COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE APPLICATION OF THE CHRISTIAN COUNTY WATER DISTRICT OF CHRISTIAN COUNTY, KENTUCKY, FOR APPROVAL OF RELOCATION AND RESTORATION OF WATER STORAGE TANK	)))))	CASE NO. 9986

O R D E R

IT IS ORDERED that Christian County Water District ("Christian County") shall file an original and seven copies of the following information with the Commission with a copy to all parties of record no later than August 28, 1987. If the information cannot be provided by this date, Christian County should submit a motion for an extension of time stating the reason a delay is necessary and include a date by which it will be furnished. Such motion will be considered by the Commission. Christian County 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. Christian County did not file hydraulic analyses for the existing water distribution system with its application. Based on this, provide hydraulic analyses, supported by computations and actual field measurements, of typical operational sequences of the existing water distribution system. 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.

2. 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.

3. Christian County filed a hydraulic analysis for the proposed water distribution system with its application. This analysis depicted a tank full scenario. Unfortunately this analysis did not depict the "on-off" operation of the existing pump, the "empty-fill" cycles of the proposed tank, etc. Based on this, provide hydraulic analyses, supported by computations and actual field measurements, of typical operational sequences of the proposed water distribution system. These hydraulic analyses should demonstrate the operation of all pump stations and the "empty-fill" cycle of all water storage tanks as well as residual pressures at representative points throughout the system. 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.

4. In order to obtain realistic results when utilizing 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 analyses over a wide range of actual operating conditions. As a minimum this should include average and maximum water consumption periods, as well as "fire flow" or very high demand periods.

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

5. 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 Christian County's maximum hourly usage. If the maximum hourly usage was not measured directly, state why it was not.

In addition, state how the demand patterns for Christian County's system were determined. This response should be documented by appropriate field measurements.

6. Provide a pressure recording chart showing the actual 24-hour continuously measured pressure available at the locations listed below on Christian County'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.

a. The water line in the vicinity of the connection point to the City of Hopkinsville.

b. The water line in the vicinity of the proposed tank location.

c. The water line at the sale point to the Pennyrile State Resort Park.

d. On the suction and discharge sides of pump station No. 3.

7. Provide information concerning Christian County's existing pump station No. 3. Give the location, number of pumps and their rated capacities; and the purpose of the pump station. Explain how the operation of the pump station is controlled. Provide a copy of the pump manufacturer's characteristic

(head/capacity) curve for pump station No. 3. Also state if pump is in use and if pump will remain in use, will be abandoned or will be replaced.

8. Provide the criteria used in determining the location, size, overflow elevation, and head range for the proposed water storage tank. In addition, state what other sites were considered and why they were not selected.

9. 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 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.

10. The engineering information submitted with the application indicates that Christian County is proposing to install 1 fire hydrant as part of this project. Kentucky Revised Statutes ("KRS") Chapter 227, the "Recommended Standards For Water Works" by the Great Lakes - Upper Mississippi River Board of State Sanitary Engineers ("Ten States Standards") and the Insurance Services Office ("ISO") all have requirements for providing fire protection. All of these references require fire hydrant installation on a minimum of 6-inch diameter water lines. The ISO requires the capability to deliver at least 250 gallons per minute at a residual pressure of 20 pounds per square inch for a minimum of 2 hours from any fire hydrant. Based on the above, provide

information as to the purpose of the proposed fire hydrant. If the purpose of the proposed fire hydrant is to provide fire protection, provide hydraulic analyses demonstrating the capability of Christian County's system to comply with the requirements of KRS Chapter 227, the ISO and the Ten States Standards. If the fire hydrant is proposed for reasons other than fire protection state why other equipment was not considered (e.g. blow-off valves, drain valves, etc.).

11. The application states that the proposed construction project is to be financed with $109,607 from Christian County's Depreciation Fund and $50,000 from a local bank. Based on this information, provide the actual source for the Depreciation Fund (e.g., Temporary Cash Investments, etc.). In addition, provide documentation from the appropriate bank outlining its willingness to loan money to Christian County and the terms (interest rate, length) for any proposed borrowing.

Done at Frankfort, Kentucky, this 17th day of August, 1987.

PUBLIC SERVICE COMMISSION

Richard D. Heman Jr.
For the Commission

ATTEST:

Executive Director