COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF SOUTHERN MADISON WATER DISTRICT FOR CERTIFICATE OF CONVENIENCE AND NECESSITY TO COMPLETE CONSTRUCTION OF STORAGE FACILITIES	)))))	CASE NO. 92-161

O R D E R

On April 6, 1992, Southern Madison Water District ("Southern Madison") filed an application for a Certificate of Public Convenience and Necessity to construct a $26,000 water works improvement project. The proposed project would construct a pump station to fill the recently constructed 90,000-gallon water storage tank on Dogwood Drive. Southern Madison has stated that it has discovered that the tank cannot be filled with the existing pump station.

In Case No. 9596[1] Southern Madison was ordered by the Commission on August 14, 1986 to construct two hydropneumatic stations. The installation of the two hydropneumatic stations was

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1 Case No. 9596, Application of the Southern Madison Water District, a Water District Organized Pursuant to Chapter 74 of the Kentucky Revised Statutes, of Madison County, Kentucky for (I) Approval of the Adjustment of Water Rates Proposed to be Charged by the District to Customers of the District, (II) A Certificate of Public Convenience and Necessity, Authorizing and Permitting Said Water District to Construct an Extension to its Waterworks Distribution System; and (III) Approval of the Proposed Plan of Financing of Said Improvements and Extension of Said Waterworks Distribution System.

to solve two low-pressure problem areas. On August 20, 1991, Southern Madison filed a motion to hold in abeyance that portion of the Order entered August 14, 1986 which required the installation of the two hydropneumatic stations. In defense of its motion, Southern Madison contended that the construction of the Dogwood Drive water storage tank would solve the low-pressure problems and make the installation of the two hydropneumatic stations unnecessary. However, Southern Madison did not present persuasive evidence that the tank construction would eliminate the need for the two hydropneumatic stations. In order for Southern Madison to have time to determine whether the tank construction had eliminated the need for the hydropneumatic stations, the Commission by Order entered November 1, 1991 held that portion of the August 14, 1986 Order in abeyance for one year. This same Order also required Southern Madison, to "file such data with the Commission as will enable the Commission to determine whether the hydropneumatic stations are no longer necessary, including a complete, thorough calibrated hydraulic analysis of the existing water distribution system as presently constructed, documented by field measurements." This information is to be filed with the Commission by November 31, 1992.

By letter filed with the Commission on January 22, 1992, Southern Madison indicated that the Dogwood Drive water storage tank cannot solve the low-pressure problems without the construction of the pump station proposed in this case.

Based on this information, if Southern Madison has determined that additional construction is necessary to eliminate the need

for the hydropneumatic stations, the information which was required to be filed by November 31, 1992 should be filed now.

IT IS THEREFORE ORDERED that Southern Madison shall file an original and 10 copies (two copies of engineering-related materials) of the following information with the Commission, with a copy to all parties of record within 14 days from the date of this Order. If the information cannot be provided by this date, Southern Madison should submit a motion for an extension of time stating the reason for which a delay is necessary and include a date by which it will be furnished. Such motion will be considered by the Commission. Southern Madison shall furnish with each response the name of the witness who will be available at the public hearing for responding to questions concerning each item of information requested.

1. If the hydraulic analyses, which are provided in response to this information request are computer-generated, provide a copy of the input data on an IBM compatible 5 1/4-inch or 3 1/2-inch floppy disk.

2. Provide hydraulic analyses, supported by computations and actual field measurements, of typical operational sequences of the existing water distribution system as presently configured and operated. These hydraulic analyses should demonstrate the operation of all pump stations and the "empty-fill" cycle of all water storage tanks. Computations are to be documented by a labeled schematic map of the system that shows pipeline sizes, lengths, connections, pumps, water storage tanks, wells, and sea level elevations of key points, as well as allocations of actual

customer demands. Flows used in the analyses shall be identified as to whether they are based on average instantaneous flows, peak instantaneous flows, or any combination or variation thereof. The flows used in the analyses shall be documented by actual field measurements and customer use records. Justify fully any assumptions used in the analyses.

