**FLORIDA PUBLIC SERVICE COMMISSION**

**Fletcher Building**

**101 East Gaines Street**

**Tallahassee, Florida 32399‑0850**

**M E M O R A N D U M**

**August 5, 1993**

**TO : DIRECTOR, DIVISION OF RECORDS AND REPORTING**

**FROM : DIVISION OF WATER AND WASTEWATER (VON FOSSEN)**

**DIVISION OF LEGAL SERVICES (SUMMERLIN)**

**RE : DOCKET NO: 900181-WS**

**CASE: INVESTIGATION INTO APPROPRIATE RATE STRUCTURES WITH RESPECT TO WATER CONSERVATION POLICIES.**

**AGENDA:AUGUST 17, 1993 ‑ CONTROVERSIAL ‑ PARTIES MAY PARTICIPATE**

**FILE NAME: I:\PSC\WAW\WP\900181.RCM**

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**CASE BACKGROUND**

This docket was initiated in March of 1990 to evaluate the water conservation effect of our present ratemaking methodology and to consider alternate rate structures.

Workshops were held on May 4, 1990 and December 14, 1990 to gather comments from all regulated utilities. A questionnaire was sent to all utilities in June of that year to gather additional information. Additionally, Staff has received input from the Department of Environmental Protection as well as the Water Management Districts.

In formulating a proposed policy statement, we have reviewed materials from the American Waterworks Association, National Regulatory Research Institute and various industry publications. Based upon our assessment of the rate structure options and knowledge of Florida's water utilities and water resource problems, we have prepared a proposed policy statement which is attached hereto for informational purposes It is Attachment A to this memorandum.

**DISCUSSION OF ISSUES**

**ISSUE 1:** Should this docket be closed?

**RECOMMENDATION:** Yes, the docket should be closed. (VON FOSSEN)

**STAFF ANALYSIS:** This docket was opened as an investigation docket to collect data regarding conservation rate structures. Information has been collected and is presented to the Commission in Attachment A. Our conclusion is that rate structure can be a contributing factor to water conservation provided the rates are based upon cost of service and customers are aware of the rate they are being charged. We further believe that the base facility charge rate structure with a uniform gallonage charge provides a sufficient conservation incentive in most cases. However, we would not preclude consideration of alternate conservation rate structures to combat high consumption specifically for utilities within water resource caution areas or those experiencing high per capita usage.

Based upon the diversity of variables which affect utility costs and water usage within the state, we believe that any change in rate structure should be done in conjunction with a rate proceeding when all variables affecting utility costs and usage can be evaluated. Factors which must be considered for each utility include peak consumption months, average consumption, types of housing, climate, soil type, lot size, customer income level, cost of service, etc. When rate structure is changed in conjunction with a rate proceeding, all variables, including demand elasticity, which affect revenue can be evaluated and rates can be designed specifically for that utility. Additionally, the conservation effect of the allocation of revenue derived from either the base facility or gallonage charges and the resultant impact on revenue stability can be evaluated.

Likewise, wastewater rates should be evaluated on a case by case basis. We believe that basing the rate on water usage as is now done with the base facility charge with a uniform gallonage charge provides an adequate conservation incentive.

We believe that the attached policy statement provides a good overview of conservation rate structures and related issues. However, we also believe that formulation of the Commission's formal policy on such an important issue would require additional discussion and input from the Commissioners. Consideration of this matter at internal affairs or another forum would be beneficial due to the many variables to be considered. Therefore, we recommend that this docket be closed.

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POLICY STATEMENT CONCERNING CONSERVATION RATE STRUCTURES

Water conservation is an area that is at the forefront in Florida. Many people think of Florida as having plenty of water, but the fact is that much of the water requires significant treatment before it is fit for consumption. To a large degree, the problems are caused by population concentration in coastal areas, where the demands are very high and the availability of fresh water supplies is very limited.

The Florida Public Service Commission has concentrated its efforts to promote water conservation on policy coordination with other state regulatory agencies. Until recently, there has been little or no coordination between the different agencies that exercise jurisdiction over the consumption of water and the provision of water and wastewater services to the public.

BACKGROUND

Over the last three years, we have been actively involved in the development of a statewide water conservation plan with the State's five regional water management districts (WMDS) and the Department of Environmental Protection (DEP). Our involvement began in 1989 when Commissioner John T. Herndon served on the NARUC Water Committee and was chairman of a subcommittee on water conservation.

