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May 17, 1993

**Hand-Deliver**

Mr. Steve Tribble, Director
Division of Records and Reporting
Florida Public Service Commission
101 East Gaines Street
Tallahassee, FL 32399-0850

RE: Docket No. 911082-WS
Proposed Revision of PSC Water and Wastewater Rules

Dear Mr. Tribble:

Enclosed for filing on behalf of the Florida Waterworks Association in the above docket are an original and fifteen copies of the following:

Supplemental Comments of Robert P. Todd and James A. Perry

Please acknowledge receipt of the foregoing by stamping the enclosed extra copy of this letter and returning same to my attention. Thank you for your assistance.

Sincerely,

Wayne L. Schiefelbein

Wayne L. Schiefelbein

WLS/meg
Enclosures

cc: All interested persons listed
on the FPSC docket mailing list

ACK ✓
AFA 1
APP 1
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LEG 1
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DOCKET NO. 911082-WS

SUPPLEMENTAL COMMENTS

OF

ROBERT P. TODD AND JAMES A. PERRY

ON BEHALF OF THE

FLORIDA WATERWORKS ASSOCIATION

**Rule 25-30.432 Used and Useful in Rate Case Proceedings:**

The Florida Waterworks Association objects to the formulae offered by OPC to calculate the used and useful percentage of water transmission systems, water distribution systems, wastewater collection systems and wastewater force mains. The basis of the objection is two fold.

First it is nearly impossible to calculate how much water can flow through a pipe as it is a function of the size of the pipe, the pressure at which the fluid is being pumped at, or in the case of wastewater gravity systems the angle of the pipe, the friction between the pipe surface and the fluid, the material the pipe is made of, the geometry of the system as installed and the location and volume of competing uses of the fluid, among others. Further prudent design requires pipes to be sized to handle peak flow plus fire flow.

The second reason the FWWA objects to the use of OPC's simplistic linear equations to estimate the used and useful portion of a pipe is they ignore the physics of fluid flow, and the economics of construction and for those reasons are an inaccurate model. Because pipe is circular the maximum potential flow at any given pressure is calculated by using an equation which is a combination of an exponential and a geometric expression. In other words, the surface area of a circle is calculated by multiplying Pi times the radius of the pipe squared. The effect of this on the maximum volume of water a pipe can transport and the installation cost per foot of pipe are summarized below.

| PIPE DIAMETER | | SURFACE AREA | COST PER FOOT |
|---|---|---|---|
| 6" pipe | 3.14 x 3 x 3 = | 28.26 square inches | $9.00/foot |
| 8" pipe | 3.14 x 4 x 4 = | 50.24 square inches | $10.00/foot |
| 10" pipe | 3.14 x 5 x 5 = | 78.50 square inches | $13.00/foot |
| 12" pipe | 3.14 x 6 x 6 = | 113.04 square inches | $17.50/foot |

At any given pressure if all other factors affecting the volume that a pipe can transport are held constant an 8 inch pipe can transport 78% more water than a 6 inch pipe, yet the cost of installation is only 11% higher because the significant majority of the cost of pipe construction is labor and machinery, not materials. The impact of this is demonstrated in the table below. This calculations in this table assume that a 5,000 foot six inch pipe can provide exactly 100% of the water required by the current customers of a utility and demonstrates the effect of OPC's recommended formulae on rate base if larger pipes are installed.

| PIPE DIAMETER | FEET OF PIPE | $/FOOT | TOTAL COST | SQUARE INCHES | OPC's USED AND USEFUL % | RATE BASE |
|---|---|---|---|---|---|---|
| 6 inch | 5,000 | $9.00 | $45,000 | 28.26 | 100.00% | $45,000 |
| 8 inch | 5,000 | $10.00 | $50,000 | 50.24 | 56.25% | $28,125 |
| 10 inch | 5,000 | $13.00 | $65,000 | 78.50 | 36.00% | $23,400 |
| 12 inch | 5,000 | $17.50 | $87,500 | 113.04 | 25.00% | $21,875 |