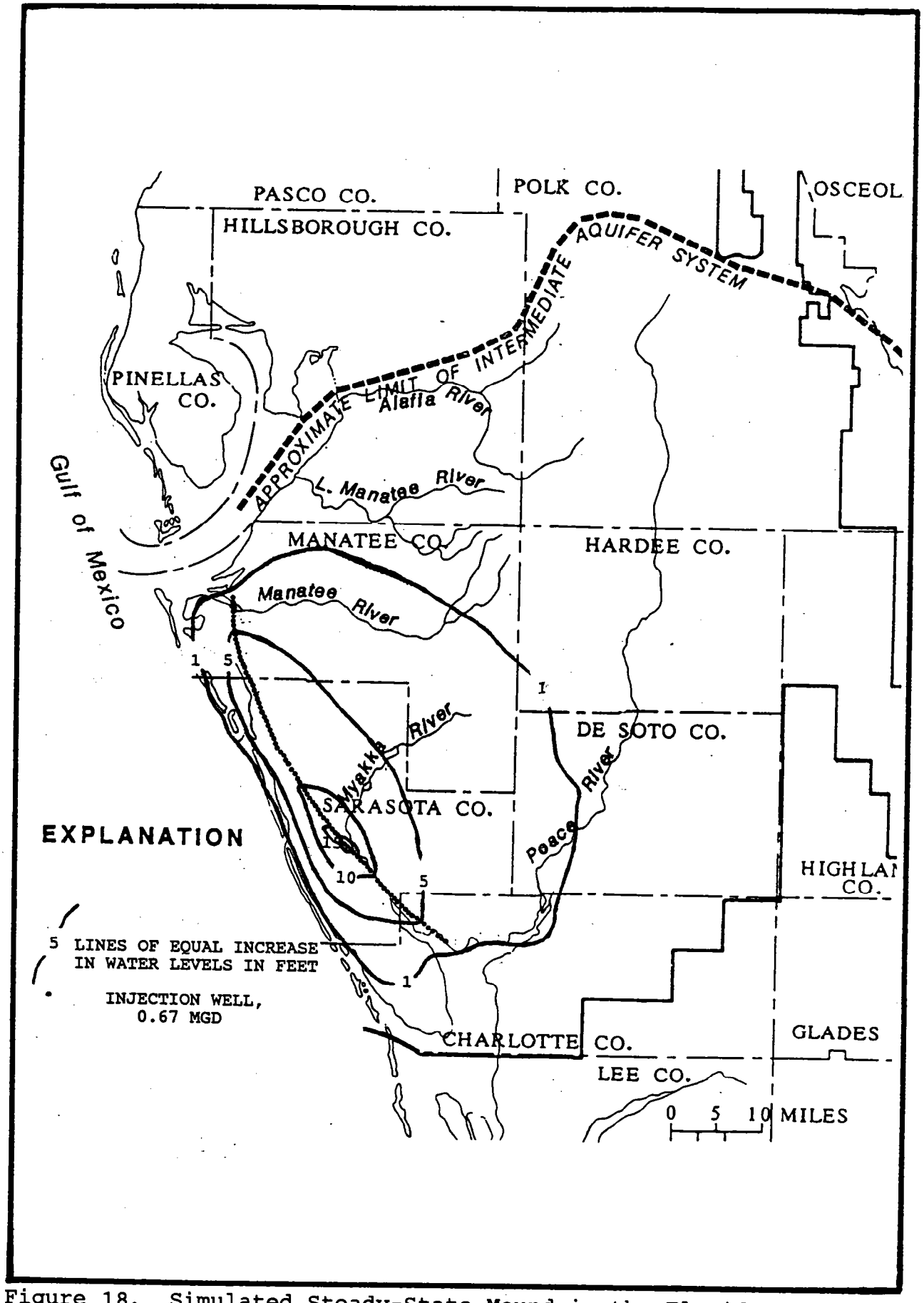

Figure 18. Simulated Steady-State Mound in the Floridan Aquifer System from 50 mgd Injection.

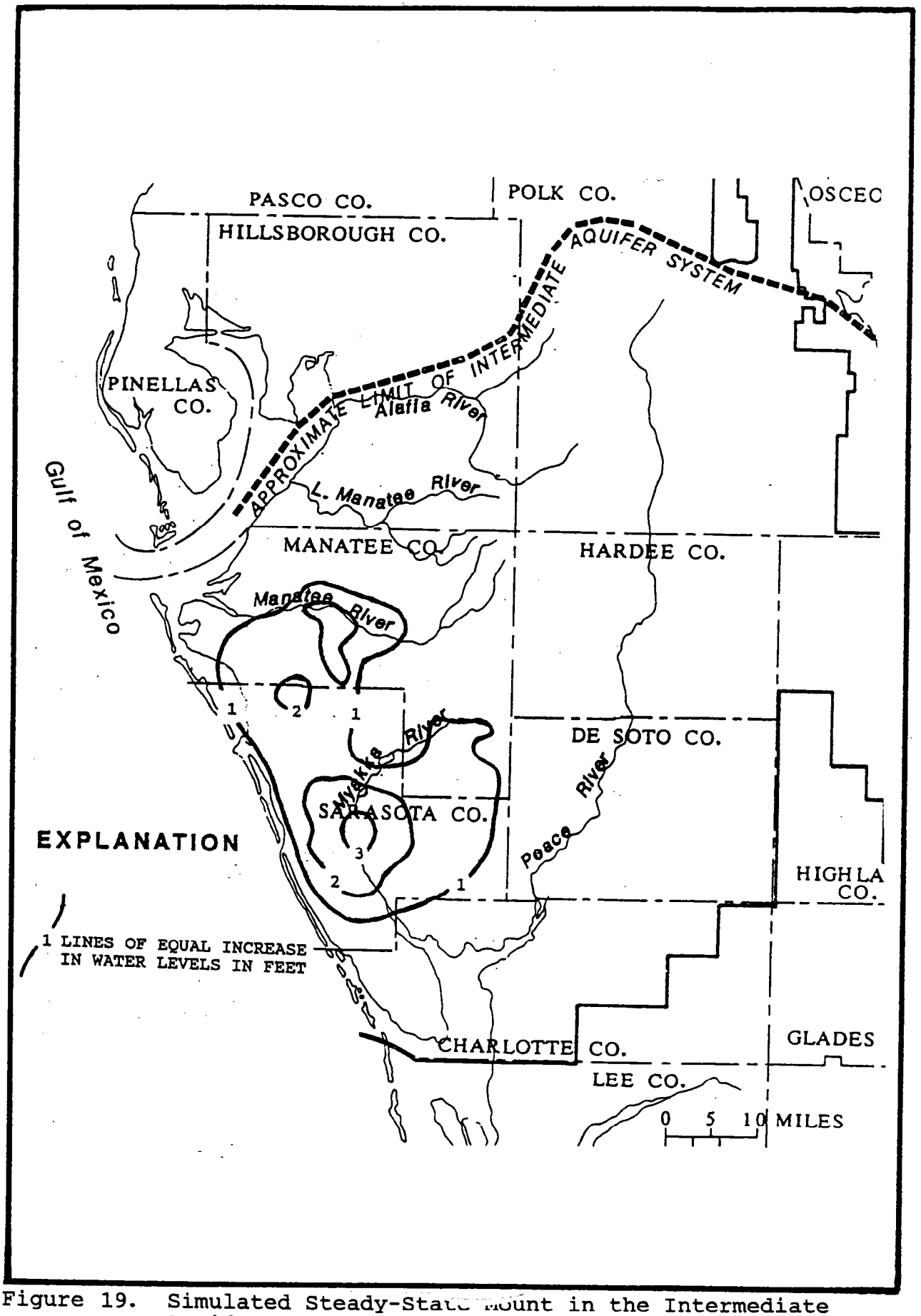

Figure 19. Simulated Steady-State Mount in the Intermediate Aquifer System from 50 mgd Injection.

the Floridan and intermediate aquifer systems due to injection of 1.34 mgd of water per mile of barrier. The injected amount represents the source water estimate from Section 3.1 above. The simulation is steady state assuming injection at a constant rate of 0.67 mgd into each well, with the wells spaced one half mile apart, one well per model node.

The map shows a mound developing along the coast in both the Floridan and intermediate aquifer systems, with the maximum build-up approximately in the center of the barrier. This simulation indicates that the injection rate of 0.67 mgd per well or 1.34 mgd per mile, (a generous but reasonable rate) will create a significant mound in the potentiometric surface. Due to the extreme thickness of the Floridan aquifer, the mound may not significantly move the toe of the saltwater intrusion zone.

5.0 RECOMMENDATIONS

This examination of the hydrogeologic framework in the proposed project area, the source water availability, regulatory requirements, and the preliminary numerical model shows that the proposed saltwater barrier project is not feasible for 75 miles of Floridan aquifer along the coast of the southwest part of the District. It is recommended that smaller segments of a saltwater barrier may be appropriate, most likely in the intermediate aquifer in parts of the area that are heavily pumped for public supply. A smaller scale barrier, similar in scope to the successful project in California, may be appropriate because the portions of the coast line that are the most populous and thus have the highest water demand, are also the portions that would have the largest and most proximal source of wastewater.

Smaller scale feasibility projects should be developed in detail, and should use solute transport modeling with very fine model grid spacing.

REFERENCES

Bengtsson, Terrance, 1987, District Resource Management Department, Development and Documentation of a Transient, Quasi-Three-Dimensional, Finite-Difference Model of the Tri-County Well-field Area.

Brown, David P., 1983, Water Resources of Manatee County, Florida, U. S. Geological Survey, Water Resources Investigations 8-74.

Duerr, A. D., Hunn, J. D., Lewelling, B. R., and Trommer, J. T., Geohydrology and 1985 Water Withdrawals of the Aquifer Systems in Southwest Florida, with Emphasis on the Intermediate Aquifer System, U.S. Geological Survey, Water-Resources Investigations Report 87-4259.

Duerr, A. D. and Wolansky, R. M., 1986, Hydrogeology of the Surficial and Intermediate Aquifers of Central Sarasota County, Florida, U.S. Geological Survey, Water-Resources Investigations Report 86-4068.

Hutchinson, C. B., 1978, Appraisal of Shallow Ground-Water Resources and Management Alternatives in the Upper Peace and Eastern Alafia River Basins, Florida, U.S. Geological Survey, Water-Resources Investigations 77-124.

Kimrey, Joel O. and Fayard, Larry D., 1984, Geohydrologic Reconnaissance of Drainage Wells in Florida, U.S. Geological Survey, Water-Resources Investigations Report 84-4021.

Miller, Robert A., 1985, Percentage Entrainment of Constituent Loads in Urban Runoff, South Florida, U.S. Geological Survey, Water-Resources Investigations Report 84-4329.

Moore and others, 1988a, b, c, d, e. District Resource Management and Planning Departments, Ground-Water Resource Availability Inventories for: Charlotte, DeSoto, Hardee, Manatee, and Sarasota.

Steinkampf, W. C., 1982, Origins and Distribution of Saline Ground Waters in the Floridan Aquifer in Coastal Southwest Florida, U. S. Geological Survey, Water-Resource Investigations 82-4052

Sutcliffe, H. Jr., 1975, Appraisal of the Water Resources of Charlotte County, Florida, Report of investigations No. 78.

U.S. Geological Survey, 1974, Evaluation of a Proposed Connector Well, Northeastern DeSoto County, Florida, Water Resources Investigation 5-74.

Wilson, William E., 1977, Ground-Water Resources of DeSoto and Hardee Counties, Florida.

Wolansky, Richard M., 1983, Hydrogeology of the Sarasota-Port Charlotte Area, Florida, U.S. Geological Survey, Water-Resources Investigations Report 82-4089.

Wolansky, R. M., Barr, G. L., and Spechler R. M., 1979, Generalized Configuration of the Floridan Aquifer, Southwest Florida Water Management District, U. S. Geological Survey, Water-Resources Investigations Open-File Report 79-1490.

Appendix 1

September 8, 1988 - Workshop Draft

17-6

17-610

Florida Administrative Code

Rules for Reuse of Reclaimed Water

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee

To: _____ Location: _____

To: _____ Location: _____

To: _____ Location: _____

From: _____ Date: _____

Interoffice Memorandum

TO: Interested Parties

FROM: David W. York, Ph.D., P.E., Administrator
Domestic Waste Section

DATE: September 7, 1988

SUBJECT: Technical Advisory Committee Meeting No. 6
and Public Workshop
Rules for Reuse of Reclaimed Water

A public workshop on proposed revisions to Chapter 17-6, Florida Administrative Code (FAC), and on proposed text for Chapter 17-610, FAC, will be held in conjunction with the sixth meeting of the Technical Advisory Committee (TAC) on September 20, 1988 at the Water Conserv II Water Reclamation Facility in Orlando. The meeting and workshop will begin at 1:00 p.m. The following materials are attached for your information:

1. Agenda for the September 20 TAC meeting and public workshop.
2. Map showing the location of the Water Conserv II Water Reclamation Facility in Orlando.
3. Workshop Draft of Chapter 17-6, FAC.
4. Workshop Draft of Chapter 17-610, FAC.

I look forward to seeing you on September 20.

DWY/lp

Attachments

cc: Howard L. Rhodes
Richard Harvey

RULES

OF THE

DEPARTMENT OF ENVIRONMENTAL REGULATION

CHAPTER 17-6

WASTEWATER FACILITIES

17-6.030 Definitions.
17-6.040 General Technical Guidance.
17-6.060 Reclaimed Water or Effluent Limitations.
17-6.080 Reuse and Effluent Disposal
17-6.110 Treatment Plants, Reuse Systems, and Effluent Disposal Systems
17-6.180 Enforcement.
17-6.401 Discharge Permitting Requirements

PART I

DOMESTIC WASTEWATER FACILITIES

Subpart A General

17-6.010 THROUGH 17-6.020 - No change.

17-6.030 DEFINITIONS

17-6.030(1) THROUGH (8) - No change.

(9) "Average rainfall year" means a year in which the amount of precipitation is equal to the mean annual precipitation that has occurred for an antecedent period of not less than 10 years.

17-6.030 (9) THROUGH (25) RENUMBERED AS 17-6.030(10) THROUGH (26)

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(27) "Emergency discharge" means a discharge that results from a genuine emergency that could not be anticipated or avoided. Such situations require reporting to the department but do not require a water quality-based effluent limitation. An alternate discharge as discussed in Rule 17-6.401(3), F.A.C., is not an emergency discharge.

17-6.030(26) THROUGH (66) RENUMBERED AS 17-6.030(28) THROUGH (68)

(69)~~67~~ "Reclaimed water" means water that has received at least secondary treatment and is reused after flowing out of any plant or other works used for the purpose of treating, stabilizing or holding wastes.

17-6.030(68) THROUGH (70) RENUMBERED AS 17-6.030 (70) THROUGH (72)

(73) "Reuse" means the deliberate application of reclaimed water, in compliance with Department rules, for a beneficial purpose.

(a) Where appropriate, said uses may encompass:

1. Landscape irrigation (such as irrigation of golf courses, cemeteries, highway medians, parks, playgrounds, school yards, retail nurseries, and residential properties);

2. Agricultural irrigation (such as irrigation of food, fiber, fodder and seed crops, wholesale nurseries, sod farms, and pastures);

3. Aesthetic uses (such as decorative ponds and fountains);

4. Groundwater recharge (such as slow-rate, rapid-rate, and absorption field land application systems) but not including disposal methods described in Rule 17-6.030(73)(b);

5. Industrial uses (such as cooling water, process water, and wash waters);

6. Wetlands utilization (such as the use of existing or man-made treatment or receiving wetlands);

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

7. Environmental enhancement resulting from discharge of reclaimed water having received at least advanced wastewater treatment;

8. Fire protection; or

9. Other useful purpose.

(b) Overland flow land application systems, rapid-rate land application systems providing continuous loading to a single percolation cell, other land application systems involving less than secondary treatment prior to application, septic tanks, and groundwater disposal systems using Class I wells injecting effluent or wastes into Class G-IV waters shall be excluded from the definition of reuse.

17-6.030(71) THROUGH (106) RENUMBERED AS 17-6.030(74) THROUGH (109)

(110)~~(102)~~ "Water quality standards" means standards ~~are~~ comprised of designated most beneficial uses (classification of waters), the numerical and narrative criteria applied to the specific water use or classification, the Florida anti-degradation policy, ~~of Outstanding Florida Waters~~ and the moderating provisions contained in Chapters 17-3 and 17-4 of the Florida Administrative Code.

17-6.030(108) THROUGH (110) RENUMBERED AS 17-6.030(111) THROUGH (113)

Specific Authority: 403.061, 403.087, F.S.

Law Implemented: 403.021, 403.061, 403.062, 403.085, 403.086, 403.087, 403.088, F.S.

History: New 1-1-82, Amended 5-31-82, 3-31-83, 1-29-84, 4-27-86, 8-4-86,_____.

Subpart B Design/Performance Considerations

17-6.040 General Technical Guidance.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(1) The technical standards and criteria contained in the following standard manuals and technical publications listed in (4) below and those referenced throughout this chapter are hereby incorporated by reference and may be applied, if applicable, in determining whether permits to construct or modify domestic wastewater facilities shall be issued or denied. Rule 17-610, F.A.C., shall be applied to reuse of reclaimed water systems and to land application projects. ~~However, the standards and criteria adopted by Subsection (4)(q) shall be followed for land application systems.~~

(2) Deviations from the standards and criteria contained in the publications listed in (4) below may be approved by the department provided that:

(a) The engineer's report provides reasonable assurance that the proposed design will provide collection, transmission, treatment and disposal meeting the requirements of this rule; and either

(b) conforming with these standards cannot be done except at unreasonably higher costs; or

(c) it is not technically feasible to conform to these standards because of site conditions or incompatibility with a proposed facility design employing new and innovative techniques which assure compliance with the remainder of this chapter.

(3) The department may require deviation from the standards and criteria contained in the publications listed in (4) below upon a finding that conformance to them will not assure compliance with the remainder of this chapter or other rules of the department.

(4) Standard Manuals and Publications

(a) Water Pollution Control Federation, 1977. Manual of Practice No. 8. Wastewater Treatment Plant Design. W.P.C.F., 2626 Pennsylvania Avenue, N.W., Washington, D.C. 20037.