During Govervor Martinez' administration, the Governor appointed a Blue Ribbon Panel to review water supply issues. The panel recommended that the PSC should require conservation rates.

In September, 1990, Rep. C. Fred Jones requested the PSC to review state laws relating to the provision of water service in Florida. He was particularly interested in identifying the respective jurisdictions and authority of local governments, state agencies, community development districts, etc. The PSC response outlined the particular statutes and agencies involved in regulating water in Florida. The conclusion of the report was that the technical expertise exists and the respective agencies recognize the problems, however the current regulatory framework is very fragmented and pluralistic, with no central governing

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authority to develop and promote solutions to environmental problems.

At the encouragement of Commissioner Frank Messersmith and in conjunction with Docket No. 900181-WS, a water conservation workshop was held at the PSC on December 14, 1990. The purpose of the meeting was to establish formal lines of communication between state agencies to discuss our various roles in the regulation of water and wastewater utilities. Approximately 40 people attended including Commissioners Wilson, Messersmith, and Easley, Representative Chuck Smith, Mario Taylor, several staff directors from House and Senate committees interested in water conservation issues, and representatives from DER, the WMDs, and DNR. The primary topics discussed were the need for more coordination among the PSC, DER, and the WMDs in requiring utilities to implement conservation and wastewater reuse measures and conservation rates. There was some discussion of the possibility of the PSC having statewide rate structure jurisdiction over all water utilities to implement conservation rates. However, this idea would only be pursued after improved agency coordination was attempted under the current regulatory framework.

After an initial meeting with the heads of all of the involved agencies, the staff level people were directed to develop formal lines of communication between the agencies to develop a statewide water conservation program. The results of these efforts were Memorandums of Understanding between the PSC and the DER and among the PSC and the five WMDs. The MOUs contain policies and procedures to be followed by the agencies to promote conservation and reuse of reclaimed water. In particular they address DER and the WMDs providing testimony on quality of service at water and wastewater hearings and the PSC's review of reuse feasibility studies for jurisdictional utilities.

The Commission is looking for other ways to promote water conservation through its economic regulation. While the Commission can exert little authority over water supply, we can impact on water demand through both rate structure and rate level. In meetings with DER and the WMDs, staff discussed and developed proposed draft legislation which would give the Commission statewide rate structure jurisdiction over governmentally owned water and wastewater utilities. The goal of the proposal was to give the Commission the authority to review the rate structures to

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insure that they were promoting conservation. However, this proposal generated opposition from cities and counties. Because of the controversy, the proposed legislation was taken out of the Commission's 1993 legislative package and two workshops were held to discuss the rate structure jurisdiction with city and county representatives. At the March 15, 1993 Internal Affairs meeting the staff recommended and the Commission agreed that the legislation should be put on hold until DER and the WMDs showed more support for the initiative.

Within Florida, the WMDs have identified numerous areas as "water resource caution areas". Based upon water source problems of the local aquifers, these areas have been targeted for aggressive water conservation measures. The WMDS have identified conservation rate structures as one of several water conservation measures which they will apply to these problem areas. Since the agency responsible for protecting Florida's water resources has identified problem areas within the state and this Commission is responsible for prescribing rate structures for jurisdictional utilities within these areas, it is imperative that we establish a conservation rate policy in conjunction with Docket No. 900181-WS.

RATE LEVEL

As with other utilities, such as electric and gas, the water and wastewater industry is capital intensive and due to general inflation and environmental concerns, becoming more costly to operate. Many costs such as the costs associated with the additional treatment and testing mandated by the Safe Drinking Water Act and the Clean Water Act will add substantially to the cost of water. However, within our regulatory framework, water and wastewater utilities are unique in that a majority of such systems are developer-owned. Under the developer-owned scenario, the utility is quite often subsidized by other revenue sources of the developer resulting in rates which are well below the actual cost of service. Rates are often kept low to help stimulate real estate sales within developments. This is similar to municipal or county water and wastewater rates which are often low due to cross-subsidization by other revenue sources such as property taxes. In original certificate applications, it has been Commission practice for several years to set rates based upon the projected costs of operating the utility at 80% of capacity. This is done to promote

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conservation and to avoid future rate shock in going from a subsidized to a full cost of service rate. Higher rate levels will have a natural conservation effect.

