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**KENTUCKY-AMERICAN WATER COMPANY**
**CASE NO. 2007-00134**
**COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUEST FOR PRODUCTION OF DOCUMENTS**
**Item 1 of 34**

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**Witness: Linda C. Bridwell**

1. Refer to Kentucky-American's application at ¶ 6(3). State Kentucky-American's interpretation of the phrase "total reasonable requirements of its customers under maximum consumption."

**Response:**

KAW's interpretation of the phrase "total reasonable requirements of its customers under maximum consumption" is the ability to meet peak day demands up to the 95% confidence interval through the planning horizon, without restrictions. Additionally, KAW interprets the phrase "total reasonable requirements of its customers under maximum consumption" to be the ability to meet its customers demands for the duration of a prolonged and severe drought while imposing moderate restrictions on outdoor water usage. KAW believes that to incorporate the use of more severe water use restrictions into the planning process threatens the health, safety and economic livelihood of the customers it serves. Incorporating the use of more severe water use restrictions as part of the planning process also eliminates the ability to use such restrictions as a fallback emergency mechanism for extreme or exceptional events that are not considered part of the planning process.

**KENTUCKY-AMERICAN WATER COMPANY**
**CASE NO. 2007-00134**
**COMMISSION STAFF'S FIRST SET OF INTERROGATORIES**
**AND REQUEST FOR PRODUCTION OF DOCUMENTS**


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**Witness:** **Linda C. Bridwell**

2. a. State the maximum safe yield at Pool 3 of the Kentucky River.

   b. Identify all entities that currently are permitted to make withdrawals from Pool 3 of the Kentucky River and state the maximum amounts that each entity is permitted to make.

**Response:**

a) KAW is not aware of any calculation of a safe yield for Pool 3 of the Kentucky River.

b) Buffalo Trace Distillery, Permit #0214, 1.5 million gallons per day.

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**Witness:** **Nick O. Rowe**

3. Refer to Kentucky-American's Application at ¶ 9. State the reasons why Kentucky-American "conclude[d] it was inappropriate to implement its plans to purchase water from Louisville Water Company.

**Response:**

On December 9, 1999 the Lexington-Fayette Urban County Government passed resolution 679-99 after months of review of the water supply situation. That resolution recommended among other things that "the future water supply for Lexington-Fayette County should come from the Kentucky River.." The resolution went on further to state that "in the 2000-2002 time period, the Kentucky River Authority, Kentucky American Water Company and others should...(i)investigate a regional solution to long-term water supply through a joint effort between and among the Urban County Government, Kentucky American Water, Kentucky River Authority, and our surrounding counties, including information to be provided by June 1, 2000 to the Urban county council by the regional Bluegrass Water supply consortium detailing their concept of a regional plan with a time schedule for implementation, cost implications, intergovernmental agreements among and between counties and water providers; and other pertinent facts..."

Although KAW was not required to abide by the recommendations of the LFUCG Council or seek its approval to implement its proposed solution, since the council is the elected representatives of over 90% of KAW's customers, KAW felt it should acquiesce to the Council's stated recommendation to work on a regional solution. While the very vocal opposition to the previously proposed project to purchase water from the Louisville Water company was not insurmountable, the considerable delays that were inevitable based on the vehemence of the opposition could possibly extend the project implementation longer than other alternatives which might be developed with regional consensus, thus leaving KAW's customers at risk for an even greater period of time. Additionally, that opposition would add significant cost to the project which may have made it not the least cost solution at the time. No estimate of those costs or delays have been factored into either the O'Brien and Gere cost estimates or KAW's updated cost estimates.

**KENTUCKY-AMERICAN WATER COMPANY**
**CASE NO. 2007-00134**
**COMMISSION STAFF'S FIRST SET OF INTERROGATORIES**
**AND REQUEST FOR PRODUCTION OF DOCUMENTS**
**Item 4 of 34**

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**Witness: Linda C. Bridwell/Nick O. Rowe**

4. Provide all memoranda, correspondence, electronic mail messages, studies, reports and any other documents in which Kentucky-American or American Water Works Company ("AWWC") officials, employees, or consultants discuss Kentucky-American's plans to purchase water from Louisville Water Company.

**Response:**

Please see separately bound attachment.

**KENTUCKY-AMERICAN WATER COMPANY**
**CASE NO. 2007-00134**
**COMMISSION STAFF'S FIRST SET OF INTERROGATORIES**
**AND REQUEST FOR PRODUCTION OF DOCUMENTS**
**Item 5 of 34**

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**Witness: Linda C. Bridwell**

5. Provide all studies and analyses that Kentucky-American has conducted, commissioned, or otherwise relied upon to determine the safe yield of Pool 9 of the Kentucky River. If a study has previously been provided to the Commission, identify the Commission proceeding in which the study or analysis was submitted and state whether any revisions or updates to the study or analysis have been made since its submission.