(b) Water Pollution Control Federation, 1970 (fourth printing). Manual of Practice No. 9. Design and Construction of Sanitary and Storm Sewers. W.P.C.F.; 2626 Pennsylvania Avenue, N.W., Washington, D.C. 20037.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(c) Great Lakes/Upper Mississippi River Board of State Sanitary Engineers, 1978 edition. Recommended Standards for Sewage Works. Health Education Service, Inc., P. O. Box 7283, Albany, New York 12224.

(d) U. S. Environmental Protection Agency, 1987~~1976~~. Phosphorus Removal-~~Process~~ Design Manual. Environmental Research Information Center, Technology Transfer, U. S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

(e) U. S. Environmental Protection Agency, 1973. Carbon Absorption-Process Design Manual. Environmental Research Information Center, Technology Transfer, U. S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

(f) U. S. Environmental Protection Agency, 1975. Suspended Solids Removal-Process Design Manual. Environmental Research Information Center, Technology Transfer, U. S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

(g) U. S. Environmental Protection Agency, 1974. Upgrading Existing Wastewater Treatment Plants-Process Design Manual: Environmental Research Information Center, Technology Transfer, U. S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

(h) U. S. Environmental Protection Agency, 1974. Sulfide Control in Sanitary Sewerage Systems-Process Design Manual. Environmental Research Information Center, Technology Transfer, U. S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

(i) U. S. Environmental Protection Agency, 1975. Nitrogen Control-Process Design Manual. Environmental Research Information Center, Technology Transfer, U. S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

(j) U. S. Environmental Protection Agency, 1981. Land Treatment of Municipal Wastewater-Process Design Manual. Environmental Research Information Center, Technology Transfer, U.S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(k) U. S. Environmental Protection Agency, 1977. Wastewater Treatment Facilities for Sewered Small Municipalities-Process Design Manual. Environmental Research Information Center, Technology Transfer, U. S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

(l) U. S. Environmental Protection Agency, 1979. Sludge Treatment and Disposal-Process Design Manual. Environmental Research Information Center, Technology Transfer, U. S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

(m) U. S. Environmental Protection Agency, 1974. Design Criteria for Mechanical, Electric, and Fluid System and Component Reliability-MCD-05. General Services Administration, Centralized Mailing Lists Services, Bldg. 41, Denver Federal Center, Denver, Colorado 80225.

(n) U. S. Environmental Protection Agency, 1974. Protection of Shellfish Waters-MCD-06. General Services Administration, Centralized Mailing Lists Services, Bldg. 41, Denver Federal Center, Denver, Colorado 80225.

(o) U.S. Environmental Protection Agency, 1977. Procedures Manual for Groundwater Monitoring at Solid Waste Disposal Facilities. Solid Waste Information, U.S. Environmental Protection Agency, Cincinnati, Ohio 45268.

(p) U. S. Environmental Protection Agency, 1980. Design Manual-Onsite Wastewater Treatment and Disposal Systems. Environmental Research Information Center, Technology Transfer, U.S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

~~(q) Florida Department of Environmental Regulation, 1983. Land Application of Domestic Wastewater Effluent in Florida. Office of Public Information, 2600 Blair Stone Road, Tallahassee, Florida 32301.~~

(q)~~(r)~~ U. S. Department of Agriculture, Soil Conservation Service, 1973. Drainage of Agricultural Land. Water Information Center, Inc., 6800 Jericho Turnpike, Syosset, New York 11791.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(r)~~(s)~~ Florida Department of Transporation, 1979. Land Use, Cover, and Forms Classification System-A Technical Manual. FDER Office of Public Information, 2600 Blair Stone Road, Tallahassee, Florida 32301.

(s)~~(t)~~ U. S. Environmental Protection Agency, 1976. Direct Environmental Factors at Municipal Wastewater Works-MCD-20. General Services Administration, Centralized Mailing Lists Services, Bldg. 41, Denver Federal Center, Denver, Colorado 80225.

(t) U.S. Environmental Protection Agency. 1984. Land Treatment of Municipal Wastewater - Supplement on Rapid Infiltration and Over land Flow - Process Design Manual. Environmental Research Information Center, U.S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

(u) U.S. Environmental Protection Agency. 1986. Municipal Wastewater Disinfection - Design Manual. Environmental Research Information Center, U.S. Environmental Protection Agency, 26 West St. Clair, Cincinnati, Ohio 45268.

(5) Members of the public may request and obtain copies of the publications listed in (4) above by contacting the appropriate publisher at the address indicated. Copies of the above publications are on file with the Florida Secretary of State and the Joint Administrative Procedures Committee. Copies are also on file and available for review in the department's Tallahassee offices (including the Office of Public Information) and in the department's district, subdistrict, and branch offices where they may be reviewed during normal business hours.

Specific Authority: 403.061(7), F.S.

Law Implemented: 403.061, 403.085, 403.086, 403.087, 403.088, F.S.

History: New 6-24-80, Formerly 17-6.30, Renumbered and Amended 1-1-82, Amended 5-31-82, 1-29-84, _____.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

17-6.41 THROUGH 17-6.055 - No change.

17-6.060 Reclaimed Water or Effluent Limitations.

The waste treatment standards contained in this section generally shall be met before discharge into holding ponds (if applicable), reuse systems, disposal systems, or surface waters classified pursuant to Chapter 17-3, FAC. Waste treatment, at a minimum, shall consist of secondary treatment and, to the extent necessary, disinfection and pH control. Additional levels of treatment (beyond secondary) may be required pursuant to provisions contained in this section, ~~as well as~~ in Section 17-6.080, or in Rule 17-610, F.A.C. These design/performance standards shall be enforceable pursuant to the operational compliance criteria in Section 17-6.180. General technical guidance is provided by references listed under Section 17-6.040. Discharges which would not result, at a minimum, in the protection of surface and ground water quality criteria shall not be allowed. Effluent or reclaimed water limitations shall be achieved at the appropriate locations specified pursuant to both this section and Section 17-6.080.

(1) Technology-Based Effluent Limitations (TBELs).

(a) Secondary Treatment

1. Surface water disposal (excluding ocean outfalls)

All domestic wastewater facilities are required, at a minimum, to provide secondary treatment of wastewater. New facilities and modifications of existing facilities shall be designed to achieve an effluent after disinfection containing not more than 20 mg/l BOD and 20 mg/l TSS, or 90% removal of each of these pollutants from the wastewater influent, whichever is more stringent. All facilities shall be operated to achieve, at a minimum, the specified effluent limitations (20 mg/l). All facilities, whether new or existing, shall be subject to provisions of Section 17-6.010(5), regarding the applicability of the above requirements.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

and Section 17-6.160, and 17-6.180 regarding compliance with the above requirements. Appropriate disinfection and pH control of effluents shall also be required.

2. Surface water disposal via ocean outfall

a. All domestic wastewater treatment plants discharging to Class III coastal waters shall meet, at a minimum, the appropriate secondary treatment criteria contained in Subsection (1)(a)1., above. Appropriate disinfection and pH control of the effluents shall also be required. Discharges to coastal waters are subject to the applicable limitations of Section 17-6.080.

b. All domestic wastewater treatment plants discharging to open ocean waters are required, at a minimum, to provide secondary treatment as defined herein. New treatment plants and modifications of existing plants shall be designed to achieve an effluent prior to discharge containing not more than 30 mg/l BOD and 30 mg/l TSS, or 85% removal of these pollutants from the wastewater influent, whichever is more stringent. All facilities, whether new or existing, shall be operated to achieve, at a minimum, the specified effluent limitations (30 mg/l) and shall be subject to the provisions of Sections 17-6.160 and 17-6.180 regarding compliance with the above requirements. Appropriate disinfection and pH control of the effluents shall also be required. Deviations from the minimum design and operating levels of treatment for all facilities, whether new or existing, discharging to open ocean waters may only be approved pursuant to Section 17-6.080(2)(f).

3. Land application or groundwater disposal (excluding underground injection)

a. The secondary treatment criteria specified in Subsection (1)(a)1., above, at a minimum, generally are applicable as preapplication waste treatment requirements for all facilities, whether new or existing. The design for more stringent levels of treatment may be required by the department as a result of the method of <u>reclaimed water or</u> effluent application/distribution; the extent of intended public access; the characteristics of the potential receiving surface waters (i.e., where

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

overland flow runoff or application site underdrainage is involved); or groundwater protection pursuant to effluent disposal provisions of Section 17-6.080(3).

b. Under the restricted conditions stipulated in applicable portions of Rule 17-610, F.A.C., ~~Section 17-6.040(4)(q)~~ for overland flow and certain underdrained slow-rate land application systems, preapplication concentrations of BOD and TSS in the effluent prior to discharge onto application sites are not required to be in conformance with the secondary treatment standard specified above. However, the secondary treatment standard, at a minimum, shall be met prior to final effluent release to surface waters via facilities designed for operational control of effluent.

4. Groundwater disposal via underground injection

a. The secondary treatment criteria specified in Subsection (1)(a)1. above, at a minimum, shall apply to all facilities utilizing Class I wells injecting domestic effluent into Class G-IV waters. Deviations from the minimum design and operating levels of treatment for such facilities may only be approved pursuant to Section 17-6.080(4)(d).

b. The design of new facilities and modifications of existing facilities to achieve pollutant reduction to levels beyond that specified by secondary treatment shall be required for effluents discharged from Class V wells into Class G-II waters. These levels shall be as specified in Section 17-6.080(4)(b).

(b) Additional Levels of Treatment

1. The design of new facilities and modification of existing facilities to achieve pollutant reduction to levels beyond that specified by secondary treatment shall be required prior to discharge to Class I waters. Class I reliability, as described in Section 17-6.040(4)(m), shall be provided at a minimum. Treatment shall be provided such that effluent limitations generally are met after disinfection (However, reasonable assurances shall

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

be provided that the TSS limitation in 1.b., below, will be achieved at all times prior to disinfection regardless of the actual effluent compliance monitoring location.) and:

a. effluent discharge meets water quality standards pursuant to Section 17-6.060(2) below (no mixing zone shall be allowed); and

b. effluent discharge shall not exceed 5 milligrams per liter TSS; and

c. effluent discharge shall not exceed 10 milligrams per liter TN; and

d. effluent contains maximum pollutant levels less than those specified for community water systems in Chapter 17-22, FAC. These criteria may be relaxed, by the department, up to the level of the ambient receiving surface water characteristics (but in no case to exceed the levels set for Class I waters) where such characteristics exceed the levels stipulated in Chapter 17-22, FAC; or to reflect the characteristics of water reaching the sewer system which may violate community drinking water standards prior to further contamination (if any) resulting from the introduction of domestic and/or industrial wastes. Enforcement of community drinking water standards shall be pursuant to Chapter 17-22, FAC.

2. The design of facilities to achieve pollutant reduction to levels beyond that specified by secondary treatment may be required for reclaimed water or effluents discharged from land application sites (including site underdrainage systems) to surface waters in order to maintain water quality standards for the receiving waters. These levels may be established via WQBELs (i.e., Subsection (3)(a)~~(2)(a)~~, below).

~~(c) Disinfection~~

~~1. All wastewater treatment facilities shall be designed and operated such that disinfection to the extent necessary to protect public health is provided and the microbiological pollutants shall not violate the criteria for the receiving waters (if any), as contained in Chapter 17-3, FAC.~~

~~2. The department is cognizant of the potentially harmful effects of chlorine used in conjunction with wastewater treatment and encourages the use of alternative disinfection methods. Residual levels, or similar-~~

CODING: Words underlined are additions; words in ~~struck through~~ type are deletions from existing law.

~~criteria for establishing disinfection of alternative disinfectants, may be accepted by the department based upon information provided by the permittee in the engineering report which serves as evidence that appropriate microbiological criteria will be met and which provides reasonable assurance of public health protection. Dechlorination may be required by the department to ensure that applicable water quality standards will be met and other appropriate effluent limitations imposed pursuant to this chapter will be achieved. Maximum permissible residual levels in the effluent immediately following chlorination and the necessity for dechlorination shall be established as appropriate based upon information provided by the permittee in the engineering report regarding impacts on the receiving surface or ground water; such residual levels are subject to department approval.~~

~~3. Disinfection criteria are specified below for discharges from all facilities; applicability of the criteria to effluent disposal alternatives shall be as contained in Section 17-6.080. Microbiological requirements generally shall be met prior to achieving other required effluent limitations.~~

~~a. A basic level of disinfection, hereinafter referred to as "basic disinfection", shall result in not more than 200 fecal coliform values per 100 ml of effluent sample. Where chlorine is utilized for disinfection, maintenance of 0.5 mg/l minimum total chlorine residual after 15 minutes contact time at maximum daily flow, or after 30 minutes contact time at average daily flow, whichever provides for the higher level of public health protection, shall be accepted as evidence that the microbiological criterion will be met.~~

~~b. A higher level of disinfection, hereinafter referred to as "high level disinfection", utilized in conjunction with additional TSS control (beyond secondary treatment levels) to maximize disinfection effectiveness shall result in an effluent for which fecal coliforms (per 100 ml of sample) are below detectable limits. Where chlorine is utilized for disinfection, maintenance of 1.0 mg/l total chlorine residual after 15-~~

CODING: Words underlined are additions; words in ~~struck through~~ type are deletions from existing law.

~~minutes contact time at maximum daily flow, or after 30 minutes contact time at average daily flow, whichever provides for the higher level of public health protection, shall be accepted as evidence that the above microbiological criterion will be met.~~

~~c. An intermediate level of disinfection, hereinafter referred to as "intermediate disinfection", shall result in not more than 14 MPN fecal coliform values per 100 ml of effluent sample. Where chlorine is utilized for disinfection, residual criteria contained in b., above, shall apply.~~

~~d. A lower level of disinfection, hereinafter referred to as "low level disinfection", allowable under highly controlled conditions for overland flow and certain underdrained slow rate land application systems as specified in applicable portions of Section 17-6.040(4)(q), shall result in an effluent containing not more than 2400 fecal coliform values per 100 ml of sample.~~

(c)~~(d)~~ pH.

All facilities shall be designed and operated to maintain the effluent ~~values for~~ pH in the reclaimed water or effluent, after disinfection, within the range of 6.0 to 8.5, except as provided in Section 17-6.055(13)(b), F.A.C.

(2) Disinfection

(a) All wastewater treatment facilities shall be designed and operated such that disinfection to the extent necessary to protect public health is provided and the microbiological pollutants shall not violate the criteria for the receiving waters (if any), as contained in Chapter 17-3, FAC.

(b) The Department is cognizant of the potentially harmful effects of chlorine used in conjunction with wastewater treatment and encourages the use of alternative disinfection methods. Residual levels, or similar criteria for establishing disinfection of alternative disinfectants, may be accepted by the Department based upon information provided by the permittee in the engineering report which serves as evidence that appropriate microbiological criteria will be met and which provides reasonable assurance

of public health protection. Dechlorination may be required by the Department to ensure that applicable water quality standards will be met and other appropriate reclaimed water or effluent limitations imposed pursuant to this rule will be achieved. Maximum permissible residual levels in the reclaimed water or effluent immediately following chlorination and the necessity for dechlorination shall be established as appropriate based upon information provided by the permittee in the engineering report regarding impacts on the receiving surface or ground water; such residual levels are subject to Department approval.

(c) Disinfection criteria are specified below for discharges from all facilities; applicability of the criteria to reuse or effluent disposal alternatives shall be as contained in Section 17-6.080 or in Rule 17-610, F.A.C. Microbiological requirements generally shall be met prior to achieving other required reclaimed water or effluent limitations.

(d) Basic disinfection

1. Facilities to provide a basic level of disinfection, hereinafter referred to as "basic disinfection", shall be designed to result in not more than 200 fecal coliform values per 100 ml of reclaimed water or effluent sample.

2. Where chlorine is utilized for disinfection, maintenance of at least 0.5 milligram per liter total chlorine residual after at least 15 minutes contact time at maximum daily flow, or after at least 30 minutes contact time at average daily flow, whichever provides for the higher level of public health protection, shall be provided. Higher residuals or longer contact times may be needed to meet the operational criteria for basic disinfection.

3. In order to determine compliance of a domestic wastewater facility with the basic disinfection level, the following operational criteria (using either MF or equivalent MPN methods) shall be applicable.

a. The arithmetic mean of the monthly fecal coliform values (computed as per b., below) collected during an annual period, as described in Rule 17-6.180(1)(a)1, F.A.C., shall not exceed 200 per 100 ml of reclaimed water or effluent sample.

b. The geometric mean of the fecal coliform values for a minimum of 10 samples of reclaimed water or effluent, each collected on a separate day during a period of 30 consecutive days (monthly), shall not exceed 200 per 100 ml of sample.

c. No more than 10 percent of the samples collected during a period of 30 consecutive days shall exceed 400 fecal coliform values per 100 ml of sample.

d. Any one sample shall not exceed 800 fecal coliform values per 100 ml of sample.

(e) High-level disinfection

1. Facilities to provide a higher level of disinfection, hereinafter referred to as "high-level disinfection", utilized in conjunction with additional TSS control (beyond secondary treatment levels) to maximize disinfection effectiveness shall be designed to result in a reclaimed water or effluent in which fecal coliform values (per 100 ml of sample) are below detectable limits.

2. Where chlorine is utilized for disinfection, maintenance of at least 1.0 milligram per liter total chlorine residual after at least 15 minutes contact time at maximum daily flow, or after at least 30 minutes contact time at average daily flow, whichever provides for the higher level of public health protection, shall be provided. Higher residuals or longer contact times may be needed to meet the operational criteria for high-level disinfection.

3. Facilities shall be designed to reduce TSS to less than 5 milligrams per liter prior to the application of the disinfectant.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

4. In order to determine compliance of a domestic wastewater facility with the high-level disinfection level, the following operational criteria (using MF or equivalent MPN methods) shall be applicable.

a. At least 75 percent of the fecal coliform values obtained on a separate day during a period of 30 consecutive days (monthly) shall be below detectable limits.

b. Any one sample shall not exceed 25 fecal coliform, values per 100 ml of sample.

c. Any one sample shall not exceed 5 milligrams per liter of TSS at a point prior to application of the disinfectant.

(f) Intermediate disinfection

1. Facilities to provide an intermediate level of disinfection, hereinafter referred to as "intermediate disinfection", shall be designed to result in not more than 14 MPN fecal coliform values per 100 ml of reclaimed water or effluent sample.