Water conservation cannot be achieved through rate structure alone. Regardless of which rate structure is utilized, the price signals will be of minimal value if the rate level is low. Alternately, we believe that the rates should reflect the cost of providing service and that any rates which generate revenues in excess of the cost of service should be evaluated with the goal of water conservation. As will be discussed later, we believe that the possibility that a rate may generate excess revenues should not be a deterent to innovative conservation motivated rate design.

RATE STRUCTURE

In order to evaluate the relationship of rate structure, rate level and water conservation, we must first define the term conservation rate structure and the goal of such a rate structure. We believe that a conservation rate structure should reinforce the concept that water is a scarce resource and provide an economic incentive to reduce consumption. We further believe that to be truly in the public interest, conservation should be a continual effort and not just directed at reducing peak demand on a utility system. As policy, we believe lessening annual water withdrawals from Florida's aquifers is the appropriate goal as opposed to only reducing peak demands and associated investment for individual utilities. Therefore, it is important to define conservation rate structures and outline this Commission's policy regarding implementing such rate structures.

A review of the rate structures of Commission regulated utilities shows quite a diversity. This diversity is due to the grandfathering of existing rates when utilities first come under the Commission's jurisdiction. However, the predominant rate structure is the base facility charge with a uniform gallonage charge. This rate structure has been the Commission's structure of choice since approximately 1980. The rate is easily billed and explained, and by being usage sensitive provides the desired conservation incentive through the price signal that the more you use, the more you pay. We believe that for any rate structure to promote conservation, the customer must be faced with either a

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constant or rising cost for the next unit consumed. The Commission has actively moved to eliminate rate structures which do not meet these criteria, such as; flat rates, declining block rates or minimum charge rates (wherein water consumption is included within a minimum charge), in favor of a base facility charge rate with a uniform gallonage charge. The Commission has also approved inverted rates for several utilities under its jurisdiction.

Another rate issue, regardless of the chosen rate structure, is a determination of the allocation of the revenue to be derived from either the base facility or gallonage charge and among the various classes of customers. Since the base charge is not affected by usage, its level will not impact on conservation. Therefore, conservation price signals are only given through the gallonage charge. Higher gallonage charges should be more effective in promoting conservation. However, with a given revenue requirement, increasing the gallonage charge will lessen the base charge which will impact upon the revenue stability of the utility. Generally, fixed costs are included in the base facility charge and variable costs and return on investment are covered by the gallonage charge. Therefore, if fixed costs are shifted to the gallonage charge and the increased gallonage charge results in water conservation, a revenue deficiency could result. Obviously, a trade-off exists between revenue stability and conservation, which is yet another variable to be considered in changing rate level or rate structure.

We believe that rate structure can be a supporting tool in combatting excessive consumption within "water resource caution areas" or to address specific problems for a given utility. As previously noted, we believe that the base facility charge rate structure with a uniform gallonage charge is a sufficient conservation rate structure in most instances. However, this would not preclude consideration of alternate rate structures on a case by case basis within "water resource caution areas" or to target a utility with excessive water use.

ALTERNATE WATER CONSERVATION RATES

**Price Elasticity of Water Demand**

Essential to the effectiveness of any conservation rate is the customer's change in water usage in response to a change in price.

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This response is measured by the price elasticity of demand which is more specifically defined as the percentage change in quantity consumed in response to a percentage change in price. Estimation of price elasticity is needed to forecast demand and project revenue associated with any change in rate level or rate structure.

However, elasticity is not easily calculated due to the interaction of variables other than price. Factors such as customer income levels, weather, and fundamental versus irrigation

water needs impact upon demand elasticity. Due to the complexity of determining demand elasticity, the Southwest Florida Water Management District has contracted a consultant to develop a model to measure elasticity based upon district specific variables. Staff will closely follow this study as it relates to our jurisdictional utilities.

**Marginal Cost Pricing**

Prior to discussing rate structures, a brief discussion is needed regarding marginal cost pricing. Marginal cost is defined as the additional cost of producing or selling an additional unit. Economic theory argues that pricing resources at marginal cost will help ensure an efficient allocation. The two components of marginal cost would be a change in operating costs based upon a change in utilization of existing capacity and the costs associated with any capacity expansion. Historically, rates have been based upon embedded accounting costs. However, in calculating marginal costs, demand must be forecasted and the operating and capacity costs to meet such demand must be projected. While the theory of marginal cost pricing is sound, there are problems in applying the theory to the water and wastewater industry. The main problems are revenue instability and converting the cost estimates into actual rates.