3. Provide a summary of any operational deficiencies of the existing water system that are indicated by the hydraulic analyses or that are known from experience.

4. In order to obtain realistic results when utilizing computer hydraulic analyses to predict a water distribution system's performance, engineering references stress the importance of calibrating the results predicted to actual hydraulic conditions. This calibration process should include matching field measurements to the results predicted by the computer over a wide range of actual operating conditions. At a minimum this should include average and maximum water consumption periods, as well as "fire flow" situations and very high demand periods.

Based on the above, explain the procedures used to verify the computer hydraulic analyses filed in this case. This explanation should be documented by field measurements, hydraulic calculations, etc.

Most engineering references state that instantaneous customer demands can peak at 3 to 15 times the 24-hour average demand. In addition, most engineering references also state that a water distribution system should be designed to meet at least the maximum hourly demand of its customers.

Based on the above information, state exactly what measurements were made of Southern Madison's maximum hourly usage. If the maximum hourly usage was not measured directly, state why it was not.

In addition, state exactly how the diurnal pattern for Southern Madison's system was determined. Also detail how the diurnal demand multipliers for any hydraulic analyses were determined. This response should be documented by appropriate field measurements.

a. Provide a pressure recording chart showing the actual 24-hour continuously measured pressure available at the locations listed below on Southern Madison's system. Identify the 24-hour period recorded, the exact location of the pressure recorder, and the sea level elevation of the recorder. Also state the schematic junction number nearest the location of the pressure recorder.

b. In the vicinity of any water storage tanks.

c. On the suction and discharge sides of all pump stations.

d. On both sides of any pressure reducing valves.

e. In the vicinity of the proposed pump station.

f. Any other locations necessary to provide a complete understanding of the existing system operation.

5. Provide a narrative description of the proposed daily operational sequences of the water system. Documentation should include the methods and mechanisms proposed to provide positive control of all storage tank water levels. The description should

also include an hourly summary of how all tanks (existing and proposed) will "work" (expected inflow or outflow of water) and how all pumps will function. The description should be fully supported by appropriate field measurements and hydraulic calculations.

6. Provide a highway map at a scale of at least one inch equals two miles marked to show Southern Madison's water distribution system. The map of the system shall show pipeline sizes, location, and connections as well as pumps, water storage tanks, and sea level elevations of key points.

7. Provide a list of each of Southern Madison's existing pump stations. Give the location, number of pumps and their rated capacities, and the purpose of each pump station. Explain how the operation of each pump station is controlled. Provide a copy of the pump manufacturer's characteristic (head/capacity) curve for each of Southern Madison's existing pumps. Identify each curve as to the particular pump and pump station to which it applies. Also state if pump is in use, will remain in use, will be abandoned, or will be replaced. If any pumps have been modified or renovated since the original installation, provide a brief history as well as current operating information.

8. Provide the daily master meter readings for the most recent month. Also provide the total monthly water sales and purchases for each of the last 12 months.

9. Provide hydraulic analyses, supported by computations and actual field measurements, of typical operational sequences of the water distribution system with the improvements proposed in

this case in place. These hydraulic analyses should demonstrate the operation of all pump stations and the "empty-fill" cycle of all water storage tanks. Computations are to be documented by a labeled schematic map of the system that shows pipeline sizes, lengths, connections, pumps, water storage tanks, wells, and sea level elevations of key points, as well as allocations of actual customer demands. Flows used in the analyses shall be identified as to whether they are based on average instantaneous flows, peak instantaneous flows, or any combination or variation thereof. The flows used in the analyses shall be documented by actual field measurements and customer use records. Justify fully any assumptions used in the analyses. (Note - these analyses should use the same schematic as the analyses of the existing water distribution system to facilitate comparison.)

Done at Frankfort, Kentucky, this 30th day of April, 1992.

PUBLIC SERVICE COMMISSION

For the Commission

ATTEST:

Executive Director, Acting