2. Where chlorine is utilized for disinfection, maintenance of at least 1.0 milligram per liter total chlorine residual after at least 15 minutes contact time at maximum daily flow, or after at least 30 minutes contact time at average daily flow, which ever provides for the higher level of public health protection, shall be provided. Higher residuals or longer contact times may be needed to meet the operational criteria for intermediate disinfection.

3. In order to determine compliance of a domestic wastewater facility with the intermediate disinfection level, the following operational criteria (using either MF or MPN methods) shall be applicable:

a. The arithmetic mean of the monthly fecal coliform values (computed as per b., below) collected during an annual period, as described in Rule 17-6.180(1)(a)1., F.A.C., shall not exceed 14 per 100 ml of reclaimed water or effluent sample.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

b. The median value of the fecal coliform values for a minimum number of 10 samples of reclaimed water or effluent, each collected on a separate day during a period of 30 consecutive days (monthly) shall not exceed 14 per 100 ml of sample.

c. No more than 10 percent of the samples collected during a period of 30 consecutive days shall exceed 43 fecal coliform values per 100 ml of sample.

d. Any one sample shall not exceed 86 fecal coliform values per 100 ml of sample.

(g) Low-level disinfection :

1. Facilities to provide a lower level of disinfection, hereinafter referred to as "low-level disinfection", allowable under highly controlled conditions for overland flow and certain underdrained slow-rate land application systems as specified in applicable portions of Rule 17-610, F.A.C., shall be designed to result in an effluent containing not more than 2400 fecal coliform values per 100 ml of sample.

2. In order to determine compliance of a domestic wastewater facility with the low-level disinfection criteria, the design criteria in 1., above, shall apply as operational criteria at all times.

3. Other operational criteria in this section shall be applicable to effluent involving low-level disinfection preapplication treatment upon release of the effluent from operational control in order to determine compliance with other requirements of this chapter.

(3)~~(2)~~ Water Quality-Based Effluent Limitations (WQBELs)

(a) Surface water discharge ~~disposal~~

1. In addition to TBELs specified in Subsection 17-6.060(1), above, the design of facilities may be required to provide for additional treatment to satisfy water quality standards for receiving surface waters.

2. The WQBELs shall be determined by the department in accordance with Sections 17-6.400, .401, .402 and .403, FAC, and shall be based upon the characteristics of the discharge, the receiving water characteristics, and

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

the criteria and standards of Chapters 17-3, 17-4, FAC, and this Chapter. Requests for zones of mixing and any previous approved zones of mixing will be taken into consideration when determining WQBELS. No zone of mixing, as contained in Section 17-4.244, FAC, shall be provided for any parameters for which the permittee fails or declines to provide the necessary characteristics of the discharge. WQBELs shall be met after disinfection.

3. The WQBELs shall be determined by application of accepted scientific methods. It is recognized that models and other scientific methods of predicting the concentrations of pollutants result in estimated values of concentrations. Such estimates shall be acceptable for the purpose of determining effluent limitations provided that the most reliable and complete data reasonably available to the department have been applied. Accepted scientific methods shall be based upon, but not limited to, a consideration of the following:

a. The condition of the receiving body of water, including present and future flow conditions and present and future sources of pollutants; and

b. The nature, volume, and frequency of the proposed discharge of waste, including any possible synergistic effects with other pollutants or substances which may be present in the receiving body of water.

(b) Groundwater <u>discharge</u> ~~disposal~~

1. In addition to any TBELs specified in Section 17-6.060(1), above, the design of facilities may be required to provide for additional treatment to satisfy water quality standards for receiving groundwaters.

2. Such limitations shall be established by the department based upon characteristics of the <u>reclaimed water or</u> effluent discharge and other information such as project location, soils, hydrogeologic conditions, ambient water quality, the considerations listed in the provisions of Section 17-4.245, FAC, and other relevant factors the department may deem appropriate.

Specific Authority: 403.061, 403.087, F.S.

Law Implemented: 403.021, 403.061, 403.062, 403.085, 403.086, 403.087, 403.088, F.S.

History: New 1-1-82, Amended 5-31-82, 1-29-84, 4-27-86, 8-4-86,_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-6.070 - No change.

17-6.080 Reuse and Effluent Disposal.

(1) Surface Water Discharge (excluding ocean outfalls and wetlands)

(a) Outfalls for all facilities, whether new or existing, shall not discharge reclaimed waters or effluents which do not meet, at a minimum, applicable secondary treatment, basic disinfection and pH levels contained in Section 17-6.060 prior to discharge to the receiving surface waters.

(b) Outfalls for new facilities or modifications of existing facilities shall not discharge reclaimed waters or effluents to Class I waters unless the reclaimed water or effluent meets the appropriate additional treatment standards (beyond secondary) and high-level disinfection criteria contained in Sections 17-6.060(1)(b) and 17-6.060(2)(e)~~(c)~~, respectively, prior to discharge to the receiving surface water. Outfalls for new facilities or modifications of existing facilities shall discharge not less than 500 feet from any existing or approved (but not yet constructed) potable water intake. However, all facilities, whether new or existing, shall provide for the TSS control (referenced in Section 17-6.060(1)(b)1.) and high-level disinfection, or an alternative to these combined requirements, to ensure protection from virus.

(c) Outfalls potentially discharging to waters contiguous to Class I waters

The necessity for treatment in addition to that required in (a), above, shall be dependent upon the extent of travel time. Travel time shall be the elapsed time from the point of final reclaimed water or effluent monitoring to reclaimed water or effluent arrival at the boundary of Class I waters or at the 500 foot no discharge zone surrounding potable water intakes (if any), as referenced in (b), above, whichever results in the shorter elapsed time. Travel time determinations shall be based upon the expected flow of the receiving water during the typically wettest month of the year. Information available from public or private scientific or engineering firms

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

may be utilized; velocity data from other waters may be used provided it is documented in the engineering report that the water body from which such data is derived is hydrologically similar to the receiving water at issue.

1. Effluent or reclaimed water discharged from all facilities to waters tributary or contiguous to Class I waters, regardless of whether travel time is greater than 4 hours, shall be subject to technology-based or water quality-based limitations imposed for the specific receiving waters in accordance with Section 17-6.060(1) or (3)~~(2)~~; and additionally

2. Whenever travel time of the reclaimed water or effluent is less than or equal to 4 hours, new facilities and modifications of existing facilities discharging to waters tributary or contiguous to Class I waters, shall be required to provide wastewater treatment such that the drinking water criteria set by Chapter 17-22, FAC, will not be violated at the edge of the mixing zone (which shall not extend into Class I waters). However, Chapter 17-22 criteria may be relaxed up to the level of ambient receiving surface water quality (but in no case violate the water quality criteria for Class III waters) where ambient water quality is lower than the criteria stipulated in Chapter 17-22, FAC; or to reflect the quality of water reaching the sewer system which may violate community drinking water standards prior to further contamination (if any) resulting from the introduction of domestic and/or industrial wastes. Enforcement of community drinking water standards shall be pursuant to Chapter 17-22, FAC.

a. Class I reliability, as described in Section 17-6.040(4)(m), shall be provided, at a minimum, for new facilities and modification of existing facilities. Provisions for automatic notification of downstream potable water treatment facilities and effluent recirculation to ensure adequate wastewater treatment shall be included for reliability assurance.

b. Effluent or reclaimed water storage prior to discharge to receiving waters may be required. Storage volume requirements shall be equal to the maximum daily flow (at which adequate treatment can be provided) of the facility multiplied by the sum of the number of full (24 hours) days per

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

week when the operator is not on-site. The operator may be on-site more often than required pursuant to Chapter 17-16, FAC; where on-site attendance is provided in lieu of storage capacity, such attendance schedules shall be stipulated by permit.

(d) Outfalls shall not discharge reclaimed water or effluents into Class II waters.

(e) Limitations beyond the minimum secondary treatment, basic disinfection and pH levels that are required, or (as appropriate) additional WQBELs, on new facilities which would discharge to waters tributary to or contiguous to Class II waters shall be required when the travel time of effluent or reclaimed water (the elapsed time from the point of final disinfection monitoring to arrival at conditionally-approved or approved shellfish harvesting areas during maximum expected surface water velocities) is less than or equal to 72 hours. Intermediate disinfection, as described in Section 17-6.060(2)(f) ~~17-6.060(1)(e)~~, shall be required for all new and existing facilities. Class I reliability, as described in Section 17-6.040(4)(m), shall be provided at a minimum. Additionally, storage of the disinfected reclaimed water or effluents in a holding pond and recirculating capability (for additional treatment) shall be required as follows:

1. Where the travel time is less than or equal to 24 hours, storage volume requirements shall be equal to the maximum daily flow (at which adequate treatment can be provided) of the facility multiplied by the sum of the number of full days per week when the operator is not on-site plus an additional 24-hour period. The operator may be on-site more often than required pursuant to Chapter 17-16, FAC; where on-site attendance is provided in lieu of storage capacity, such attendance schedules shall be stipulated by permit.

2. Where the travel time is greater than 24 hours, but less than or equal to 72 hours, storage volume requirements shall be equal to the maximum daily flow (at which adequate treatment can be provided) of the facility multiplied by the number of full days per week when the operator is not

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

on-site. The operator may be on-site more often than required pursuant to Chapter 17-16, FAC; where on-site attendance is provided in lieu of storage capacity, such attendance schedules shall be stipulated by permit.

(f) Outfalls shall be designed with respect to depth and location so as to minimize oxygen demand and adverse effects on the receiving water.

(2) Ocean Outfalls

(a) Outfalls for all facilities, whether new or existing, shall not discharge <u>reclaimed water or</u> effluent to coastal or open ocean waters which does not meet, at a minimum, applicable secondary treatment and pH criteria contained in Section 17-6.060. Where applicable, discharges to coastal waters shall be subject to the limitations of Section 17-4.242, FAC, regarding Outstanding Florida Waters, and of Subsections (1)(d) and (1)(e), above, regarding discharges to Class II waters and waters contiguous to Class II waters, respectively.

(b) Outfalls for all facilities, whether new or existing, shall not discharge effluent <u>or reclaimed water</u> to Class III coastal waters which has not also received basic disinfection prior to the discharge. Outfalls for all facilities, whether new or existing, shall not discharge effluent to open ocean waters without also being disinfected to the extent necessary to achieve Class III microbiological standards at the edge of the mixing zone established pursuant to Subsection (d), below. If basic disinfection is not provided, the engineering report shall affirmatively demonstrate the level of disinfection that is more appropriate.

(c) Deviations from minimum waste treatment requirements for effluent discharges to open ocean waters from all facilities, whether new or existing, may only be approved pursuant to (f), below.

(d) Mixing zones for effluent discharges via ocean outfalls may be established as follows:

1. All coastal water discharge facilities shall be subject to the applicable provisions of Section 17-4.244, FAC.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

2. All open ocean water discharge facilities shall be subject to the applicable provisions of Section 17-4.244, FAC, except that:

a. Appropriate dimensions of the mixing zone, for effluents having received treatment in accordance with (c), above, and discharged from new facilities or modifications of existing facilities, may be established by the permittee pursuant to the provisions of (f), below.

b. Mixing zone criteria currently applicable to existing facilities may be modified by order of the Secretary, pursuant to (f), below.

(e) Outfalls for new facilities and modifications of existing facilities shall be designed in accordance with sound engineering practice. General technical guidance is provided by applicable references listed under Section 17-6.040. Additionally:

1. Outfalls shall be designed with respect to depth and location so as to minimize adverse effects on public health and environmental quality. The design shall address the initial dilution, dispersion, and decay rates of the effluent wastes in surrounding waters in order to accomplish these objectives.

2. Outfalls shall be designed to ensure structural integrity so as to minimize potential damage from natural occurrences (e.g., wave action) or human activities (e.g., anchorage).

(f) Alternative levels of treatment may be allowed for ocean outfall discharges to open ocean waters from any facility, whether new or existing, as provided below.

1. The Secretary may issue an order, upon petition of an affected permittee and after public hearing, that specifies alternatives to treatment requirements of Sections 17-6.060(1)(a)2.b. and 17-6.080(2); and mixing zone requirements of Section 17-4.244, FAC; and

2. Such order shall remain in effect as long as applicable water quality criteria specified in Chapter 17-3, FAC, are met and the effluent meets statutory treatment requirements; however,

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

3. Such order may be issued only after affirmative demonstration by the Petitioner of the following:

a. Granting the order is in the public interest; and

b. Compliance with minimum treatment requirements in Sections 17-6.060(1)(a)2.b and 17-6.080(2) for these discharges is not required to assure adequate protection of public health and the marine environment; and

c. Granting the order will not interfere with existing uses or the designated uses of the receiving waters or contiguous waters, or otherwise impair the recreational use, bathing waters, or economic values associated with the area potentially affected by the discharge; and

d. There is no reasonable relationship between the economic, social, and environmental costs of compliance with the treatment requirements and the benefits associated therewith; and

e. Oceanographic features influencing the effects of the proposed discharge support the proposed level of treatment and any proposed extent of the mixing zone; and

f. The facility will be constructed (where applicable) and operated so that there is no occurrence of inadequately treated wastewater reaching contiguous coastal waters; and

g. An acceptable monitoring program for the discharge has been proposed and would be implemented by the permittee.

(3) Land Application

(a) The following requirements are applicable for slow-rate, rapid-rate, overland flow, absorption field and other land application systems potentially discharging to Class G-II groundwaters as described in Chapter 17-3, FAC. Requirements for systems involving potential discharges to other classes of groundwater (as defined by Chapter 17-3, FAC) will be established by the department on a case-by-case basis with the permittee.

(b) Systems shall be designed to meet applicable requirements contained in Rule 17-610, F.A.C. ~~Section 17-6.040(4)(q)~~. Minimum design waste treatment standards specified in (c) below are described in Section 17-6.060 and shall be enforceable pursuant to the operational criteria in Section 17-6.180.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(c) Waste treatment, at a minimum, shall consist of secondary treatment and, to the extent necessary, basic disinfection and pH control. Generally, these criteria are applicable as preapplication waste treatment requirements for all facilities, whether new or existing.

1. Less stringent preapplication treatment levels may be allowed under the restricted conditions stipulated in applicable portions of Rule 17-610, F.A.C., ~~Section 17-6.040(4)(q)~~ for overland flow and certain underdrained slow-rate land application systems; however, regardless of the level of preapplication treatment provided, the effluent finally released to receiving surface water, via the operational control facilities, shall meet the appropriate requirements of Section 17-6.060.

2. Additional levels of preapplication treatment (beyond the minimum) may be required by the department as a result of the method of reclaimed water or effluent application/distribution; the extent of intended public access; the characteristics of the potential receiving surface waters (e.g., where application site underdrainage is designed); or groundwater protection pursuant to reuse or effluent disposal provisions of Rule 17-610, F.A.C. ~~Section 17-6.040(4)(q)~~.

(d) Protection of groundwater quality is of concern. The characteristics of background, or ambient, groundwater quality shall be established. Two general situations will be encountered: background quality characteristics may be at or below the criteria numerically quantified in Chapter 17-3, FAC, (i.e., background quality is equal to, or better than, standards) in which case the land application shall not result in degradation of background water quality in excess of the water quality criteria; or background water quality characteristics may be in excess of the criteria numerically quantified in Chapter 17-3, FAC, (i.e., background quality is worse than standards) in which case the land application shall not result in further degradation of the background water quality. Where a surface water discharge is also involved, the underdrainage or overland flow discharge shall not result in a violation of water quality standards.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(4) Underground Injection

(a) All facilities using Class I wells discharging domestic effluent into Class G-IV waters must meet the secondary treatment and pH limitations specified in Section 17-6.060(1)(a) and (d). Disinfection is not required prior to disposal via any Class I well, whether from any new or existing facility; however, all Class I well permittees must maintain capability to disinfect at a level that is consistent with the alternate discharge mechanism pursuant to Section 17-28.23(4)(c), FAC. Deviations from minimum waste treatment requirements for such discharges may only be approved pursuant to (d), below.

(b) New facilities and modifications of existing facilities using Class V wells discharging domestic effluent into Class G-II waters (except as provided in paragraph (c) below) shall be designed and operated to achieve pollutant reduction to levels beyond that specified by secondary treatment. Class I reliability, as described in Section 17-6.040(4)(m), shall be provided for the treatment plant at a minimum. Effluent limitations shall be met at compliance monitoring location(s) established on a case-by-case basis; however the TSS limitation shall be met prior to disinfection. The following requirements shall be met:

1. Effluent shall contain not more than the concentration set for BOD (and TSS) via secondary treatment criteria in Section 17-6.060(1)(a)1.; and

2. Effluent shall <u>meet the high-level disinfection requirements contained in Rule 17-6.060(2)(e), F.A.C.</u>~~, contain not more than 5 mg/l TSS and no detectable fecal coliforms (high level disinfection criteria)~~; however,

3. As an alternative to 2., above, other methods for ensuring protection from virus may be approved by the department; and

4. Adequate justification for the use of any specific disinfection process and the identification of resulting public health effects shall be provided to the department; and

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

5. The department may require that the effluent meet the criteria for community drinking water systems specified in Chapter 17-22, FAC, or may establish any individual effluent pollutant criterion specified in Chapter 17-22 at a value up to the level occurring in ambient receiving groundwater. However, no criterion may be established at a concentration in excess of Class G-II water quality standards; and

6. The department may require additional reduction of pollutants which otherwise would be discharged in quantities which may reasonably be anticipated to pose risk to public health or the environment because of acute or chronic toxicity; and

7. Storage capability and recirculation of stored effluent, or provisions for alternative disposal systems, shall be established with the department's approval on a case-by-case basis.

(c) New facilities and modifications of existing facilities using Class V wells discharging domestic effluent or reclaimed water into Class G-II waters of the Biscayne or Floridan Aquifers containing total dissolved solids of 500 milligrams per liter or less shall be designed and operated to achieve pollution reduction as specified below.

1. The Environmental Regulation Commission shall hold a public hearing following the conclusion of any pilot test or the full-scale operational test of any project approved pursuant to Section 403.859(7), F.S., and shall modify the requirements of this paragraph, as necessary or appropriate, based on the results of the test data. The reclaimed water or effluent standards described below may be revised if the test data demonstrate that alternative parameters or levels would more effectively control pollutants hazardous to public health and the environment, such as the priority pollutants identified by the United States Environmental Protection Agency and certain lipid-soluble organics.