**Response:**

These studies include:

Phase I Interim Report Water Demands and Water Supply Yield and Deficit Prepared for the Kentucky River Basin Steering Committee, HARZA Engineering, December 1990;

Kentucky River Source of Supply/Safe Yield Study, HARZA Engineering, June 1992

Task V Report – Development and Evaluation of Water supply Alternatives prepared for Kentucky River Authority, Kentucky Water Resources Research Institute, December 1996.

All of these documents were filed in Case No. 93-434. Since the configuration of the Kentucky River has not changed, no additional revisions or updates to the study or analysis have been made since their submission nor has Kentucky American undertaken any efforts to revise previously developed safe yield numbers of the Kentucky River at Pool 9.

**KENTUCKY-AMERICAN WATER COMPANY**
**CASE NO. 2007-00134**
**COMMISSION STAFF'S FIRST SET OF INTERROGATORIES**
**AND REQUEST FOR PRODUCTION OF DOCUMENTS**
**Item 6 of 34**

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**Witness:** **Linda C. Bridwell/Richard Svindland**

6. Refer to Kentucky-American's application at ¶ 11. Provide all studies and analyses that Kentucky-American has conducted, commissioned, or otherwise relied upon to determine "the most cost effective and feasible solution" is the proposed project.

**Response:**

In 2004, O'Brien and Gere Engineers, Inc. completed a study for the Bluegrass Water Supply Consortium that recommended a regional project be constructed to withdraw water from the Kentucky River at Pool 3, to be treated at a nearby new water treatment plant, with a water main transporting treated water to member systems including KAW. A copy of the report was filed in Case No. 2001-00117. In October 2005, O'Brien and Gere clarified the recommendation of the report in a letter to the BWSC to explain that the recommended solution was both the highest rated and the lowest cost. A copy of that correspondence is attached. KAW retained Gannett-Fleming, Inc. in 2005 to review KAW's deficits and demand projections for their continued reasonableness, review existing reports and alternatives, provide an updated cost comparison for the previously identified top alternatives, and document the findings. That report is attached.

O'BRIEN & GERE

November 8, 2005

Herbert A. Miller, Jr.
American Water Works
Service Company, Inc.
2300 Richmond Road
Lexington, KY 40502

RE: Lowest Cost Alternative
Water Supply

Dear Herb,

Enclosed is a copy of the October 12, 2005 letter regarding the Lowest Cost Alternative for BWSC, as requested.

I enjoyed our discussions at Blue Licks, and look forward to working with you and Linda.

Very truly yours,

O'BRIEN & GERE

George B. Rest, P.E.
Sr. Vice President

Enclosure:

cc: L. Bridwell w/enclosure

O'BRIEN & GERE

October 12, 2005

Mr. Don R. Hassall, PE, General Manager
Bluegrass Water Supply Commission
c/o Bluegrass Area Development District
699 Perimeter Drive
Lexington, KY 40517-4120

Re: Lowest Cost Alternative
Water Supply
File: 36270

Dear Don,

This letter is provided to clarify a matter of significance, which may not be fully understood. On a number of recent occasions, we have heard some concern that BWSC's approach for regional water supply is not the lowest cost option. The implication seemed to be that the Kentucky Public Service Commission, or possibly some of the participants in the BWSC, could only support the lowest cost alternative. Without commenting on the merit of this concern, the fact of the matter is that the recommended option from the Feasibility Study (Kentucky River Pool 3 with a supplemental pipeline to the Ohio River) was <u>both the highest rated and lowest cost</u>, when evaluated "apples to apples". For your convenience, we attach Figures 1-4 which show information presented at Workshops No. 5 and 6. Figures 1 & 2 show cost comparisons with the Louisville Water Company's original and revised pricing, respectively. Figures 3 & 4 shows weighted scoring comparisons with the Louisville Water Company's original and revised pricing.

You no doubt recall that during Workshop No 5, upon showing the results illustrated by Figures 1 & 3, there was a request from Louisville Water Company for a second submittal of their cost proposal. The opportunity to make a second submittal was then provided to all four of the entities which had offered wholesale water supply. Only one, Louisville Water Company, made a second offer. Their second offer was for a substantially lower cost, but also for a substantially lower amount of reserved (guaranteed) capacity. Specifically, the first offer was for <u>45 MGD reserved capacity</u>, while the second offer was for <u>18 MGD reserved capacity, with provision for up to 45 MGD if available</u>. Because the primary driver for the Bluegrass Water Supply Program is the drought deficit, the reserved (guaranteed) capacity is a significant issue. The inherent reliability of the Pool 3/Ohio River Pipeline option is more comparable to the 45 MGD reserved capacity of the first Louisville Water Company proposal.

