

COMMONWEALTH OF KENTUCKY  
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

THE APPLICATION OF WESTERN LEWIS- )  
RECTORVILLE WATER DISTRICT, MASON )  
AND LEWIS COUNTIES, KENTUCKY, (1) )  
FOR A CERTIFICATE OF PUBLIC CON- )  
VENIENCE AND NECESSITY AUTHORIZING )  
SAID DISTRICT TO CONSTRUCT MAJOR )  
WATER SYSTEM ADDITIONS PURSUANT TO )  
THE PROVISIONS OF CHAPTER 74 OF THE )  
KENTUCKY REVISED STATUTES; (2) )  
SEEKING APPROVAL OF WATER SERVICE )  
RATES AND CHARGES WITH RESPECT TO )  
SUCH ADDITIONS; AND (3) SEEKING )  
APPROVAL OF THE ISSUANCE OF CERTAIN )  
SECURITIES )

CASE NO. 9948

O R D E R

IT IS ORDERED that Western Lewis-Rectorville Water District ("Western Lewis-Rectorville") 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 21, 1987. If the information cannot be provided by this date, Western Lewis-Rectorville 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. Western Lewis-Rectorville 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. The hydraulic information and the final plans and specifications for this project which pertain to the existing and

proposed pump stations are somewhat confusing. The specifications require a pump capable of delivering 1.13 gallons per minute when operating at 132 feet of head to be installed on Highway 57. The plans do not depict a location for a new pump station. The specifications also mention upgrading the existing high service pump but no details are given. In addition the computer hydraulic analyses for the proposed water distribution system do not depict a second pump in operation. The analyses also utilize a slightly different pump curve for the existing high service pump. Based on this provide clarification concerning the disposition of both the existing and proposed pump stations. This clarification should include any appropriate changes to the specifications and plans, the manufacturer's pump characteristic curves for the existing and proposed pumps and a revised hydraulic analysis of the proposed system if necessary. If a revised hydraulic analysis is necessary for clarification 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. (Note - these analyses should use the same schematic as the analyses of the existing water distribution system to facilitate comparison.)

2. 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.

3. The computer hydraulic analyses filed in this case are based on a diurnal customer demand pattern varying from .14 times the initial demand to 3.0 times the initial demand. It is assumed that the initial demand is the average demand.

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 Western Lewis-Rectorville's maximum hourly usage. If the maximum hourly usage was not measured directly, state why it was not.

In addition, state how the diurnal pattern for Western Lewis-Rectorville's system as well as the appropriate demand multipliers were determined. This response should be documented by appropriate field measurements.

4. Provide a pressure recording chart showing the actual 24-hour continuously measured pressure available at the locations listed below on Western Lewis-Rectorville'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 6 (Plumville Tank).

b. On Highway 1449 in the vicinity of junction 3.

c. On Highway 1234 in the vicinity of junction 7.

d. On Highway 10 in the vicinity of junction 10.

5. 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.

6. Information currently available to the Commission indicates that the proposed construction is not all within the boundaries of Western Lewis-Rectorville. Based on this, provide a copy of each of the county court orders establishing Western Lewis-Rectorville and defining its boundaries. Also, provide a highway map at a scale of at least one inch equals two miles marked to show Western Lewis-Rectorville's existing and proposed systems. The map of the systems shall show pipeline sizes, location, and connections as well as pumps, water storage tanks and sea level elevations of key points. The map shall also be marked to show the location of the water district's boundaries and labeled to indicate the appropriate court order from which each boundary was determined.

7. The computer hydraulic analyses filed in this case for the existing and proposed water distribution systems indicate that the potential exists for the system to experience high pressure (more than 150 psig) at Node 1. Pressures at this level are in violation of PSC regulation 807 KAR 5:066, Section 6 (1). Provide details of any preventive measures or additional construction Western Lewis-Rectorville intends to perform to protect against this type of occurrence. Details should be documented by hydraulic analyses and field measurements. In addition state whether any complaints of low pressure have been received at these locations.