2. Injected wastewater shall meet the following reclaimed water or effluent standards or such other standards as are adopted by rule in accordance with subparagraph 1. above.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

a. Total organic carbon (as the arithmetic average of any 21 consecutive samples of injected wastewater) shall not exceed 5 milligrams per liter or the background concentration of total organic carbon, whichever is less; no single sample shall exceed 9 milligrams per liter.

b. Total organic halogen shall not exceed 0.2 milligrams per liter (as Cl^-) as the arithmetic average of any 21 consecutive samples of injected wastewater; no single sample shall exceed 0.3 milligrams per liter.

3. A biological testing procedure approved by the Department shall be conducted to determine the mutagenicity of the injected reclaimed water or wastewater.

4. The treatment process prior to injection shall include activated carbon adsorption unless the applicant provides reasonable assurance to the Department that the use of alternative technologies will not result in a discharge of wastes in contravention of the standards described in this paragraph.

5. Alternative and standby disposal or storage facilities shall be provided such that any wastewater not meeting the requirements of this section may be stored for further treatment or disposed of by alternative means approved by the Department.

6. Any project approved pursuant to Section 403.859(7), F.S., shall submit an interim report to the Department one year after the commencement of its full-scale operational test. If a pilot test is conducted prior to the full-scale operational test, an interim report is also required one year after its commencement. The interim report shall describe the technical performance and cost-effectiveness of the test project, as indicated by the test data accumulated during the year. The report shall also discuss the technical and economic feasibility of complying with more and less stringent reclaimed water or effluent standards than those specified in this paragraph. The Department shall promptly review the report and present its analysis to the Environmental Regulation Commission.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

7. No permit shall be issued for the underground injection of reclaimed water or wastewater pursuant to this paragraph until a minimum two-year, full-scale operational test of the project has been concluded, the test data have been reviewed by experienced national authorities, and the reports of the review have been considered by the Department.

8. The requirements of this paragraph are additive and supplement all other requirements imposed by Department rules on the construction and operation of wastewater treatment, reuse, and disposal facilities, including compliance with the ground water quality standards referenced in Fla. Admin. Code Rule 17-3.404.

(d) Surface equipment for all injection well facilities, whether new or existing, shall be such that manual backup capability to monitor wellhead pressure and flow is provided for systems utilizing automatic and continuous recording equipment. The design of new facilities and modifications of existing facilities shall incorporate additional surface equioment considerations such that:

1. Effluent or reclaimed water pumping stations shall be protected from lightning and transient voltage surges. As a minimum, stations shall be equipped with lightning arrestors, surge capacitors or other similar protection devices, and phase protection; and

2. Effluent or reclaimed water pumping stations shall be provided with divided compartments to allow access for repair and maintenance purposes without interrupting operation; and

3. Potential surge and water hammer will not jeopardize the safety and integrity of the injection well system; and

4. Surface equipment for multi-well systems provides operational reliability and flexibility in the event of damage to or failure of the pipeline or a well; and

5. Access to the well for geophysical logging without major modifications is enabled; and

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

6. The wellhead shall be protected in a manner to minimize accidents or vandalism; and

7. Necessary screening for floatable solids prior to injection to avoid plugging of the formation is provided; and

8. Equipment with sufficient reliability and redundancy is provided in accordance with appropriate references contained in Section 17-6.040(4).

(e) Alternative treatment levels may be allowed for Class I well discharges to Class G-IV waters from any facility, whether new or existing, as provided below.

1. The Secretary may issue an order, upon petition of an affected permittee and after public hearing, that specifies an alternative to the treatment requirements specified in Section 17-6.060(1)(a)4.a.; and

2. Such order shall remain in effect as long as applicable water quality criteria specified in Chapter 17-3, FAC, are met and the effluent meets statutory treatment requirements; however,

3. Such order may be issued only after affirmative demonstration by the Petitioner of the following:

a. Granting the order is in the public interest; and

b. Compliance with minimum treatment requirements in Section 17-6.060(1)(a)4.a. for these discharges is not required to assure adequate protection of fresh water storage areas or industrial or utilities supplies, or for present and future potable water supplies; and

c. Granting the order will not interfere with existing uses or the designated uses of the waters or contiguous waters; and

d. The facility complies with all of the requirements for Class I wells in Chapter 17-28, FAC; and

e. There is no reasonable relationship between the economic, social, and environmental costs of compliance with the treatment requirements and the benefits associated therewith; and

f. The facility will be constructed (where applicable) and operated so that there is no occurrence of inadequately treated wastewater reaching other aquifers or surface waters; and

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

g. An acceptable monitoring program for the discharge has been proposed and will be implemented by the permittee; and

h. The receiving aquifer is of sufficient transmissivity to preclude clogging of the formation with the effluent; and

i. The injection well system has sufficient built-in redundancy to assure an alternate disposal method (such alternate disposal shall be limited to emergency events); and

j. The surface equipment for multi-well systems is designed to provide continued partial operation in the event of damage to or failure of a pipeline or well.

Specific Authority: 403.061, 403.087, 403.859, F.S.

Law Implemented: 403.021, 403.061, 403.062, 403.085, 403.086, 403.087, 403.088, 403.859, F.S.

History: New 1-1-82, Amended 5-31-82, 1-29-84, 4-27-86, _____.

17-6.090 - No change.

Subpart C Operation and Maintenance

17-6.100 - No change.

17-6.110 Treatment Plants, Reuse Systems, and Effluent Disposal Systems.

(1) New treatment plants and existing plants which have had modifications which require compliance with the reclaimed water or effluent limitations required by this chapter shall be operated and maintained so as to attain, at a minimum, the reclaimed water or effluent quality required by the operational criteria specified in Sections 17-6.060(2) and 17-6.180(1). Existing treatment plants shall, at a minimum, meet reclaimed water or effluent limitations as specified in currently valid permits pursuant to Section 17-6.160.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(2) The operation of all treatment plants shall be under the supervision of an operator certified in accordance with Chapter 17-16, FAC. All facility operations shall provide for the minimum care and maintenance of the facility in accordance with Chapter 17-16, FAC.

(3) All equipment necessary for the treatment, reuse, and disposal of domestic wastewater shall be maintained, at a minimum, so as to function as intended. In the event odor, noise, aerosol drift, or lighting adversely affect neighboring developed areas at the levels prohibited by Rule 17-6.070(2)(a), corrective action (which may include modifications of the treatment plant) shall be taken by the permittee. Other corrective action may be required to ensure compliance with rules of the department.

(4) All treatment plant permittees shall provide the operating data, records, and analytical results as required to document the operational results of the treatment plant, reuse system, and disposal system. These records shall be transmitted to the appropriate district office of the department, in accordance with Chapter 17-19, FAC.

(5) Copies of the department permit and record drawings pursuant to Section 17-6.140(2)(b)4.; the approved operation and maintenance manual pursuant to Section 17-6.150(2); schedules; logs; and all recorded operating data shall be kept available at all facilities or other acceptable sites approved by the department for use by plant operators and inspection by the department.

(6) All treatment plant permittees shall be responsible for making all facilities safe in terms of public health and safety at all times, including periods of inactivation or abandonment. The permittee shall give the department written notice at least 60 days prior to inactivation or abandonment of a treatment plant and shall specify what steps will be taken to safeguard public health and safety. The permittee may be ordered to undertake additional steps deemed necessary by the department to protect public health and safety.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(7) Land application systems shall be operated and maintained in accordance with the provisions contained in Rule 17-610, F.A.C. ~~Section 17-6.040(4)(q)~~.

(8) All underground injection effluent disposal systems shall be operated and maintained in accordance with the provisions contained in Sections 17-28.33, 17-28.34(1) and 17-28.53, FAC.

(9) Wetlands application systems shall be operated and maintained in accordance with the provisions contained in Section 17-6.055,

Specific Authority: 403.061, 403.087, 403.101, F.S.

Law Implemented: 403.021, 403.061, 403.062, 403.085, 403.086, 403.087, 403.088, 403.101, F.S.

History: New 1-1-82, Amended 5-31-82, 1-29-84, 4-27-86,_____.

17-6.120 THROUGH 17-6.130 - No change.

Subpart D Compliance

17-6.140 THROUGH 17-6.170 - No change.

17-6.180 Enforcement.

(1) Operational Criteria

(a) General

1. The department may establish facility compliance, or noncompliance, with the waste treatment standards of this chapter using the information submitted pursuant to self-monitoring operational reports required by Chapter 17-19, FAC. For such evaluations, the appropriate reclaimed water or effluent compliance concentrations contained in (b), below, shall be applicable. Whenever the department uses the results of a year's operational reports, the annual reclaimed water or effluent compliance concentrations given in (b), below, shall be used for compliance determinations. The annual concentrations obtained from self-monitoring

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

operational reports shall be the average of data from consecutive reporting periods (whether daily, monthly, quarterly, or any other basis) which collectively comprise one year; additional compliance determinations may be made for each successive sampling period.

a. For pollutants which are required to be sampled on a bi-weekly or more frequent basis (per Chapter 17-19, FAC), all reclaimed water or effluent compliance concentrations shall be applicable. The bi-weekly evaluation shall be based upon the concentration limitation specified for a weekly determination.

b. For pollutants which are required to be sampled on a monthly, quarterly (or less frequent basis), the monthly concentration limitation shall be used as the compliance standard. The annual (as established in 1., above) and maximum-permissible levels shall also be applicable.

2. The department may also take enforcement action based on its own sample collection activities using any of the annual, monthly, weekly, or maximum-permissible operating criteria specified in (b), below. Use of such data shall not preclude enforcement action pursuant to the provisions of this or any other chapter of the Florida Administrative Code. The use of grab or composite samples for evaluating annual, monthly or weekly compliance shall be generally consistent with grab or composite sampling technique (as opposed to sample scheduling) requirements of Chapter 17-19, FAC, for the specific design flow of the treatment plant at issue. Maximum-permissible concentrations shall be established by grab sampling due to the transient nature of maximum concentrations; it is expected that such samples will be collected during periods of minimal treatment plant pollutant removal efficiencies or maximum organic loading in the reclaimed water or effluent. Maximum-permissible concentrations are not intended to be representative of average daily conditions of the treatment plant effluent or reclaimed water; grab samples need not be taken at any set time or flow, but the actual time and flow conditions during which such samples are taken shall be recorded.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

3. Nothing in this or any other chapters of the Florida Administrative Code shall preclude the use, by the department, of additional or more representative sampling data in establishing compliance status.

(b) Reclaimed Water or Effluent Compliance Concentrations

The applicability of the reclaimed water or effluent compliance concentrations contained below to all facilities, whether new or existing, shall depend on the treatment requirements referenced, pursuant to Section 17-6.010(5).

1. In order to determine compliance of a domestic wastewater facility with the secondary treatment standards specified in Section 17-6.060(1)(a)1., (1)(a)2.a., and (1)(a)3.a., the following operational criteria shall be applicable.

a. The arithmetic mean of the BOD or TSS values for the reclaimed water or effluent samples collected (whether grab or composite technique is used) during an annual period, as described in Subsection (a)1., above, shall not exceed 20 mg/l.

b. The arithmetic mean of the BOD or TSS values for a minimum of four reclaimed water or effluent samples each collected (whether grab or composite technique is used) on a separate day during a period of 30 consecutive days (monthly) shall not exceed 30 mg/l.

c. The arithmetic mean of the BOD or TSS values for a minimum of two reclaimed water or effluent samples each collected (whether grab or composite technique is used) on a separate day during a period of 7 consecutive days (weekly) shall not exceed 45 mg/l.

d. Maximum-permissible concentrations of BOD or TSS values in any reclaimed water or effluent grab sample at any time shall not exceed 60 mg/l.

2. In order to determine compliance of a domestic wastewater facility with treatment standards more stringent than secondary as specified for additional levels of treatment (i.e., Section 17-6.060(1)(b)), WQBELs (i.e., Section 17-6.060(3)~~17-6.060(2)~~), discharges to contiguous Class I waters (i.e.), Section 17-6.080(1)(c)), discharges via shallow well injection

systems (i.e., Section 17-6.080(4)(b)), and certain reuse or land application systems (i.e., Rule 17-610, F.A.C. ~~Section 17-6.040(4)(q)~~), the following operational criteria shall be applicable.

a. The arithmetic mean of the pollutant values for reclaimed water or effluent samples collected (whether grab or composite technique is used) during an annual period, as described in Subsection (a)1., above, shall not exceed the design concentration established for the reclaimed water or effluent.

b. The arithmetic mean of the pollutant values for a minimum of four reclaimed water or effluent samples each collected (whether grab or composite technique is used) on a separate day during a period of 30 consecutive days (monthly) shall not exceed one and one-quarter times the design concentration for the reclaimed water or effluent.

c. The arithmetic mean of the pollutant values for a minimum of two reclaimed water or effluent samples each collected (whether grab or composite technique is used) on a separate day during a period of 7 consecutive days (weekly) shall not exceed one and one-half times the design concentration specified for the reclaimed water or effluent.

d. Maximum-permissible pollutant concentrations in any reclaimed water or effluent grab sample shall not exceed two times the design concentration specified for the reclaimed water or effluent.

3. In order to determine compliance of a domestic wastewater facility with the alternative secondary preapplication treatment standards specified in applicable portions of Rule 17-610, F.A.C. ~~Section 17-6.040(4)(q)~~, the design criteria specified therein shall apply as operational criteria at all times (i.e., the design criteria applies on an annual, monthly, weekly, and maximum-permissible concentration bases). Other operational criteria in this section shall be applicable upon release of the effluent from operational control in order to determine compliance with other requirements of this chapter.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

~~4. In order to determine compliance of a domestic wastewater facility with the basic disinfection level specified in Section 17-6.060(1)(c)3.a., the following operational criteria (using either MF or equivalent MPN methods) shall be applicable.~~

~~a. The arithmetic mean of the monthly fecal coliform values (computed as per b., below) collected during an annual period, as described in Subsection (a)1., above, shall not exceed 200 per 100 ml of effluent sample.~~

~~b. The geometric mean of the fecal coliform values for a minimum of ten effluent samples each collected on a separate day during a period of 30 consecutive days (monthly) shall not exceed 200 per 100 ml of sample.~~

~~c. No more than ten percent of the samples collected during a period of 30 consecutive days shall exceed 400 fecal coliform values per 100 ml of sample.~~

~~d. Any one sample shall not exceed 800 fecal coliform values per 100 ml of sample.~~

~~5. In order to determine compliance of a domestic wastewater facility with the intermediate disinfection level specified in Section 17-6.060(1)(c)3.c., the following operational criteria (using the MPN method) shall be applicable.~~

~~a. The arithmetic mean of the monthly fecal coliform values (computed as per b., below) collected during an annual period, as described in Subsection (a)1., above, shall not exceed 14 per 100 ml of effluent sample.~~

~~b. The median value of the fecal coliform values for a minimum number of ten effluent samples each collected on a separate day during a period of 30 consecutive days (monthly) shall not exceed 14 per 100 ml of sample.~~

~~c. No more than ten percent of the samples collected during a period of 30 consecutive days shall exceed 43 fecal coliform values per 100 ml of sample.~~

~~d. Any one sample shall not exceed 86 fecal coliform values per 100 ml.~~

~~6. In order to determine compliance of a domestic wastewater facility with the high level disinfection criteria and low level disinfection~~

CODING: Words underlined are additions; words in ~~struck through~~ type are deletions from existing law.

~~criteria specified in Section 17-6.060(1)(c)3.b. and 17-6.060(1)(c)3.d., respectively, the design criteria specified therein shall apply as operational criteria at all times. Other operational criteria in this section shall be applicable to effluent involving low-level disinfection preapplication treatment upon release of the effluent from operational control in order to determine compliance with other requirements of this chapter.~~

4.~~7.~~ In order to determine compliance of a domestic wastewater facility with the secondary treatment standards specified in Sections 17-6.060(1)(a)2.b regarding outfalls discharging to open ocean waters, all operational criteria contained in (b)1., above, shall be applicable except that the annual average limitation shall be identical to the monthly criterion (30 mg/l).

5.~~8.~~ In order to determine compliance of a domestic wastewater facility with disinfection criteria (other than the basic level) specified in Section 17-6.080(2)(b), for outfalls discharging to open ocean waters, the disinfection level approved by the department shall apply as operational criteria at all times (i.e., the design criteria applies on an annual, monthly, weekly, and maximum-permissible concentration bases).

6.~~9.~~ Effluent or reclaimed water compliance criteria, for domestic wastewater facilities established in accordance with Sections 17-6.080(2)(f) and (4)(d), FAC, shall be as approved by the Secretary on a case-by-case basis by Order.

(2) Violations

The following acts and the causing thereof are prohibited.

(a) The release or disposal of excreta, sewage, or other wastewaters or sludge without providing proper treatment approved by the department or otherwise violating provisions of this chapter of other chapters of the Florida Administrative Code.

(b) The failure to construct wastewater facilities substantially in accordance with department approved plans and specifications unless project alterations receive the written approval of the department.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(c) The deliberate introduction of stormwater in any amount into collection/transmission systems designed solely for the introduction (and conveyance) of domestic/industrial wastewater; or the deliberate introduction of stormwater into collection/transmission systems designed for the introduction or conveyance of combinations of storm and domestic/industrial wastewater in amounts which may reduce the efficiency of pollutant removal by the treatment plant.

(d) The acceptance, by the operating authority of a collection/transmission system or by the permittee of a treatment plant, of connections of wastewater discharges which have not received necessary pretreatment or which contain materials or pollutants (other than normal domestic wastewater constituents):

1. which may cause fire or explosion hazards; or

2. which may cause excessive corrosion or other deterioration of wastewater facilities due to chemical action or pH levels; or

3. which are solid or viscous and obstruct flow or otherwise interfere with wastewater facility operations or treatment; or

4. which result in treatment plant discharges having temperatures above 40°C.

(e) The failure to maintain equipment in a condition which will enable the intended function.

(f) The planned (as opposed to emergency) bypassing of components critical to functioning of the treatment plant as designed, or any other critical part of a wastewater facility, without notification to the department. (The department may not require notification where design redundancy and reliability characteristics provide reasonable assurance that disposal of excreta, sewage, other wastewaters, or sludge, without having received proper treatment approved by the department, will not occur.)

