COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE APPLICATION OF HENRY COUNTY WATER DISTRICT NO 2, OF HENRY, TRIMBLE, CARROLL, OLDHAM, AND SHELBY COUNTIES, KENTUCKY, FOR APPROVAL OF CONSTRUCTION, FINANCING AND INCREASED WATER RATES	)	CASE NO. 9920

O R D E R

IT IS ORDERED that Henry County Water District No. 2 ("District No. 2") shall file an original and one copy of the following information with the Commission with a copy to all parties of record no later than July 1, 1987. If the information cannot be provided by this date, District No. 2 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. District No. 2 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. 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.

2. Provide a map of suitable scale labeled to show District No. 2's boundaries.

3. The map provided for the computer analyses between the wells and treatment plant does not match with the computer runs. Provide a schematic map that is compatible with the computer analyses. In addition, clarify the number of existing and proposed high service pumps at the treatment plant. Also clarify the size of the proposed pipeline between proposed wells and treatment plant (computer analyses show 12-inch diameter pipes while construction calls for 18-inch diameter pipe).

4. Provide an explanation of how you have arrived at the average and maximum demands for District No. 2's system. Also provide a detailed explanation of how the demand at junction 39 was determined to be six gallons per minute.

5. District No. 2 needs to provide computer hydraulic analyses for the existing water distribution system. These analyses should depict the "on-off" operation of the existing pumps, the "empty-fill" cycles of the existing tanks and actual customer demands, and should be supported by computations and actual field measurements, of typical operational sequences of the existing water distribution 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. (Note - these analyses should use a schematic compatible to the one used for the analyses of the proposed water distribution system to facilitate comparison).

6. District No. 2 filed computer hydraulic analyses for the proposed water distribution system with its application. One analysis depicted several different demand patterns for the distribution system. In addition to showing pressures above the 150 p.s.i.g. allowed by Commission regulation, the computations showed impossible negative pressures at several junctions. This analysis did not depict the "on-off" operation of the existing or proposed pump, the "empty-fill" cycles of the existing or proposed tanks, etc. Another analysis depicted a 12-hour simulation with the "on-off" operation of the proposed pump and the "empty-fill" cycles of the existing and proposed tanks but did not depict residual pressures at representative points throughout the system. There is a message on the simulation run that says, "system terminated due to an error or user instruction." In light of the above, 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 "on-off" 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. (Note - these analyses should use a schematic compatible to the one used for the analyses of the existing water distribution system to facilitate comparison).

7. 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. 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 computer hydraulic analyses filed in this case. This explanation should be documented by field measurements, hydraulic calculations, etc.

8. Provide a pressure recording chart showing the actual 24-hour continuously measured pressure available at the locations listed below on District No. 2'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 storage tank in the vicinity of junction 14 (T-7).

b. The water storage tank in the vicinity of junction 19 (T-1).

c. The water storage tank in the vicinity of junction 49 (T-2).

d. The water storage tank in the vicinity of junction 27 (T-3).

e. The water storage tank in the vicinity of junction 35 (T-4).

f. The water storage tank in the vicinity of junction 67 (T-5).

g. The water storage tank in the vicinity of junction 68 (T-6).

h. The water storage tank in the vicinity of junction 55 (T-8).

i. The water storage tank in the vicinity of junction 63 (T-9).

j. On the suction and discharge sides of all pumps in District No. 2's total system.

k. Water lines in the vicinity of junctions 21, 26, 29, 33, 36, 39, 41, 45, 50, 54, 60, and 66.

9. Provide a list of each of District No. 2's water storage tanks. Give the location, capacity, and overflow elevation of

each tank. Explain how water is supplied to each tank and how the water level in each storage tank is controlled.

10. Provide a list of each of District No. 2'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 District No. 2'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 and if pump will remain in use, will be abandoned or will be replaced.

11. Provide a copy of the pump manufacturer's characteristic (head/capacity) curve on which the design of the proposed pump station was based.

12. What tests have been conducted to determine the maximum and sustained yield of the existing wells and proposed well? Provide the capacity for each existing well and the proposed well. Explain how the capacities were determined and provide specific data on any drawdown and recovery tests conducted.

13. Provide the criteria used in determining the location, size, overflow elevation and head range for the proposed water storage tanks. Explain the purpose of the proposed 300,000-gallon ground storage tank at the plant site.

14. 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.

Done at Frankfort, Kentucky, this 2nd day of June, 1987.

PUBLIC SERVICE COMMISSION

For the Commission

ATTEST:

Executive Director