8. The hydraulic profile filed in this case for the proposed water distribution system indicates that the potential exists for the system to experience low pressure (less than 30

psig) on Highway 1449 between Nodes 1 and 2, on Highway 10 between Nodes 4 and 7 and on Highway 1234 between Nodes 7 and 18. Pressures at this level are in violation of PSC regulation 807 KAR 5:066, Section 6 (1). Provide details of any preventive measures or additional construction Western Lewis-Rectorville intends to perform to protect against this type of occurrence. Details should be documented by hydraulic analyses and field measurements.

9. The information filed in this case indicates that the proposed water storage tank is to be built near Orangeburg. The information also indicates that the Plumville tank is to be abandoned or sold and the Tollesboro tank is to remain in operation. In addition, the information indicates that the Tollesboro tank has an overflow elevation of 947 feet A.S.L. and the bottom of the tank is at an elevation of 867 feet A.S.L. The hydraulic analyses which were filed indicate that the normal hydraulic gradient at the Tollesboro tank site after completion of the proposed construction will never be below 943 feet A.S.L. and the majority of the time the hydraulic gradient is considerably above 947 feet A.S.L. Under these conditions it would appear that the existing Tollesboro tank would remain full most of the time and very little water turnover would take place. As such it would appear that the existing Tollesboro tank would serve very little purpose and may not be needed. Based on the above, provide details of the operational plans for the existing Tollesboro tank after construction of the proposed tank (e.g., the tank will be taken out of service, the system will be operated such that the

water level will be made to fluctuate, etc.). The operational plans should be documented by appropriate field measurements and hydraulic calculations.

10. It is unclear from the engineering information submitted with the application whether Western Lewis-Rectorville is proposing to install fire hydrants or flush hydrants as part of this project in approximately 3 locations. Provide clarification concerning this matter. [Note - KRS 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. The Ten States Standards require a fire hydrant on dead end mains for flushing if flow and pressure is sufficient. Otherwise an approved flushing hydrant or blowoff should be used. If conventional fire hydrants are proposed to be installed 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 Western Lewis-Rectorville's system to comply with the requirements of KRS 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.)]

11. The hydraulic analyses of the existing and proposed water distribution system depict a negative pressure at junction 20. Junction 20 appears to represent the well from which the high service pump obtains its water. It appears that the negative pressure depicts the water level in the well as compared to the ground elevation of the well. If this is correct the negative pressure would appear to be due to improper coding of the computer analysis and would not occur as long as the water level in the well is always above the lowest stage of the vertical turbine pump. Based on the above, provide clarification concerning this matter. (Note - if the pressure or lack thereof reflects an actual negative pressure condition, provide details of any preventive measures or additional construction Western Lewis-Rectorville intends to perform to protect against this type of occurrence. Details should be documented by hydraulic analyses and field measurements).

12. Plan Sheet 1 for Contract 2 depicts a single acting altitude valve on one side of the page and a double acting altitude valve on the other side of the page. Provide clarification on the type of altitude valve which is actually proposed to be installed.

13. In its application Western Lewis-Rectorville proposes to establish water service rates for users in the Project area which are different from the existing rates.



a. Why does Western Lewis-Rectorville intend that the proposed rates and charges apply only to the new customers and not to all customers of the District?

b. Does the new construction provide any benefits to the existing system?

14. Western Lewis-Rectorville proposes a rate structure for its new customers that consists of three rate increments. The present rate structure for existing customers consists of five rate increments.

a. Why has a rate structure been proposed that is different from the existing rate structure?

b. What benefit will the new customers receive under the proposed rate structure as opposed to the present rate structure?

15. In Exhibit A, The Preliminary Engineering Report, Western Lewis-Rectorville indicates that it proposes to charge a connection fee of \$300 to all customers in the affected area. Please provide cost justification for the above mentioned non-recurring charge and for any other non-recurring charges proposed by the District.

16. On July 21, 1987, Western Lewis-Rectorville filed with the Commission a billing analysis for the existing system for a period of January through December of 1986; however, a billing analysis for the proposed system was not included. Please provide a billing analysis for the proposed system using the rate schedule in Exhibit F.

Done at Frankfort, Kentucky, this 6th day of August, 1987.

PUBLIC SERVICE COMMISSION

*Richard D. Hemmelf*  
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For the Commission

ATTEST:

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Executive Director