(g) The submission, by the owner, manager, or operator of a domestic wastewater facility, or agent or employee thereof, of misleading, false, or inaccurate information or operational reports to the department, either knowingly or through neglect. -

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

~~(h) Land application of effluent which results in direct effluent contact with crops intended directly for human consumption unless preapplication treatment levels meet, at a minimum, the requirements for slow-rate land application in public access areas (i.e., Section 17-6.040(4)(q) and unless the permittee affirmatively demonstrated to the department that processing of the crops will inactivate (or remove) pathogens and that all precautions necessary to protect public health will be taken. Any operating permit which may be issued shall identify the crop and stipulate the conditions under which land application may be practiced.~~

~~(i) The operation of land application effluent discharge equipment when authorized persons (other than operators who have taken precautionary measures to minimize contact with the effluent) are known to be within the wetted area (when there is a reasonable possibility of direct contact with the effluent) unless preapplication treatment levels meet the requirements for slow-rate land application in public access areas (i.e., Section 17-6.040(4)(q)).~~

~~(j) The operation of land application projects such that wastewater effluents, including effluent from spray irrigation and aerosol drift, reach within 100 feet of outdoor public eating, drinking, or bathing facilities.~~

~~(k) The grazing of dairy cattle whose milk is intended for human consumption on pastures onto which effluent has been applied until 15 days after application.~~

(h)~~(l)~~ No owner or permittee of a wastewater treatment plant shall knowingly allow or encourage any operator in his employ to violate any rule, regulation, or law related to treatment plant operation.

Specific Authority: 403.061, 403.087, F.S.

Law Implemented: 403.021, 403.061, 403.062, 403.085, 403.086, 403.087, 403.088, 403.121, 403.131, 403.161, F.S.

History: New 1-1-82, Amended 5-31-82, 1-29-84, 5-8-85, _____.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

PART III

WATER QUALITY - BASED EFFLUENT LIMITATIONS

17-6.400 - No Change.

17-6.401 Discharge Permitting Requirements

17-6.401(1) THROUGH (2) - No change.

(3) The department shall encourage reuse Of reclaimed water discharged from domestic wastewater facilities. Since reuse generally requires an alternate discharge which may be to surface waters, the following procedure may be substituted for the WQBEL process for reuse project:

(a) Discharge can be permitted without additional water quality review if all of the following requirements are met:

1. The receiving water body is a Class III stream with a downstream travel time during periods of facility discharge that is greater than 24 hours to any lake, estuary, reservoir, Outstanding Florida Water, or Class I water.

2. During an average rainfall year the receiving water body must provide a stream flow during periods of discharge of not less than the facility's discharge flow times the stream dilution factor. The stream dilution factor (SDF) shall be calculated as:

SDF = P(0.085 CBOD5(mg/l) + 0.272 TKN(mg/l) - 0.484)

where P = percent of the year that discharge will occur during an average rainfall year. (e.g., if discharge will occur 5 percent of the year, then P = 5.)

CBOD5 = the facility's design monthly maximum CBOD5 concentration.

TKN = the facility's design monthly maximum TKN concentration.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

3. Discharge to surface waters shall not exceed 25 percent (91 days) in an average rainfall year.

(b) As an alternative, discharge can also be permitted without additional water quality review if all of the following requirements are met:

1. Discharge is only needed during a year that is wetter than the average rainfall year or following extreme storm events.

2. At least secondary treatment as defined in Rule 17-6.060(1)(a), F.A.C., is provided.

3. The discharge is to a receiving stream with a dilution of greater than 20:1 during the seven-day high flow for the average rainfall year.

(c) If the conditions described in either paragraph (a) or (b) above are not met, a WQBEL analysis will be required. The degree of divergence from the above conditions will determine the complexity of the analysis required.

17-6.401(3) THROUGH (8) RENUMBERED AS 17-6.401(4) THROUGH (9)

Specific Authority: 403.061, 403.087, F.S.

Law Implemented: 403.021, 403.061,403.062, 403.085, 403.086, 403.087, 403.088, F.S.

History: New 8-4-87, Amended _____.

17-6.402 THROUGH 17-6.500 - No change.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

RULES

OF THE

DEPARTMENT OF ENVIRONMENTAL REGULATION

CHAPTER 17-610

REUSE OF RECLAIMED WATER AND LAND APPLICATION

I. GENERAL

II. REUSE; SLOW-RATE LAND APPLICATION SYSTEMS; RESTRICTED PUBLIC ACCESS

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

III. REUSE; SLOW-RATE LAND APPLICATION SYSTEMS; PUBLIC ACCESS AREAS, RESIDENTIAL IRRIGATION, AND EDIBLE CROPS

17-610.450 Description of System

17-610.451 Minimum System Size

17-610.460 Waste Treatment and Disinfection

17-610.462 Reliability

17-610.463 Monitoring and Operating Protocol

17-610.464 Storage

17-610.465 Holding Ponds

17-610.467 Surface Runoff Control

17-610.468 Access Control and Warning Signs

17-610.469 Application/Distribution System

17-610.470 Potable Water Cross-Connections

17-610.471 Buffer Zones

17-610.472 Subsurface Drainage

17-610.473 Hydraulic Loading Rates

17-610.474 Monitoring of Ground Water

17-610.475 Edible Crops

17-610.476 Toilet Flush

17-610.490 Permitting concept

17-610.491 Additional Operation and Maintenance Requirements

IV. REUSE; RAPID-RATE LAND APPLICATION SYSTEMS

17-610.500 Description of System

17-610.510 Waste Treatment and Disinfection

17-610.512 Reliability

17-610.513 Monitoring

17-610.514 Storage

17-610.515 Holding Ponds

17-610.516 Emergency Discharge

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.517 Surface Runoff Control

17-610.518 Access Control and Warning Signs

17-610.521 Buffer Zones

17-610.522 Subsurface Drainage

17-610.523 Hydraulic Loading Rates and Cycles

17-610.524 Monitoring of Ground Water

17-610.525 Percolation Pond Location

V. REUSE; ABSORPTION FIELD SYSTEMS

17-610.550 Description of System

17-610.560 Waste Treatment and Disinfection

17-610.562 Reliability

17-610.563 Monitoring

17-610.564 Storage and Alternate Discharge

17-610.565 Holding Ponds

17-610.567 Surface Runoff Control

17-610.568 Access Control and Warning Signs

17-610.571 Buffer Zones

17-610.573 Hydraulic Loading Rates

17-610.574 Monitoring of Ground Water

17-610.575 Absorption Field Location

VI. EFFLUENT DISPOSAL; OVERLAND FLOW SYSTEMS

17-610.600 Description of System

17-610.610 Waste Treatment and Disinfection

17-610.612 Reliability

17-610.613 Monitoring

17-610.614 Storage

17-610.615 Holding Ponds

17-610.617 Surface Runoff Control

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

CHAPTER 17-610

PART I

GENERAL

17-610.100 Scope/Intent/Purpose

(1) Section 403.021(2), Florida Statutes, as amended, the Florida Air and Water Pollution Control Act, established that no wastes are to be discharged to any waters of the state without first being given the degree of treatment necessary to protect the beneficial uses of such water. Toward this end, Sections 403.085 and 403.086, Florida Statutes, set forth requirements for the treatment and reuse or disposal of domestic and industrial wastewater. Section 403.051(3)(a), Florida Statutes, mandates that any Department planning, design, construction, modification or operating standards, criteria, and requirements for wastewater facilities be developed as a rule or regulation. This chapter is promulgated to

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

implement the provisions and requirements of Sections 403.051, 403.085, 403.086, 403.087, 403.088, Florida Statutes, concerning wastewater facilities.

(2) It is the policy of the Department to encourage an applicant, prior to submittal of a permit application, to study and evaluate wastewater treatment alternative techniques and to discuss alternatives with the Department.

(a) The Department encourages inclusion of relevant public health, economic, scientific, energy, engineering and environmental considerations in such evaluations. Each prospective wastewater facility shall be assessed on an individual basis.

(b) The Department encourages environmentally acceptable alternatives which provide the most economic and energy efficient methods of complying with the requirements of this chapter, and promote the beneficial reuse of reclaimed waters and treated residuals.

(3) The Commission, recognizing the complexity of water quality management and the necessity to temper regulatory actions with the realities of technological progress and social and economic well-being, nevertheless, intends to prohibit any discharge of pollution that constitutes a hazard to human health.

(4) These rules shall be construed to assure that all waters of the state shall be free from components of wastewater discharges which, alone or in combination with other substances, are acutely toxic; are present in concentrations which are carcinogenic, mutagenic, or teratogenic to humans, animals, or aquatic species; or otherwise pose a serious threat to the public health, safety, and welfare.

(5) The requirements of this chapter represent the specific requirements of the Florida Department of Environmental Regulation and of Local Pollution Control Programs approved and established pursuant to Section 403.182, F.S., where such authority has been delegated to those programs. It may be necessary for wastewater facilities to conform with requirements of other agencies, established via interagency agreements

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

(e.g., for mosquito control); the absence of reference to such arrangements in this chapter does not negate the need for compliance with those requirements.

(6) The purpose of Rule 17-610 is to provide design and operation and maintenance criteria for land application systems potentially discharging reclaimed waters or domestic wastewater effluent to Class G-II ground waters (as defined by Rule 17-3, F.A.C.). Requirements for systems involving potential discharges to other classes of ground water (as defined by Rule 17-3, F.A.C.) will be established by the Department on a case-by-case basis with the permittee. Supported by moderating provisions, it is intended that Rule 17-610 establish a framework whereby design flexibility and sound engineering practice can be utilized in developing systems with which to manage domestic wastewater in an environmentally sound manner. Operation and maintenance requirements are contained herein in order that as much information as possible on reuse and land application can be presented in a single rule.

(7) Rule 17-610 shall be utilized in conjunction with Rule 17-6, F.A.C. Systems shall be designed in accordance with sound engineering practice. Minimum design waste treatment and disinfection standards are specified in Rule 17-6.060, F.A.C. Additional waste treatment standards, where appropriate, are addressed herein.

17-610.110 Applicability

(1) Unless specifically denoted otherwise, requirements in this rule shall apply to all new reuse and land application systems for which construction permit applications are approved by the Department after the effective date of this rule. This rule also shall apply to all existing facilities when such facilities are to be modified or expanded or if treatment processes are altered such that the quality of reclaimed water or effluent or reliability of such processes is affected. Where

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

violations of permit conditions or water quality standards have occurred, appropriate requirements in this rule may be deemed applicable to existing facilities by the Secretary or designee.

(2) The following sources are exempted from the requirements of this rule:

(a) Any domestic wastewater facility of a design capacity of 2,000 gallons per day average daily flow, or less, which serves the complete wastewater treatment and disposal needs of a single establishment.

(b) Septic tank drainfield systems and other on-site sewage systems with subsurface disposal of a design capacity of 5,000 gallons per day average daily flow, or less, which serve the complete wastewater disposal needs of a single establishment, with the exception of restaurant facilities with greater than 3,000 gallons per day average daily flow or those defined as industrial facilities in this Part, and all commercial laundry facilities.

(c) Other means of individual waste treatment or disposal which are otherwise subject to state regulation.

Specific Authority: 403.061, 403.087, F.S.

Law Implemented: 403.021, 403.061, 403.062, 403.085, 403.086, 403.087, 403.088, F.S.

History: New _____.

17-610.200 Definitions

Terms used in this chapter shall have the meaning specified below. The meaning of any term not defined below, shall be taken from definitions in other rules of the Department, unless such meaning would defeat the purpose or intent of Rule 17-610.

(1) "Department" means the Department of Environmental Regulation.

(2) "Effluent", unless specifically stated otherwise, means water that is not reused after flowing out of any plant or other works used for the purpose of treating, stabilizing, or holding wastes.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(3) "Reclaimed water" means water that has received at least secondary treatment and is reused after flowing out of any plant or other works used for the purpose of treating, stabilizing or holding wastes.

(4) "Reuse" means the deliberate application of reclaimed water, in compliance with Department rules, for a beneficial purpose.

(a) Where appropriate, said uses may encompass:

1. Landscape irrigation (such as irrigation of golf courses, cemeteries, highway medians, parks, playgrounds, school yards, retail nurseries, and residential properties);

2. Agricultural irrigation (such as irrigation of food, fiber, fodder and seed crops, wholesale nurseries, sod farms, and pastures);

3. Aesthetic uses (such as decorative ponds and fountains);

4. Ground water recharge (such as slow-rate, rapid-rate, and absorption field land application systems) but not including disposal methods described in Rule 17-610.200(4)(b);

5. industrial uses (such as cooling water, process water and wash waters);

6. wetlands utilization (such as the use of existing or man-made treatment or receiving wetlands);

7. environmental enhancement resulting from discharge of reclaimed water having received at least advanced wastewater treatment;

8. fire protection; or

9. other useful purposes.

(b) Overland flow land application systems, rapid-rate land application systems providing continuous loading to a single percolation cell, other land application systems involving less than secondary treatment prior to application, septic tanks, and ground water disposal systems using Class I wells injecting effluent or wastes into Class G-IV waters shall be excluded from the definition of reuse.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.300 Engineering Report

(1) In accordance with the requirements and provisions of Rules 17-4 and 17-6, F.A.C., an engineering report shall be submitted in support of construction permit applications for new reuse or land application projects. The requirement for an engineering report for modifications of existing systems and for those existing facilities having past violations of permit conditions or water quality standards shall be a case-by-case determination by the Department. For projects of limited scope (as defined by the Department), information contained in the application together with the best available information referenced below may suffice as the engineering report. Engineering report requirements are described below; information submitted in support of applications shall also be in accordance with Rule 17-4.245(6)(d), F.A.C., as appropriate.

(a) Location Requirements

1. The exact boundaries of the reuse or land application project, with buffer zones shown, shall be located on the most recent USGS topographic maps (7.5 minutes series, where available). These maps, or similar scale maps, shall show present and anticipated land uses within one mile of the site boundaries, based on approved Local Government Comprehensive Land Use Plans where available. The Florida Land Use Cover and Forms Classification System (Rule 17-6.040(4)(r), F.A.C.) shall be utilized in designating the character of the surrounding area.

2. All water supply and monitoring wells within a one mile radius of the land application site shall be located on the maps and identified as to use (e.g., potable) and ownership (e.g., private).

3. If expansion of the proposed facility is anticipated, the area likely to be used in the expansion shall be shown on the maps completed with the above information.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

4. Surface waters classified pursuant to Rule 17-3, F.A.C., within one mile of the project area, shall be described, with respect to their classification, average elevation, uses, and approximate distance from the site.

(b) Soils Information

1. A soils map of the reuse or land application site shall be provided. The soils shall be named and described in accordance with the standard criteria (e.g. soil surveys) of the Soil Conservation Service (SCS) unless advised by the soil scientist of the SCS that soils present are not appropriate for such characterization.

2. Physical characteristics of each significant soil, subsoil, or substratum layer to a depth of 10 feet below the average water table, or to a 20-foot depth (as measured below the lowest point on the site) if no water table is encountered, shall be provided. Representative soil profiles of the site shall be provided and characteristics such as texture, hydraulic conductivity, available water capacity, organic matter content, pH, sodium adsorption ratio, and cation exchange capacity should also be investigated; appropriate chemical characteristics shall be determined for soil profile horizons active in the chemical and biological renovation of reclaimed water or effluent. Specific sites used for determining hydraulic conductivity shall be shown on the soils map, and data shall be submitted to substantiate that the proposed site is hydrologically capable of accommodating the design loading and application rate.

3. For projects involving Type III facilities, and on a case-by-case basis for Type II facilities, the Department may accept an abbreviated report from the permittee addressing the soil characteristics at the proposed site, based upon the best available information in lieu of the more detailed soils information requirements described above.

(c) Hydrogeologic Survey

1. Hydrogeologic data necessary to evaluate the capability of the proposed project to perform successfully at the site on a long-term basis shall be provided. This information shall include geophysical information

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

concerning known "solution openings" and sinkhole prevalence within one mile of the site; the identification (with applicable geologic sections), extent or continuity, and hydrologic characterization of aquifers and confining zones underlying the site (i.e., horizontal and vertical hydraulic conductivities, porosity, thickness); head relationships between aquifer systems; and information on the annual range of ground water elevations at the proposed site.

2. The direction and rate of existing ground water movement (and the points of discharge shall be shown on maps of the area. Similar information regarding conditions anticipated as a result of the project shall be provided.

3. Information on water supply wells (and monitoring wells, as appropriate) identified in Rule 17-610.300(1)(a)2, including the depth, length of casing, cone of depression and geophysical surveys of the wells (if available) shall be provided.

4. The proposed ground water monitoring system shall also be described and displayed. Background water quality data shall be provided.

5. For projects involving Type III facilities, the Department may accept an abbreviated report from the permittee covering the hydrogeologic characteristics at the proposed site, based upon the best available information, in lieu of the more detailed hydrogeologic information requirements described above.

6. For overland flow projects and certain underdrained slow-rate projects involving alternative secondary preapplication treatment levels, determinations of the required number of core samples, representative hydraulic conductivity values, and aquitard extent or continuity shall be included in the engineering report.

(d) Land Management System

1. The present and intended soil-vegetation management program shall be discussed and the vegetative covers identified. Reclaimed water or effluents to be applied shall be characterized in terms of their physical, chemical, and biological properties. Data and other documentation to verify the uptake of nutrients (such as nitrogen and phosphorus), moisture

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

and salt tolerances, pollutant toxicity levels, yield of crops and similar information shall be provided. Water and nutrient budgets for the project shall be included in the engineering report.

2. The harvesting frequencies and the ultimate use of the crops shall be indicated. Lengths of operating seasons, application periods and rates, and resting or drying periods shall also be described. The Department may allow changes in crop types and crop removal intervals.

3. The best available information (and technical assistance) from organizations or individuals qualified in agricultural/agronomic aspects of wastewater reuse shall be used in the preparation of the above report information.

4. Plans for storage, reuse, or disposal of reclaimed water or effluents during crop removal, wet weather, riddance of pests, equipment failures, or other problems precluding land application shall be described.

5. For overland flow projects and certain underdrained slow-rate projects involving alternative secondary preapplication treatment levels, operational control aspects of the land management system discussed in Part VI and Part VII of this rule also shall be documented.