The relationship between average cost and marginal cost can result in either insufficient or excess revenues. If average cost is less than marginal cost, excess revenues will occur. If average cost exceeds marginal cost, insufficient revenues will occur. While designing rates to generate a given revenue requirement has long been a regulatory problem, the concern becomes exaggerated when costs and demands are projected. While insufficient revenues

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can be addressed by a revenue stabilization fund and excess revenues can be applied to other conservation programs, we believe that, due to the intricacies of developing marginal cost rates and the fact that most Commission regulated utilities are small and built in a single phase of capacity, marginal cost pricing is not a practical rate making option at this time.

**Inverted or Inclining Block Rates**

Under this rate structure, the per-unit price of water increases as the customer enters the higher priced blocks. Therefore, the incentive to conserve increases with greater consumption. This structure does not recognize that the average cost of water decreases with the volume used and does not recognize the good load factor of large industrial or commercial customers. Therefore, the rate may best be applied only to residential customers. Since the rate is not based upon cost of service, problems exist in determining the number of blocks in the rate, the size of the blocks and the price of each block. For example, if a utility's residential customers average 10,000 gallons per month and the first block of the rate was for usage from 0-15,000 gallons, many customers would not enter the higher price block and the impact of the rate would be minimal on overall conservation. Also the price differential between the blocks must be significant. If the first block were to be priced at $1.00 per 1,000 gallons and the second block were to be priced at $1.15, customers would view the differential as insignificant and not alter their consumption. Care must be taken to develop the rate on a utility by utility basis. Additionally, to determine revenue to be generated by the change to an inverted rate, a demand elasticity must be used to determine billing determinants. This rate would appear to be a good option for combatting high per capita usage.

**Seasonal Rates**

Many proponents of marginal cost pricing advocate seasonal rates in that they vary from annual average cost and attempt to reflect time differentiated pricing based upon peak and off-peak usage. While the rates recognize cost differentials based upon when usage occurs, the cost may be either historic or projected. There are essentially two forms of seasonal rates, the peak/off-peak rate and a rate with an excess use charge.

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Under the peak/off-peak rate, all usage during the peak period is priced at a higher rate than off-peak usage. Utilities

considering this option should have capacity which is peak driven and such peak should show a substantial variation from off-peak usage. The rate is easily billed and understood by customers and the higher rate during peak months should encourage conservation. However, revenue stability may be a problem in that a majority of revenue is received during the peak period based upon higher usage at the higher rate. Should usage be higher or lower than anticipated, revenues can drastically vary from the revenue requirement.

A more sophisticated version of the above rate is the excess usage rate which is, in effect, an inverted rate during the peak months. Under this rate, a customer's average per billing period off peak usage is calculated. Customers then pay a higher rate for usage in excess of that average during the peak period. This structure is superior to the peak/off-peak rate for cost recovery but is more difficult to determine costs and design. Further, customer acceptance and understanding of the rate can be a problem.

**Imputed Cost Of Raw Water**

As previously noted, water usage should decrease as price increases. Therefore, any increase in the cost of water can be viewed as a conservation factor. Some parties have advocated that there be a cost associated with the withdrawal of water from the aquifers in addition to the costs of treatment and distribution. The basis of the theory is that water is one of the state's scarce natural resources. As usage depletes this resource, customers should pay for such depletion. Conceptually, this charge, which might be for example 10 cents per thousand gallons, would be collected by the utilities and passed on to a governmental agency which would distribute the funds for water related uses.

WASTEWATER AND RECLAIMED WATER RATES

While the primary focus of this discussion has been on water rates, it is important to mention rates for both wastewater service and reclaimed water.

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For wastewater, we believe that a base facility charge rate structure with a uniform gallonage charge based upon water usage

provides an additional incentive to conserve water. Traditionally, the commission has utilized a cap on the residential wastewater rate whereby the wastewater gallonage charge would only apply to the average level of water consumption for indoor use. Since the wastewater rate is based upon water usage, the intent of the cap on wastewater bills for residential customers is to recognize that not all water used is returned to the wastewater system. Either extending the level of the cap or totally eliminating the cap would increase the incentive for conservation by increasing the wastewater charge based upon water usage.

