COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE APPLICATION OF BEAVER-ELKHORN WATER DISTRICT FOR (1) CERTIFICATE OF PUBLIC CONVENIENCE AND NECESSITY - CONSTRUCTION - TO UPGRADE WATER TREATMENT PLANT/WATER LINE EXTENSIONS PURSUANT TO KRS 278.020(1); (2) AUTHORIZATION OF BORROWING FROM THE COMMONWEALTH OF KENTUCKY, KENTUCKY INFRASTRUCTURE AUTHORITY WATER RESOURCES LOAN FUND PURSUANT TO KRS 278.300; (3) AUTHORITY TO INCREASE RATES PURSUANT TO 807 KAR 5:001, SECTION 10	)	CASE NO. 92-129

O R D E R

IT IS ORDERED that Beaver-Elkhorn Water District ("Beaver-Elkhorn") shall file an original and one copy of the following information with the Commission, with a copy to all parties of record by May 15, 1992. If the information cannot be provided by this date, Beaver-Elkhorn 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. Beaver-Elkhorn 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 shall 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, 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 shall use the same schematic as the analyses of the proposed water distribution system to facilitate comparison.)

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. Provide hydraulic analyses, supported by computations and actual field measurements, of typical operational sequences of the proposed water distribution system. These hydraulic analyses shall 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, 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 shall use the same schematic as the analyses of the existing water distribution system to facilitate comparison.)

5. 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 shall 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 shall be documented by field measurements, hydraulic calculations, etc.

6. 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 Beaver-Elkhorn'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 Beaver-Elkhorn's system was determined. Also detail how the diurnal demand multipliers for the computer model were determined. This response shall be documented by appropriate field measurements.

7. Provide a pressure recording chart showing the actual 24-hour continuously measured pressure available that is taken simultaneously at the locations listed below on Beaver-Elkhorn'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. In the vicinity of the proposed tank sites.

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

c. At or near all existing tank sites and several representative points throughout the water distribution system.

8. Provide a list of Beaver-Elkhorn's water storage tanks. Give the location, capacity, and overflow elevation of each tank. Explain how water is supplied to each tank.

9. Provide a list of Beaver-Elkhorn'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 Beaver-Elkhorn'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.

10. Provide a copy of the pump manufacturer's characteristic (head/capacity) curve on which the design of the proposed pump stations are based.

11. Provide the criteria used in determining the location, size, overflow elevation, and head range for the proposed water storage tanks. Provide detailed information on how the sea level elevation for the proposed tank sites was determined. Identify the particular methods and specific vertical datum and bench marks used in this effort. In addition, state what other sites were considered and why they were not selected.

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

supported by appropriate field measurements and hydraulic calculations.

13. Provide a highway map at a scale of at least one inch equals two miles marked to show Beaver-Elkhorn'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.

14. Provide a copy of the approval letter from the Natural Resources and Environmental Protection Cabinet for the proposed construction.

15. Provide a copy of the preliminary engineering report.

16. Provide a copy of the bid tabulation whenever the bids are received.

17. Provide a copy of the final summation of the total cost of construction and funding arrangements referred to as Final Engineering Report after the bids are received.

18. The engineering information submitted with the application indicates that Beaver Elkhorn is proposing to install 48 fire hydrants as part of this project. 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 six-inch diameter water lines. For residential construction, the ISO requires the capability to deliver between 500 to 1500 gallons per minute at a residual pressure of 20 pounds per square inch for

a minimum of 2 hours from any fire hydrant. The Ten States Standards allow a fire hydrant on dead-end mains for flushing only if flow and pressure are sufficient. Otherwise an approved flushing hydrant or blow-off valve should be used. Based on the above, provide information as to the purpose of the proposed fire hydrants. If the purpose of the proposed fire hydrants is to provide fire protection, provide hydraulic analyses demonstrating the capability of Beaver-Elkhorn's system to comply with the requirements of KRS Chapter 227, the ISO, and the Ten States Standards. If the fire hydrants are proposed for reasons other than fire protection, state why other equipment was not considered (e.g., blow-off valves, drain valves, etc.).

19. KRS 322.340 for registered engineers states "Plans, specifications, plats and reports approved by a registrant shall be signed and dated by the registrant and stamped with the seal when filed with public authorities."

Provide appropriate documents which comply with KRS 322.340 or, in the alternative, the documents on file in this case may be signed, sealed, and dated by the registered engineer.

20. Provide information showing how the formulas used in calculating the billing analysis were determinmed.

Done at Frankfort, Kentucky, this 29th day of April, 1992.

ATTEST:

Executive Director, Acting

PUBLIC SERVICE COMMISSION

For the Commission