(e) Project Evaluation

1. An evaluation of the overall long-term impact of the proposed project on environmental resources in the area shall be provided. The evaluation shall include aspects such as changes in water table elevations due to natural fluctuations and the reuse or land application project (including ground water mounding that may occur under the site), prediction of the rate and direction of movement of applied reclaimed water or effluent, changes in water quality in the area associated with the project, and similar information.

2. Justification and documentation for utilizing buffer zone minimum-distance criteria, selection of hydraulic loading rates, determining that the reclaimed water or effluents will not violate the standards set by Rules 17-6 and 17-610, F.A.C., and use of any design criteria for which flexibility is provided in this Rule also shall be provided.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

3. An evaluation of the proposed project with respect to public health, safety, and welfare shall be provided.

Specific Authority:

Law Implemented:

History: New_____.

17-610.310 Operation and Maintenance Requirements

(1) Land application systems shall be operated and maintained so as to achieve applicable waste treatment requirements, prior to final release of reclaimed water or effluent to the environment, as required in Rule 17-6.080, F.A.C.

(a) Where all land used as part of the treatment/reuse/disposal system is under the direct control of the permittee for the useful life of the facilities, an operator shall perform the duties for which he is certified under Rule 17-16, F.A.C. The permittee shall maintain control over, and be responsible for, conducting all activities inherent to all reuse and land application systems (e.g., crop removal) to ensure that the entire reuse or waste treatment system operates as approved by the Department.

(b) Where the wastewater treatment plant permittee reuses reclaimed water or disposes of effluent utilizing property owned by another party, a binding agreement between the involved parties is required to ensure that construction, operation, maintenance, and monitoring meet the requirements of Rules 17-6, and 17-610, F.A.C. This requirement is mandatory for all disposal or reuse sites not owned by the permittee. Binding commitments generally shall be for the term of the useful life of the facilities. The permittee shall retain primary responsibility for ensuring compliance with all requirements of the Florida Administrative Code.

(2) Reuse and land application systems designed to utilize crops for the uptake of nutrients from applied reclaimed waters or effluents shall

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

provide for removal of the crop at appropriate intervals, as described in the engineering report and as approved by the Department. The Department may allow changes in crop types and crop removal intervals.

(3) Ground water sampling parameters, schedules, and reporting requirements (where necessary) shall be established pursuant to the provisions of Rule 17-4.245, F.A.C. For each report on ground water quality the permittee shall verify to the Department (based on ground water elevations) the direction(s) of ground water movement from the land application site. In accordance with Rule 17-4.245(6)(k)3., F.A.C. other information requirements may be imposed on any facility whenever there is a change in the permitted volume, location, or composition of the discharge.

(4) The permittee of any reuse or land application system shall be responsible for making facilities safe in terms of public health and safety at all times, including periods of inactivation or abandonment. The permittee shall give the Department written notice at least 60 days prior to inactivation or abandonment of a reuse or land application system and shall specify what steps will be taken to safeguard public health and safety. The permittee may be ordered to undertake additional steps which the department deems necessary to protect public health and safety.

Specific Authority:

Law Implemented:

History: New_____.

17-610.320 Operation and Maintenance Manual

(1) An operation and maintenance manual shall be published for all reuse or land application system, in accordance with Rule 17-6.150(2) F.A.C.

(2) In addition to the requirements specified in Rule 17-6, F.A.C., the operation and maintenance manual shall provide the operator with an adequate description and schedule of routine reclaimed water or effluent

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

application rates and cycles involved with the system; operation procedures (including any notification and reporting requirements of appropriate agencies) during adverse climatic conditions and maintenance of equipment; schedules for harvesting and crop removal; routine maintenance required for the continued design performance of the system; ground water monitoring procedures and schedules; listings of spare parts to have on hand; and any other information essential to the operation of the system in accordance with the requirements of this Rule.

Specific Authority:

Law Implemented:

History: New_____.

PART II

REUSE; SLOW-RATE LAND APPLICATION SYSTEMS; RESTRICTED PUBLIC ACCESS

17-610.400 Description of System

(1) Slow-rate land application systems involve the application of reclaimed water to a vegetated land surface with the applied reclaimed water being treated as it flows through the plant-soil matrix. A portion of the flow percolates to the ground water and some is used by the vegetation. Offsite surface runoff of the applied reclaimed water is generally avoided in design. Surface application techniques include ridge-and-furrow and border strip flooding. Spray irrigation systems can use fixed risers or moving systems, such as center pivots. These systems generally involve the reuse of reclaimed water that has received secondary treatment and basic disinfection.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(2) Public access shall be restricted.

Specific Authority:

Law Implemented:

History: New_____.

17-610.410 Waste Treatment and Disinfection

(1) For all slow-rate systems involving irrigation of sod farms, forests, fodder crops, pasture land, or similar areas where it is intended that public access shall be restricted, preapplication waste treatment shall result in reclaimed water meeting, at a minimum, secondary treatment and basic disinfection levels prior to the land application unless the system is being designed and permitted as an other system pursuant to Part VII. Additional treatment may be required as a result of the alternate discharge, subsurface drainage, or hydraulic loading rate provisions contained below.

Specific Authority:

Law Implemented:

History: New_____.

17-610.411 Reliability

Treatment facilities shall be designed to reliably provide reclaimed water of acceptable quality.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.412 Monitoring of Reclaimed Water

Waste treatment limitations shall generally be met after disinfection and before discharge to holding ponds or to reuse systems.

Specific Authority:

Law Implemented:

History: New_____.

17-610.414 Storage

(1) System storage ponds as described herein may not be required where it is documented in the engineering report that an alternative system (e.g. approved surface water discharge, deep wells) is incorporated into the system design to ensure continuous facility operation in accordance with the requirements of Rule 17-6, F.A.C.

(2) System storage ponds shall have sufficient storage capacity to assure the retention of the reclaimed water under adverse climatic conditions, harvesting conditions, maintenance of irrigation equipment, or other conditions which preclude land application. At a minimum, this capacity shall be the volume equal to six days flow at the annual average daily design flow of the treatment plant.

(3) Additional storage capacity (beyond the minimum requirement) or an alternative discharge system shall be provided for wet weather conditions which preclude land application and shall be described in the engineering report and subject to Department approval. It is recommended that the system storage period be established by determining the volume of storage that would be required for a ten year recurrence interval, using climatic data that is available from, or is representative of, the area involved.

(4) Information regarding techniques for making storage volume determinations is provided in Rule 17-6.040(4)(j), F.A.C. Other analytical means (water balance calculations or computer hydrological

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

programs such as the Department's LANDAP program) of determining system storage requirements may be utilized and shall account for all water inputs into the system. Such methods shall be described and justified in the engineering report. A minimum of 20 years of climatic data shall be used in storage volume determinations.

Specific Authority:

Law Implemented:

History: New_____.

17-610.415 Holding Ponds

(1) System storage ponds may be designed for continuous flow through or off-line storage of the reclaimed water from the treatment plant. For continuous flow through the pond shall be designed such that reclaimed water can be retained for the required storage period. For off-line ponds the reclaimed water transmission system shall be designed such that all produced reclaimed water can be diverted to the pond and retained for the required storage period under conditions which preclude land application.

(2) System storage ponds normally shall be lined or sealed to prevent measurable seepage. The permeability, durability, strength, thickness, and integrity of the liner material shall be satisfactorily demonstrated for anticipated pressure gradient, climatic, installation and daily operation conditions. A quality assurance/quality control plan which substantiates the adequacy of the liner and its installation shall be incorporated or accompany the engineering report. Synthetic liners shall be installed in accordance with the manufacturers specifications and recommendations. Documentation of quality assurance/quality control activities on liner installation along with permeability or seepage test results shall be submitted with the operation permit application.

(3) System storage ponds may be unlined if designed to provide both storage and percolation functions. When designed for percolation such ponds are subject to the provisions of Part IV or Part VII of this rule.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.417 Surface Runoff Control

(1) The land application site shall be designed to prevent the entrance of surface runoff. If necessary, berms shall be placed around the application area for this purpose. Provisions for on-site surface runoff control shall be described in the engineering report and subject to Department approval.

(2) Discharge from perimeter drainage features that collect reclaimed water after land application, may be restricted by surface water quality considerations pursuant to additional treatment or WQBEL provisions of Rule 17-6.060(1)(b) and Rule 17-6.060(2), respectively.

Specific Authority:

Law Implemented:

History: New_____.

17-610.418 Access Control and Warning Signs

(1) For all systems, appropriate warning signs shall be posted around the site boundaries to designate the nature of the project area. Access control to application sites is generally not mandatory. Requirements for access control to holding ponds generally shall be in accordance with Rule 17-6.070(2)(b), F.A.C.

Specific Authority:

Law Implemented:

History: New_____.

17-610.419 Application/Distribution Systems

(1) New reclaimed water application/distribution systems (and replacements of existing systems) shall be designed such that:

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(4) Provisions for monitoring ground water quality adjacent to system storage ponds shall be incorporated into the ground water monitoring plan.

(5) System storage holding ponds shall provide a minimum three feet of freeboard. Holding ponds shall be provided with an emergency discharge or overflow device to prevent water levels from rising closer than one foot from the top to the embankment or berm. The overflow device shall have sufficient capacity to discharge excess flows. Disposition of the overflow discharge shall be identified in the engineering report and show in the plans and is subject to Department approval.

(6) Provisions for the control of algae shall be included in the design, operation and maintenance and described in the engineering report. Pond design shall also address the control of mosquito breeding habitat. Minimum pond depths (excluding freeboard but including the design operating range) of six feet, with inside bank side slopes steeper than 3:1 (horizontal to vertical), but no steeper than 1:1, are recommended to discourage growth of rooted aquatic weeds, maintenance of a minimum pond water depth of 18 inches is recommended. Additionally, routine aquatic weed control and regular maintenance of pond embankments and access areas shall be accomplished. The use of other depth criterion for mosquito control shall be justified in the engineering report.

(7) Ponds shall be sited to avoid areas of uneven natural subsidence, sinkholes, pockets of organic matter or other unstable soils unless provisions are made for their correction. Ponds used to impound reclaimed water above natural grade shall be designed to prevent failure of the embankment due to hydrostatic forces, seepage or soil piping, wind and wave action, erosion and other anticipated conditions. Results from field and laboratory tests from an adequate number of test borings and soil samples shall be the basis for computations pertaining to seepage and stability analyses. Conservative safety factors shall be used in these computations.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

(a) Drawdown of holding ponds shall be accomplished as soon as is appropriate. For this purpose, a minimum hydraulic capacity of 1.5 times the maximum daily flow (at which adequate treatment can be provided) of the treatment plant is recommended; the actual hydraulic criterion selected shall be justified in the engineering report on the basis of holding pond storage capacity, assimilative capacity of the soil-plant system, and similar considerations;

(b) system design facilitates maintenance and harvesting of the irrigated area and precludes damage resulting from the use of maintenance equipment or harvesting machinery;

(c) the system is designed to prevent clogging with algae;

(d) exposed pipes are labeled;

(e) spray equipment is designed and located to minimize aerosol carry-over from the application area (e.g., low pressure sprays) to buffer areas described below; and

(f) above ground hose bibbs (spigots or other hand-operated connections) are not present.

(2) Subsurface application systems may be used if the reclaimed water is made available to the plant root zone and the hydraulic loading rates and cycles comply with Rule 17-610.423, F.A.C.

Specific Authority:

Law Implemented:

History: New_____.

17-610.420 Potable Water Cross-Connections

(1) For all systems, there shall be readily identifiable "non-potable" notices, marking, or coding on application/distribution facilities and appurtenance.

(2) No cross-connections to potable water systems shall be allowed.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.421 Buffer Zones

(1) The permittee shall maintain buffer zones between the wetted site area subject to land application and surface waters and shallow supply wells to ensure compliance with water quality and drinking water standards, and to protect the public health, safety and welfare. All systems shall be designed to minimize adverse affects resulting from noise, odor, lighting and aerosol drift. Adequate site area shall be provided for operation and maintenance, and for controlling emergency discharges.

(2) Slow-rate land application systems shall maintain a distance of 100 feet from the wetted periphery of the land application area to the site property line.

(3) A buffer distance of 500 feet shall be provided from the wetted periphery to existing or approved (but not yet constructed) potable water supply wells; Class I surface waters; or Class II surface waters approved or conditionally approved for shellfish harvesting. This distance may be reduced to 200 feet if facility Class I reliability is provided in accordance with Rule 17-6.040(4)(m), F.A.C. For wells drawing from confined aquifers the minimum buffer distances may be reduced to minimum distances provided in Rule 17-22, F.A.C., based on hydrogeologic conditions, the depth and casing characteristics of such wells and other conditions which shall be identified in the engineering report. Minimum buffer distances to other classes of surface waters shall be established case-by-case based on compliance with applicable water quality standards.

(4) The minimum buffer distances described above shall only be used if, based on review of the soils and hydrogeology of the area, the proposed hydraulic loading rate, quality of the reclaimed water, expected travel time of the ground water to the supply wells and surface waters, and similar considerations, there is reasonable assurance that applicable water quality standards will not be violated.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(5) The wetted periphery of the land application system shall be at least 100 feet from outdoor public eating, drinking, and bathing facilities.

Specific Authority:

Law Implemented:

History: New_____.

17-610.422 Subsurface Drainage

(1) A Subsurface drain system may be necessary to prevent the water table from rising into the plant root zone. The system shall be designed in accordance with appropriate portions of Rule 17-6.040(4)(q) concerning Soil Conservation Service criteria for subsurface drains. The drainage system shall be designed so that the water table is drawn down generally to provide for 36 inches of unsaturated soil thickness during the time when irrigation is not practiced; unsaturated thicknesses less than this value may be approved where justified in the engineering report on the basis of renovating and agronomic aspects of the soil-plant system. Pollutant content (including fecal coliforms) of reclaimed water collected by underdrains may be restricted by surface water quality considerations pursuant to additional treatment or WQBEL provisions of Rule 17-6.060(1)(b) and (3), respectively.

Specific Authority:

Law Implemented:

History: New_____.

17-610.423 Hydraulic Loading Rates

(1) Hydraulic loading rates shall be established after considering the ability of the soil-plant system to remove pollutants from the reclaimed water.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(2) Loading of nitrogen shall be such as to promote utilization by vegetation and nitrification-denitrification reactions in the soil. Other factors which shall be considered in establishing loading rates are the infiltration capacity and hydraulic conductivity of the geologic materials underlying the site; the resulting pollutant load shall be within the assimilative capacity of the soil-plant system. The hydraulic loading rate shall not produce surface runoff or ponding of the applied reclaimed water. Additionally, the existing quality and use of underlying ground water may dictate the loading rates utilized.

(3) Since soil-plant relationships are complex, the initial design loading rate shall be conservative; a maximum annual average of two inches per week is recommended. The department will consider a rate higher that the two inches per week average provided the rate is substantiated in the engineering report on the basis of the renovating and hydraulic capacity of the soil-plant system, the existing quality and use of surface or ground water in the area, and other hydrogeologic conditions.

Specific Authority:

Law Implemented:

History: New_____.

17-610.424 Monitoring of Ground Water

(1) A ground water monitoring well program shall be established by the permittee and approved by the Department, pursuant to Rule 17-4.245, F.A.C. (unless otherwise exempted by that section)

(2) The manual referenced in Rule 17-6.040(4)(0), F.A.C., contains general technical guidance regarding the design and construction of monitoring wells and ground water sampling procedures. Ground water test wells resulting from hydrogeologic exploratory programs, background water quality determinations or other requirements may be approved by the Department for use as part of the compliance monitoring well system.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

(3) Ground water sampling parameters for monitoring background and receiving water quality will be established by the Department on a case-by-case basis, based upon the quality of reclaimed water to be discharged, site specific soil and hydrogeologic characteristics, and other considerations, in accordance with Rule 17-4.245, F.A.C. Water levels shall be recorded prior to evacuating wells for sample collection. Elevation references shall include the top of the well casing and land surface at each well site (NGVD allowable) at a precision of plus or minus 0.1 foot.

Specific Authority:

Law Implemented:

History: New_____.

17-610.425 Cattle Grazing

Land application areas shall not be used for the grazing of cattle whose milk is intended for human consumption for a period of 15 days from the last application of reclaimed water. Grazing of other cattle shall be allowed without restriction.

Specific Authority:

Law Implemented:

History: New_____.

PART III

REUSE; SLOW-RATE LAND APPLICATION SYSTEMS; PUBLIC ACCESS AREAS AND EDIBLE CROPS

17-610.450 Description of System

(1) This type of reuse-system involves the irrigation of areas intended to be accessible to the public, such as residential lawns, golf

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

courses, cemetaries, parks, landscape areas, highway medians and for the irrigation of edible crops. Public access areas may include private property that is not open to the public at large, but is intended for frequent use by many persons. Reclaimed water may also be made available for fire protection, aesthetic purposes (such as decorative ponds or fountains), or other reuse activities. These reuse systems feature reclaimed water that has received high-level disinfection.

Specific Authority:

Law Implemented:

History: New_____.

17-610.451 Minimum System Size

(1) No treatment facility having a design average daily flow less than 0.02 mgd shall have the produced reclaimed water made available for reuse by slow-rate land application in public access areas.

(2) No treatment facility having a design average daily flow less than 0.1 mgd shall have the procedure reclaimed water made available for reuse by slow-rate land application on residential properties or on crops intended for human consumption.

Specific Authority:

Law Implemented:

History: New_____.

17-610.460 Waste Treatment and Disinfection

(1) Preapplication waste treatment shall result in a reclaimed water meeting, at a minimum, secondary treatment and high-level disinfection. The reclaimed water shall not contain more than 5.0 milligrams per liter of suspended solids prior to the application of the disinfectant. An operating protocol as described in Rule 17-610.463, F.A.C., shall be developed and implemented. -

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(2) Filtration shall be provided for TSS control. Chemical feed facilities for coagulant, coagulant aids, or polyelectrolytes shall be provided. Such chemical feed facilities may be idle if the TSS limitation is being achieved without chemical addition.

Specific Authority:

Law Implemented:

History: New_____.

17-610.462 Reliability

(1) The following reliability requirements shall apply. Facility reliability shall have a minimum Class I reliability as described in Rule 17-6.040(4)(m), F.A.C. and additional reliability features as described in the following subparagraphs.