Something we are starting to see develop is a regulatory scheme in which the Commission sets rates for reclaimed and other nonpotable water, in addition to our authority to set rates for traditional water and wastewater services. Regulating the sale of these new products brings about a difficult set of issues unique to the water and wastewater industry. Economic regulatory agencies face the problem of allowing a reasonable recovery of the utility's investment without discouraging potential customers, such as golf courses, from abandoning their existing irrigation wells and accepting reclaimed water. This is where joint cooperation of the economic and environmental regulators is essential in achieving a reasonable balance between the goal of water conservation and reasonable rates. PSC staff worked closely with DER and the WMDs in 1991 to develop criteria for feasibility studies which will be used to study the technical and economic feasibility of reuse of reclaimed water. The MOU sets procedures for PSC staff to review feasibility studies for jurisdictional utilities.

A good example of a new concept that our Commission is currently reviewing is the sharing of utility investment related to water conservation or reuse of reclaimed water between the water customers, the wastewater customers, and the reclaimed water customers. This particular situation is most easily approached when these services are provided by one entity to the same body of customers. By utilizing the lower quality reclaimed water for irrigation, high quality water in the aquifer is preserved for drinking water. According to this cost sharing theory, the justification for sharing the cost of the additional investment for reuse between the potable water customers, the wastewater

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customers, and the reclaimed water customers is that everyone benefits by preservation of the aquifer.

Based on some practical experience in this area, we believe that the proper price for reclaimed water may range anywhere from being "free" to costing $.75 per 1,000 gallons based on a fully allocated cost. Because of the peculiarities of each case, each situation must be evaluated on a case-by-case basis; however, the most important aspect to making reclaimed water economically and environmentally feasible is that there be a joint effort on the part of the economic regulator and the environmental agencies.

CUSTOMER EDUCATION

Important to this discussion is recognition that rate structure is only one tool in achieving overall water conservation. In order for a rate structure to provide price signals which will promote conservation, customers must be educated as to the need for conservation and be aware of their water usage and the price for such usage. Customers must be made aware that water is no longer an abundant and virtually free resource and that the cost of providing potable water will continue to rise. The utility's rate should be clearly stated on the bill along with the consumption for the instant billing period and for comparative purposes for the same period for the previous year. For rate structures and rate levels to be fully recognized, monthly billing is recommended in lieu of either bi-monthly or quarterly billing.

As previously noted, some rate levels and rate structures may lead to excess revenues. We do not believe that any rate structure should be discarded based upon the fact that it may generate excess revenues. Dependent on the level of the excess and the individual utility, this revenue could be used for customer education or implementation of other conservation programs. Since the excess revenue would be collected in the name of conservation, it is proper that these funds be used for conservation related issues.

For example, a larger utility may use some of these funds to implement a leak detection program or generate system specific pamphlets for its customers. Alternatively, the utility may retain none of these funds with all going to a statewide conservation fund. This fund could be used for a statewide conservation education campaign or for interest free loans or grants to small

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utilities for conservation measures such as installing meters formetered billing. There are numerous water conservation oriented uses for any funds generated through excess revenues. Important to

the implementation of conservation rates is recognition that excess revenues can in effect be reinvested in the conservation effort.

MASTER METERING

Master metering, as with flat rates, makes the end user of water service unaware of his water usage and without any price incentive to conserve. Under a master metering scenario, which is usually a mobile home park, apartment or office building, the landlord receives one water bill for the property and includes this expense as an operating cost which is included in rental charges or maintenance fees. The tenants view water service as included in the rent as a fixed charge regardless of usage. This situation in fact encourages water use.

Since the end user is receiving water service under a flat rate which the Commission has been actively moving to eliminate, we support all efforts to eliminate master metering in either existing or new facilities.

CONCLUSION

We believe that rate structure can be a contributing factor to water conservation provided the rates are based upon cost of service and customers are aware of the rate they are being charged. We further believe that the base facility charge rate structure with a uniform gallonage charge provides a sufficient conservation incentive in most cases. However, we would not preclude consideration of alternate conservation rate structures to combat high consumption specifically for utilities within water resource caution areas or those experiencing high per capita usage.

Based upon the diversity of variables which affect utility costs and water usage within the state, we believe that any change in rate structure should be done in conjunction with a rate proceeding when all variables affecting utility costs and usage can be evaluated. Factors which must be considered for each utility include peak consumption months, average consumption, types of

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