(2) Alarm devices required for various unit processes shall be installed to provide warning of:

(a) Loss of power from the normal power supply,

(b) Failure of a biological treatment process,

(c) Failure of a coagulation process,

(d) Failure of a disinfection process,

(e) Failure of a filtration process, or

(f) Any other specific process failure for which warning is required by the Department.

(3) All required alarm devices shall be independent of the normal power supply of the treatment facility.

(4) The person to be warned shall be the plant operator, superintendent, or any other responsible person designated by the management of the treatment facility and capable of taking prompt corrective action.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

(5) Individual alarm devices may be connected to a master alarm to sound at a location where it can be conveniently observed by the attendant. In case the treatment facility is not attended full time, the alarm(s) shall be connected to sound at a police station, fire station or other full-time service unit with which arrangements have been made to alert the person in charge at times that the treatment facility is unattended.

(6) The power supply shall be provided with one of the following reliability features:

(a) Alarm and standby power source, or

(b) Alarm and automatically actuated reject storage or alternate discharge provisions as specified.

(7) The following treatment unit processes will be provided with the following additional reliability features:

(a) Multiple biological treatment units.

(b) Multiple secondary clarifiers capable of treating entire flow with one unit not in operation.

(c) All coagulation unit processes will have standby feeder and automatic dosage control features for uninterrupted coagulant.

(d) Multiple chlorine unit processes shall be provided with standby chlorine supply, manifold systems to connect chlorine cylinders, chlorine scales, and automatic devices for switching to full chlorine cylinders features for uninterrupted chlorine feed.

(e) Multiple filter units capable of treating entire flow with one unit not in operation.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.463 Monitoring and Operating Protocol

(1) Reclaimed water limitations shall generally be met after disinfection and before discharge to holding ponds or reuse systems. The total suspended solids limitation shall be achieved prior to disinfection regardless of the actual reclaimed water compliance monitoring location. Additional treatment may be required as a result of alternate discharge provisions.

(2) The treatment facility shall include continuous on-line monitoring for turbidity prior to application of the disinfectant. Continuous on-line monitoring of total chlorine residual or for residual concentrations of other disinfectants, if used, shall be provided at the compliance monitoring point. The permittee shall develop and the Department shall approve of an operating protocol designed to ensure that the high-level disinfection criteria will be met prior to release to system storage or reclaimed water reuse systems. The operating protocol shall be reviewed and updated and shall be subject to Department review and approval at least annually. Reclaimed water produced at the treatment facility that fails to meet the criteria established in the operating protocol shall not be discharged into system storage or to the reuse system. Such substandard reclaimed water shall be either stored for subsequent additional treatment or shall be discharged to an approved alternate reuse system requiring lower levels of pretreatment or to an approved alternate discharge system.

Specific Authority:

Law Implemented:

History: New_____.

17-610.464 Storage

(1) Storage may not be required where an alternative discharge is incorporated into the system design to ensure continuous facility operation in accordance with the requirements of Rule 17-6, F.A.C.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

(2) Requirements for system storage pond capacity shall be as contained in Rule 17-610.414, F.A.C., for restricted access slow-rate land application systems. At a minimum, storage capacity shall be the volume equal to six days flow at the annual average daily design flow of the treatment plant. Additional storage or an alternative discharge is required for wet weather conditions.

(3) In addition to storage of reclaimed water for conditions which preclude land application, public access systems shall provide separate, off-line storage of reject water, unless there is an alternative discharge system capable of discharging the reject water in accordance with requirements of Rule 17-6, F.A.C. Reject water storage shall have sufficient capacity to ensure the retention of reclaimed water of unacceptable quality. At a minimum, this capacity shall be the volume equal to one days flow at the annual average daily design flow of the treatment plant. Provisions for recirculating this reject water to other parts of the treatment plant for further treatment shall be incorporated into the design.

Specific Authority:

Law Implemented:

History: New_____.

17-6.610.465 Holding Ponds

(1) Requirements for system storage and reject water holding ponds shall be as contained in Rule 17-610.415 for restricted access slow-rate land application systems.

(2) System storage ponds normally do not have to be lined.

(3) Reject storage ponds shall be lined or sealed to prevent measurable seepage.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

(4) To facilitate the implementation of reuse on golf course sites, the Department will consider the use of existing or proposed golf course ponds for storage of reclaimed water and stormwater management on a case-by-case basis if the use of golf course ponds for reclaimed water storage shall not impair the ability of the ponds to function as a stormwater management system.

Specific Authority:

Law Implemented:

History: New_____.

17-610.467 Surface Runoff Control

(1) Operating criteria including limitations on application during inclement weather shall be established to preclude runoff of reclaimed water from application sites.

Specific Authority:

Law Implemented:

History: New_____.

17-610.468 Access Control and Warning signs

(1) No provisions for access control or warning signs are needed.

Specific Authority:

Law Implemented:

History: New_____.

17-610.469 Application/Distribution Systems

(1) New slow-rate land application systems, expansions of existing distribution systems, and replacement of existing systems shall be designed to provide, at a minimum, hydraulic capacity of 1.5 times maximum

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

daily flow (at which adequate treatment can be provided) of the treatment facility. The actual hydraulic criterion selected shall be justified in the engineering report on the reclaimed water.

(2) Application of reclaimed water on residential properties shall be controlled by agreement with the wastewater management entity or by local ordinance. Above ground hose bibs (spigots or other hand operated connections) shall not be present. Hose bibs shall be located in locked, below grade vaults which shall be clearly labeled as being nonpotable quality.

(3) Reclaimed water shall not be used to fill swimming pools, hot tubs, or wading pools.

17-610.470 Potable Water Cross-Connections

(1) Reclaimed water shall not enter a building containing a dwelling unit. No cross-connections to potable water systems shall be allowed. The permittee shall establish and shall obtain Department approval for a cross-connection control and inspection program.

(2) Maximum obtainable separation of reclaimed water lines and domestic water lines shall be practiced. A minimum horizontal separation of five feet (center to center) or three feet (outside to outside), shall be maintained between reclaimed water lines and either potable water mains or sewage collection lines. The provisions of Rule 17-6.050(2)(g), F.A.C., are applicable to crossings. It is recommended that potable water mains be installed above reclaimed water lines, which in turn should be installed above sewage collection systems.

(3) All reclaimed water valves and outlets shall be appropriately tagged or labeled to warn the public and employees that the water is not safe for drinking or direct contact. All piping, valves, and outlets shall be color coded, or otherwise marked, to differentiate reclaimed water from domestic or other water. All reclaimed water valves, outlets,

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

and sprinkler heads shall be of a type that can only be operated by authorized personnel. Where hose bibs are present on domestic potable water supply lines and on reclaimed water lines, different sizes shall be established to preclude the interchange of hoses. Plastic warning tape on reclaimed water pipelines can be used in addition to the color coding.

(4) Back-flow prevention devices shall be installed on all potable water source connections entering properties served by the reclaimed water system. The device shall consist of a reduced pressure back-flow prevention device or a double check valve assembly.

Specific Authority:

Law Implemented:

History: New_____.

17-610.471 Buffer Zones

(1) A buffer distance of 100 feet shall be provided from the wetted periphery of the public access land application area to potable water supply wells. To comply with this requirement a utility providing reclaimed water for residential irrigation can adopt and enforce an ordinance prohibiting private drinking water supply wells in residential areas. This buffer zone requirement does not apply to closed loop heating or air conditioning return wells.

(2) Buffer distances are not required for surface waters and developed areas.

(3) The wetted periphery of the land application system shall be at least 100 feet from outdoor public eating, drinking and bathing facilities. Drinking fountains located on golf courses or on other public access areas that are provided with an enclosure or covering that will preclude contact with the reclaimed water shall be excluded from this required separation.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

(4) No buffers are required for private swimming pools, hot tubs, spas, saunas, picnic tables, or barbeque pits or grills.

Specific Authority:

Law Implemented:

History: New_____.

17-610.472 Subsurface Drainage

(1) Reclaimed water shall not be applied to residential properties having subsurface drainage systems.

Specific Authority:

Law Implemented:

History: New_____.

17-610.473 Hydraulic Loading Rates

(1) Loading rates shall generally be as specified in Rule 17-610.423, F.A.C.

Specific Authority:

Law Implemented:

History: New_____.

17-610.474 Monitoring of Ground Water

(1)Monitoring of ground water shall be required and shall be established by the Department on a case-by-case basis. Generally, monitoring requirements will be less than those specified in Rule 17-610.424, F.A.C.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.475 Edible Crops

(1) Land application of reclaimed water which results in direct contact with crops intended for human consumption systems may be allowed. The permittee must demonstrate to the Department that processing of the crops will inactivate or remove pathogens and that all necessary precautions to protect public health will be taken. Reclaimed water shall not be used for the cultivation of root crops, fruits, tobacco or vegetables to be eaten or consumed raw.

(2) Reclaimed water may be used for cultivation of fruits, tobacco or vegetables to be eaten raw or consumed raw if the permittee demonstrates that direct contact with the crop will be precluded by the application system and cultivation practices.

(3) Any permit which may be issued shall identify the crop and stipulate the conditions under which land application may be practiced.

Specific Authority:

Law Implemented:

History: New_____.

17-610.476 Toilet Flush

(1) Reclaimed water may be used for toilet flush in commercial or industrial facilities or buildings that do not contain a dwelling unit. Reclaimed water shall not be used for toilet flush in any residential property or dwelling unit.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.490 Permitting Concept

(1) Normally, a single permit for the reuse system will be issued to the wastewater management facility. Regulation and management of individual users of reclaimed water will be by the wastewater management entity through binding agreements with individual users of reclaimed water or by local ordinance. Individual permits for use of reclaimed water will not be issued to individual property owners.

Specific Authority:

Law Implemented:

History: New_____.

17-610.491 Additional Operation and Maintenance Requirements

(1) In addition to the operation and maintenance requirements specified in Rule 17-610.310 and the engineering report requirements specified in Rule 17-610.300, the following requirements apply to reuse systems for irrigation in public access areas.

(a) The permittee shall develop and obtain Department Approval of an operating protocol as discussed in Rule 17-610.463.

(b) The permittee shall develop and obtain Department approval for a back-flow prevention and inspection program as discussed in Rule 17-610.470.

(c) As part of the permit application, the applicant shall submit documentation of controls on individual users of reclaimed water through detailed agreements (including copy of the agreement) or by local ordinance (include copy of appropriate ordinance).

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

PART IV

REUSE; RAPID RATE LAND APPLICATION SYSTEMS

17-610.500 Description of System

(1) This method of land application generally involves reuse of reclaimed water by spreading in a system of percolation ponds (cells) which may be underlain with subsurface drains. The percolation area shall be divided into two or more cells (each of which need not have identical size and shape) to allow for alternate loading and resting. Because of the somewhat limited ability of these systems to renovate reclaimed water, the permittee shall, in the engineering report, address (in detail) potential water quality standards violations arising from the proposed project.

Specific Authority:

Law Implemented:

History: New_____.

17-610.510 Waste Treatment and Disinfection

(1) At a minimum, preapplication waste treatment shall result in a reclaimed water meeting secondary treatment and basic disinfection levels prior to spreading into the pond system. The total nitrogen concentration in the applied reclaimed water shall not exceed 12 mg/l (as nitrogen) unless reasonable assurance is provided in the engineering report that nitrate as measured in any hydraulically down-gradient monitoring well located at the edge of the zone of discharge established in accordance with Rule 17-4.245, F.A.C., will not exceed 10 mg/l or background levels in the receiving Ground water, whichever is less stringent. Design nitrate content of the reclaimed water prior to reuse shall be established

by the permittee subject to Department approval. Additional treatment may be required as a result of the pond location, subsurface drainage, and hydraulic loading rate provisions contained below.

Specific Authority:

Law Implemented:

History: New_____.

17-610.512 Reliability

(1) Treatment facilities shall be designed and operated to reliably provide reclaimed water of acceptable quality.

Specific Authority:

Law Implemented:

History: New_____.

17-610.513 Monitoring

(1) Waste treatment limitations shall be met after disinfection and before discharge to holding ponds or to reuse systems.

Specific Authority:

Law Implemented:

History: New_____.

17-610.514 Storage

(1) System storage generally is not required for rapid-rate land application systems. However, it shall be demonstrated that percolation ponds (cells) or rapid infiltration basins and trenches will function adequately under high ground water conditions and that reclaimed water storage or alternative disposal provisions are not required.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.515 Holding Ponds

(1) Where holding ponds are provided for reclaimed water storage such ponds are subject to the requirements of Rule 17-610.415, F.A.C., for restricted access slow-rate land application systems.

Specific Authority:

Law Implemented:

History: New_____.

17-610.516 Emergency Discharge

(1) Percolation ponds shall be designed and maintained with adequate freeboard in order to protect the integrity of pond embankments. Percolation ponds shall be provided with an emergency discharge device to prevent water levels from rising closer than one foot from the top of the embankment or berm. The overflow device shall have sufficient capacity to discharge potential excess flows. Disposition of the overflow shall be described in the engineering report and shown on the plans and must be approved by the Department.

17-710.517 Surface Runoff Control

(1) The land application site shall be designed to prevent the entrance of surface runoff. If necessary, berms shall be placed around the application area for this purpose. Provisions for on-site surface runoff control shall be described in the engineering report and subject to Department approval.

(2) Discharge from perimeter drainage features that collect reclaimed water after land application, may be restricted by surface water quality considerations pursuant to additional treatment or WQBEL provisions of Rule 17-6.060(1)(b) and Rule 17-6.060(3), respectively. Rapid-rate land

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

application systems that result in the collection and discharge of more than 50 percent of the applied reclaimed water shall be considered as effluent disposal systems.

Specific Authority:

Law Implemented:

History: New_____.

17-610.518 Access Control Warning Signs

(1) For all systems, requirements shall be as contained in Rule 17-610.418, F.A.C. concerning warning signs for slow-rate systems and Rule 17-6.070(2)(b), F.A.C., concerning treatment plant access control.

Specific Authority:

Law Implemented:

History: New_____.

17-610.521 Buffer Zones

(1) Requirements for buffer zones shall be as contained in Rule 17-610.421, F.A.C., for restricted access slow-rate land application systems except as otherwise noted in this section.

(2) Rapid-rate land application systems shall be designed to minimize adverse affects resulting from noise, lighting, aerosol drift, and particularly odors.

(3) A buffer distance of 500 feet shall be provided from the edge of pond, basin, or trench embankments to potable water supply wells; Class I surface waters; or Class II surface waters approved or conditionally approved for shellfish harvesting. The distance to Class I and II surface waters may be reduced to 100 feet if high-level disinfection is provided. The distance to potable water supply wells drawing from confined aquifers may be reduced in accordance with Rule 17-610.421, F.A.C.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

(4) A buffer distance of at least 100 feet shall be maintained between the edge of the pond, basin, or embankments to the site property line.

Specific Authority:

Law Implemented:

History: New_____.

17-610.522 Subsurface Drainage

(1) Subsurface drain systems, where necessary, shall be designed in accordance with appropriate portions of Rule 17-6.040(4)(q) concerning Soil Conservation Service criteria for subsurface drains. The drainage system shall be designed so that the seasonal high water table is drawn down generally to a minimum of 36 inches below pond bottoms during resting periods. Pollutant content (including fecal coliforms) of the reclaimed water collected by the underdrains may be further restricted by surface water quality considerations pursuant to additional treatment or WQBEL provisions of Rule 17-6.060(1)(b) or (3), respectively. Rapid-rate land application systems that result in the collection and discharge of more then 50 percent of the applied reclaimed water shall be considered as effluent disposal systems.

Specific Authority:

Law Implemented:

History: New_____.

17-610.523 Hydraulic Loading Rates and Cycles

(1) Hydraulic loading rates shall be developed on the basis of representative percolation tests (drainfield percolation tests described in Chapter 10D-6.31 F.A.C, are inappropriate) which simulate actual loading conditions that will prevail during the design life of the rapid-rate system. This may involve bench-scale or, preferably,

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

pilot-scale hydraulic testing with either the actual reclaimed water to be applied, where possible, or other water properly adjusted to correspond to the composition of the reclaimed water to be applied. The design loading rate shall allow for the expected gradual reduction in percolation rate due to long-term application of reclaimed water.

(2) The design hydraulic loading (and application) rate shall be related to the hydraulic conductivity and transmissivity and of the geologic formations at the project site which shall be evaluated in-depth by the permittee, with assistance from organizations or individuals qualified by training or experience in soil science, geology, and hydrology.

(3) Since there is a limited ability of these systems to renovate reclaimed water, initial hydraulic loading rates should be conservative (i.e., a rate of 3 inches per day, or 1.9 GPD/FT^2, as an annual average where hydrogeologically feasible and as applied to the total bottom area of percolation cells). The Department will consider higher rates (on the same bases described above) not to exceed 9 inches (5.6 GPD/FT^2) per day. The hydraulic loading rate shall be related to the clear water saturated vertical hydraulic conductivity for the most restrictive layer in the unconsolidated medium underlying the site; additional criteria is contained in Rule 17-6.040(4)(j), F.A.C. However, application rates during the loading cycle for individual percolation cells comprising the system will depend on the hydraulic loading rate and the loading/resting cycle for the system; they should be conservative and shall not exceed 25 percent of the documented vertical hydraulic conductivity, as described above, in order to control ground water mounding and ensure hydraulic performance of the system. Substantiation for the use of selected design hydraulic criteria shall be required in the engineering report based on the pollutant load in the reclaimed water to be applied, the characteristics of the underlying soil and aquifer system, loading and resting cycles to be utilized, and other process design considerations (including denitrification reactions that may be incorporated into the facility's design).

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

(4) Hydraulic loading and resting cycles shall be developed so as to restore operating percolation rates of the pond system to design levels by the end of the resting period. Hydraulic loading periods of 1-7 days with resting periods of 5-14 days to dry the cell bottoms and enable scarification or removal of solids dispositions are recommended. Design loading and resting cycles and other maintenance measures required to ensure system performance shall be described in the engineering report. Systems which achieve restoration of design operating percolation rates on a diurnal cycle will be evaluated on a case-by-case basis as an "other" system (Part VII).

Specific Authority:

Law Implemented:

History: New_____.

17-610.524 Monitoring of Ground Water

(1) Requirements shall be as contained in Rule 17-610.424, F.A.C., concerning ground water monitoring of slow-rate systems.

Specific Authority:

Law Implemented:

History: New_____.

17-610.575 Percolation Pond Location

(1) The physical characteristics of unconsolidated materials overlying the bedrock shall be such that direct rapid movement (short-circuit) of the applied reclaimed water to underlying aquifers does not occur, unless treatment prior to discharge is adequate to ensure compliance with ground water quality provisions of Rules 17-3 and 17-6, F.A.C. A shallow mantle of highly permeable media (e.g., course sands) overlying fractured or cavernous bedrock formations containing potential drinking water supplies is an example of a condition to be avoided. Areas

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

with average depths to the ground water table of ten feet or more are desirable; areas with lesser depths may be acceptable. Subsurface drainage may be required for proper system operation. Also, ponds should be located such that lateral subsurface movement of applied reclaimed water does not unpredictably affect the percolation rates of other cells within the system.

Specific Authority:

Law Implemented:

History: New_____.

PART V

REUSE; ABSORPTION FIELD SYSTEMS

17-610.550 Description of System

(1) This method of land application involves reuse of domestic reclaimed water via discharge to absorption fields. This method, for which the following standards are applicable, involves high rates of reclaimed water application and loading to subsurface absorption fields and is distinguished from "drip" irrigation. Facilities shall be designed such that portions of the absorption field may be isolated for alternate loading and resting without interrupting application of reclaimed water. The application/distribution system shall be designed with appropriate materials and dimensions compatible with the physical (particularly soil) conditions at the specific site.

(2) Absorption fields should be designed to utilize the soil/plant overburden; they should not be designed to have paved or impervious overburden surfaces. Systems designed with paved or impervious overburden surfaces shall be considered by the department on a case-by-case basis as

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

an "other" system (Part VII); particular attention shall be given to the reliability and flexibility of operating and maintaining the proposed application/distribution system as well as the level of preapplication treatment and surface drainage effects on the absorption fields.

(3) Absorption fields shall be designed and operated to preclude saturated conditions at the ground surface.

Specific Authority:

Law Implemented:

History: New_____.

17-610.560 Waste Treatment and Disinfection

(1) For systems designed for restricted public access, preapplication waste treatment shall result in a reclaimed water meeting, at minimum, secondary treatment and basic disinfection levels prior to discharge to the application/distribution system. In addition, the reclaimed water shall contain not more than 10 mg/l TSS prior to discharge to the application/distribution system unless the absorption field and the application/distribution system have been designed to provide specific flexibility and reliability in operation and maintenance of the system; alternatives to the specified TSS limitation, which is intended to ensure non-clogging of the system, shall be established on a case-by-case basis to the satisfaction of the Department. Additional treatment may be required as a result of the absorption field location and hydraulic loading rate provisions contained below.

(2) For systems designed for unrestricted public access, preapplication waste treatment shall result in a reclaimed water meeting, at minimum, the limitations specified in Rules 17-610.460, 17-610.462, and 17-610.463, F.A.C., for slow-rate land application involving unrestricted public access prior to discharge to the application/distribution system.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

(3) The nitrate content of the reclaimed water prior to discharge to the application/distribution system shall not exceed 12 mg/l unless reasonable assurance is provided in the engineering report that nitrate, as a measured in any hydraulically down-gradient monitoring well, will not exceed 10 mg/l, or background levels in the receiving ground water, whichever is less stringent. Design nitrate content of the reclaimed water prior to discharge shall be established by the permittee and subject to Departmental approval.

Specific Authority:

Law Implemented:

History: New_____.

17-610.562 Reliability

(1) Treatment facilities shall be designed and operated to reliably provide reclaimed water of acceptable quality.

Specific Authority:

Law Implemented:

History: New_____.

17-610.563 Monitoring

(1) Waste treatment limitations shall be met after disinfection and before discharge to holding ponds or to reuse systems.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.564 Storage and Alternative Discharge Systems

(1) The requirements for storage and alternate discharge shall be as contained in Rules 17-610.514 and 17-610.515, F.A.C., concerning rapid-rate systems.

Specific Authority:

Law Implemented:

History: New_____.

17-610.565 Holding Ponds

(1) Where holding ponds are provided for reclaimed water storage such ponds are subject to the requirements of Rule 17-610.415, F.A.C., for restricted access slow-rate land application systems.

Specific Authority:

Law Implemented:

History: New_____.

17-710.567 Surface Runoff Control

(1) The land application site shall be designed to prevent the entrance of surface runoff. If necessary, berms shall be placed around the application area for this purpose. Provisions for on-site surface runoff control shall be described in the engineering report and subject to Department approval.

(2) Discharge from perimeter drainage features that collect reclaimed water after land application, may be restricted by surface water quality considerations pursuant to additional treatment or WQBEL provisions of Rule 17-6.060(1)(b) and Rule 17-6.060(3), respectively.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.568 Access Control and Warning Signs

(1) Appropriate warning signs shall be posted around the site boundaries to designate the nature of the project area. Where the system is designed for restricted public access or where the land application site is within 100 feet of outdoor public eating, drinking, or bathing facilities, access control shall be in accordance with Rule 17-6.070(2)(b), F.A.C.

Specific Authority:

Law Implemented:

History: New_____.

17-610.571 Buffer Zones

(1) Buffer zone requirements specified in Rule 17-610.421, F.A.C., for restricted access slow-rate land application systems except as otherwise noted in this section shall apply.

(2) A buffer distance of 500 feet shall be provided from the edge of absorption fields to potable water supply wells; Class I surface waters; or Class II surface waters approved or conditionally approved for shellfish harvesting. The distance to Class I and II surface waters may be reduced to 100 feet if high level disinfection is provided. The distance to potable water supply wells drawing from confined aquifers may be reduced in accordance with Rule 17-610.421, F.A.C.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.573 Hydraulic Loading Rates

(1) Requirements specified in Rule 17-610.573, F.A.C., for hydraulic loading (and application) rates for rapid-rate systems generally shall be applicable to absorption field systems. However, some adjustment of the rates established pursuant to the considerations for rapid-rate system design may be approved by the Department where the permittee establishes the pollutant reduction capabilities of the soil-plant system involved. The loading rates shall be used in conjunction with the absorption field area (computed as the bottom width of the absorption field trench multiplied by the total length of the application/distribution lines) to establish final reclaimed water application rates. Discharge to the application/distribution system shall be at rates which will prevent physical damage to the absorption field or otherwise impair the functioning of the system. The loading and resting period for absorption field systems may vary from that recommended for rapid-rate systems and shall be established by the permittee and documented, complete with justifications, in the engineering report.

Specific Authority:

Law Implemented:

History: New_____.

17-610.574 Monitoring of Ground Water

Requirements shall generally be as contained in Rule 17-610.424, F.A.C., concerning ground water monitoring of slow-rate systems.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.575 Absorption Field Location

(1) The criteria for absorption field siting shall be as contained in Rule 17-610.525, F.A.C., concerning percolation pond location.

Specific Authority:

Law Implemented:

History: New_____.

PART VI

EFFLUENT DISPOSAL; OVERLAND FLOW SYSTEMS

17-610.600 Description of System

(1) This method of land application involves treatment of domestic wastewater generally in order to meet effluent limitations for discharge to surface waters. Wastewater is applied by sprinkling or flooding upper reaches of terraced, sloped, vegetated surfaces, such as sod farms, forests, fodder crops, pasture lands, and similar areas. A runoff conveyance system is provided at the ends of the sloped surfaces.

Specific Authority:

Law Implemented:

History: New_____.

17-610.610 Waste Treatment and Disinfection

(1) Approval of projects involving preapplication treatment below secondary treatment and basic disinfection levels may be given provided the physical site conditions in Rule 17-610.675, F.A.C., are met. Proposed preapplication treatment levels shall provide reasonable assurance that long-term performance of the land treatment system shall,

at a minimum, result in an effluent meeting the secondary treatment and basic disinfection levels prior to release of effluent to the environment via final surface water discharge from land treatment sites. The pollutant content of the final effluent may be more stringently limited via effluent limitations required in Rule 17-6, F.A.C, as required to satisfy water quality requirements.

(2) Preapplication treatment processes shall produce an effluent prior to discharge to holding ponds or to the application/distribution system containing not more than 40-60 mg/l BOD and 40-60 mg/l TSS, and meeting the low-level disinfection criteria of 2400 fecal coliforms per 100 ml. Additional treatment may also be required as a result of the alternate discharge, hydraulic loading rate, and surface runoff control provisions contained below.

Specific Authority:

Law Implemented:

History: New_____.

17-610.612 Reliability

(1) Treatment facilities shall be designed and operated to reliably provide effluent of acceptable quality.

Specific Authority:

Law Implemented:

History: New_____.

17-610.613 Monitoring

(1) Waste treatment limitations shall be met after disinfection and before discharge to holding ponds or to reuse systems.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.614 Storage

(1) System storage ponds shall have sufficient storage capacity to assure the retention of the preapplication wastewaters under adverse climatic conditions, harvesting conditions, maintenance of irrigation equipment, or other conditions which preclude land application. At a minimum, this capacity shall be the volume equal to 1.5 days flow at the annual average daily design flow of the treatment plant.

(2) Additional storage capacity (beyond the minimum requirement) shall be provided based on the need for flow equalization to maintain design hydraulic loading rates or to comply with mass discharge effluent limitations and shall be described in the engineering report and is subject to Department approval.

(3) Information regarding techniques for making overland flow storage volume determinations is provided in Rule 17-6.040(4)(j), F.A.C. Other analytical means (water balance calculations or computer hydrological programs) of determining system storage required for overland flow land application systems may be utilized. Such methods shall be described and justified in the engineering report.

Specific Authority:

Law Implemented:

History: New_____.

17-610.615 Holding Ponds

(1) Requirements for system storage holding ponds shall be as contained in Rule 17-610.415, F.A.C., for restricted access slow-rate land application systems. Where a continuous aquitard is present at the

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

overland flow site such an aquitard may be used to provide assurance of compliance with the liner or seal requirements of Rule 17-610.415, F.A.C.

Specific Authority:

Law Implemented:

History: New_____.

17-610.617 Surface Runoff Control

(1) Requirements shall be as contained in Rule 17-610.417, F.A.C., concerning runoff control for slow-rate systems. All discharges from the application site shall result in maintenance of water quality standards.

Specific Authority:

Law Implemented:

History: New_____.

17-610.618 Access Control and Warning Signs

(1) Requirements shall be as contained in Rule 17-610.418, F.A.C., concerning warning signs for slow-rate systems. Requirements for access control shall be in accordance with Rule 17-6.070(2)(b), F.A.C.

Specific Authority:

Law Implemented:

History: New_____.

17-610.621 Buffer Zones

(1) Requirements for buffer zones shall be contained in Rule 17-610.421. F.A.C., for restricted access slow-rate land application systems except as otherwise noted in this section.

(2) Overland flow land application systems shall maintain a distance of 100 feet from the wetted periphery of the land application area to the site property line, and to potable water supply wells. In addition a buffer distance of 500 feet shall be provided from the wetted periphery to

Class I surface waters; or Class II surface waters approved or conditionally approved for shellfish harvesting.

(3) The wetted periphery of land application systems shall be at least 100 feet from outdoor public eating, drinking, and bathing facilities.

Specific Authority:

Law Implemented:

History: New_____.

17-610.623 Hydraulic Loading Rates and Cycles

(1) A maximum annual average hydraulic loading rate of seven inches (or 4.4 GAL/FT^2) per week as applied to the entire area receiving overland flow is recommended. The Department will consider rates higher than the seven inches per week where rates are substantiated in the engineering report on the basis of the renovative ability of the system or other considerations. Application cycles of wetting and drying the system shall be developed so as to maintain the presence and activity of microogranisms on the soil surface and shall be described in the engineering report.

Specific Authority:

Law Implemented:

History: New_____.

17-610.624 Monitoring of Ground Water

(1) Soil and hydrogeologic conditions shall preclude ground water quality problems from arising, and substantiating data shall be provided to the Department in the engineering report. Ground water monitoring requirements, if any, shall be established pursuant to Rule 17-610.424, F.A.C., concerning ground water monitoring of slow-rate systems.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.675 Design Influences

(1) Due to the objective of overland flow systems, the design will provide for runoff of applied effluents to occur and limited infiltration. Most suited to this type of system are areas with soils of relatively low infiltration and vertical hydraulic conductivity with aquitard(s) in the soil profile.

(2) A continuous aquitard (whether natural or artificial) shall be present in the unconsolidated medium underlying the proposed land application site such that effluent percolating through the soil system above the aquitard is under operational control (for further treatment if necessary). Operational control exists when the percolate flows to the surface drainage system (as opposed to vertical leakage through the aquitard or lateral movement beyond the influence of the drain system). The aquitard is further addressed below:

(a) The confining zone shall be present at relatively shallow depths; shall have a representative hydraulic conductivity of the unconsolidated medium overlying the aquitard; and shall be of such permeability and thickness so as to provide reasonable assurance that downward percolation of waters will be deterred.

(b) The number of soil samples required to determine representative hydraulic conductivity values and to affirmatively demonstrate that a natural aquitard is continuous at a particular site shall be established with the department's approval on a case-by-case basis. Samples shall be spatially distributed throughout the project site. It is recommended that an estimate of sample size required by determined through statistical techniques which, based on the size and variance of an initial number of partially-distributed samples, predict the minimum number of samples required to assure that the population and sample means are within a 95 percent confidence interval.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.

(c) Other methods (e.g., geophysical techniques) to establish the extent and continuity of a natural aquitard may be approved by the department upon justification by the permittee.

(3) Generally, design land surface slopes, slope lengths, and detention times required for the system will be governed by preapplication treatment levels and by final effluent limitations required as a result of receiving water conditions. Land surface slopes of 2-8 percent may be applicable, with slope lengths of 100-300 feet involved.

Specific Authority:

Law Implemented:

History: New_____.

PART VII

OTHER LAND APPLICATION SYSTEMS

17-610.650 General

(1) The following design/performance standards are for other land application systems potentially discharging domestic reclaimed water or wastewater effluent to Class G-II ground waters. The Department may establish requirements for systems not addressed in Rule 17-610.660 or 17-610.670 F.A.C., including systems comprising components of slow-rate, rapid-rate, or overland flow involving potential discharges to ground water or surface water, on a case-by-case basis with the permittee.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

17-610.660 Projects Involving Additional Levels of Preapplication Treatment

(1) Preapplication waste treatment, at least as stringent as that required in Rule 17-610.460, 17-610.461, 17-610.462, F.A.C., for slow-rate land application systems involving unrestricted public access, resulting in reclaimed water or effluents meeting the standards for community drinking water systems stipulated in Rule 17-22, F.A.C, may be required. An individual effluent pollutant criterion (specified in Rule 17-22) of concern may be established, by the Department, at a value up to the level occurring in ambient receiving ground water. Enforcement of community drinking water standards (as opposed to wastewater effluent limitations) shall be pursuant to Rule 17-22, F.A.C. The above wastewater treatment standards shall be applicable to projects which have hydrogeologic or other project characteristics unfavorable for achieving the combined objectives of wastewater renovation, effluent disposal, and ground water protection; generally, new rapid-rate application projects designed for continuous loading to a single percolation cell shall be subject to such standards unless the department is provided with reasonable assurances that additional pollutant removal, if any, will occur in the unconsolidated medium underlying the land application site. The following are additional design considerations for projects of this nature:

(a) storage requirements and the provisions for alternate or back-up disposal systems are established with the Department's approval on a case-by-case basis;

(b) ground water monitoring requirements, if any, shall be established on a case-by-case basis;

(c) facility reliability is established on a case-by-case basis, but in no event shall less than Class I reliability, as described Rule 17-6.040(4)(m), F.A.C, be provided; and

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

(d) buffer zones shall be accordance with Rule 17-610.471, F.A.C., regarding buffer zones for slow-rate systems involving unrestricted public access.

Specific Authority:

Law Implemented:

History: New_____.

17-610.720 Project Involving Lower Levels of Preapplication Waste Treatment

(1) Approval of certain slow-rate land application projects involving restricted public access, underdrain systems, and preapplication treatment standards stipulated in Rule 17-610.660, F.A.C., may be given provided the following physical site criteria and design requirements are met:

(a) The continuous aquitard referenced in Rule 17-610.675, F.A.C., is present in the unconsolidated medium underlying the proposed land application site and an underdrain system is designed and employed such that effluent percolating through the soil system above the aquitard is under operational control (for additional treatment, if necessary). Operational control exists when the percolate flows to the underdrain system (as opposed to vertical leakage through the aquitard or lateral movement beyond the influence of underdrain system); such control exists only when downward movement of the water table is influenced by the underdrain system. The aquitard is further addressed below.

(1) The confining zone shall be present at less than twice the bottom depth of the proposed underdrain system; shall have a representative hydraulic conductivity no greater than 10 percent of the average hydraulic conductivity of the unconsolidated medium overlying the aquitard; and shall be of such permeability and thickness so as to provide reasonable assurance that downward percolation of waters will be

CODING: Words underlined are additions; words in ~~struck-through~~ type are deletions from existing law.

deterred. Design of the underdrain system shall be such as to maintain design water table levels, maximize lateral movement of water toward drains, but prevent overdrainage of the land treatment system; or

(2) Where the zone is present at a greater depth, it shall be demonstrated to the department through appropriate field testing or analytical means that the design underdrain performance standards contained in 1. can be assured under this potentially adverse condition; and

(3) Establishing representative hydraulic conductivity values and affirmative demonstration that a natural aquitard is continuous at a particular site shall be in accordance with Rule 17-610.675, F.A.C.

(b) The proposed project is in accordance with the other appropriate design considerations for slow-rate systems in restricted public access situations as contained in Part III, however, warning sign, access control and buffer zone requirements shall be in accordance with Rule 17-610.668 and 17-610.671, F.A.C., concerning overland flows systems. The Department may require the installation of monitoring well clusters as described in Rule 17-6.040(4)(0), F.A.C.

(c) The project evaluation in the engineering report provides reasonable assurance to the Department that there will be adequate protection of surface and ground water as well as public health, safety, and welfare.

Specific Authority:

Law Implemented:

History: New_____.

CODING: Words <u>underlined</u> are additions; words in ~~struck-through~~ type are deletions from existing law.