At Workshop No. 6, the second offer was considered and the scores were adjusted to use the new, lower cost (Figure 2). However, the Pool 3/Ohio River Pipeline option was still ranked higher than all others (Figure 4), and O'Brien & Gere independently recommended that option. We stand by that recommendation today, because on an "apples to apples" comparison, it is both the lowest cost and overall best fit, using the criteria developed for the Feasibility Study. In hindsight, we suspect that the reduction in reserved capacity with Louisville Water Company's second offer was not understood at Workshop No. 6, for if it was, the Pool 3/Ohio Pipeline option should have scored better under the "Adequate Capacity" criteria, thereby making it even more preferred.

Given the importance of this issue, we request the opportunity to discuss it at the October 17th BWSC meeting. If you have any questions, please contact me.

Very truly yours,

O'BRIEN & GERE

George B. Rest, P.E.
Sr. Vice President

CC: Bryan Lovan, P.E.

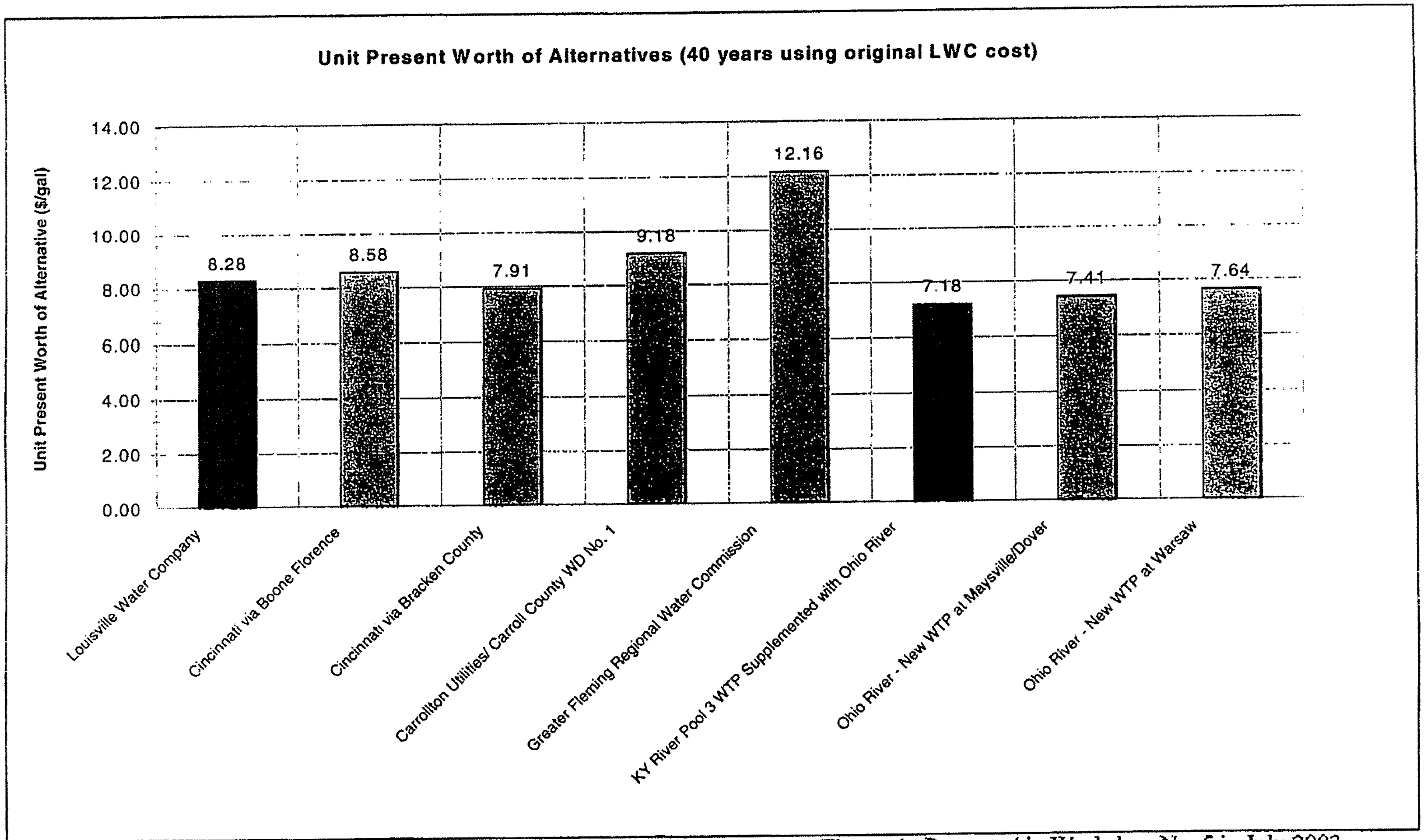



**Figure 1** Presented in Workshop No. 5 in July 2003

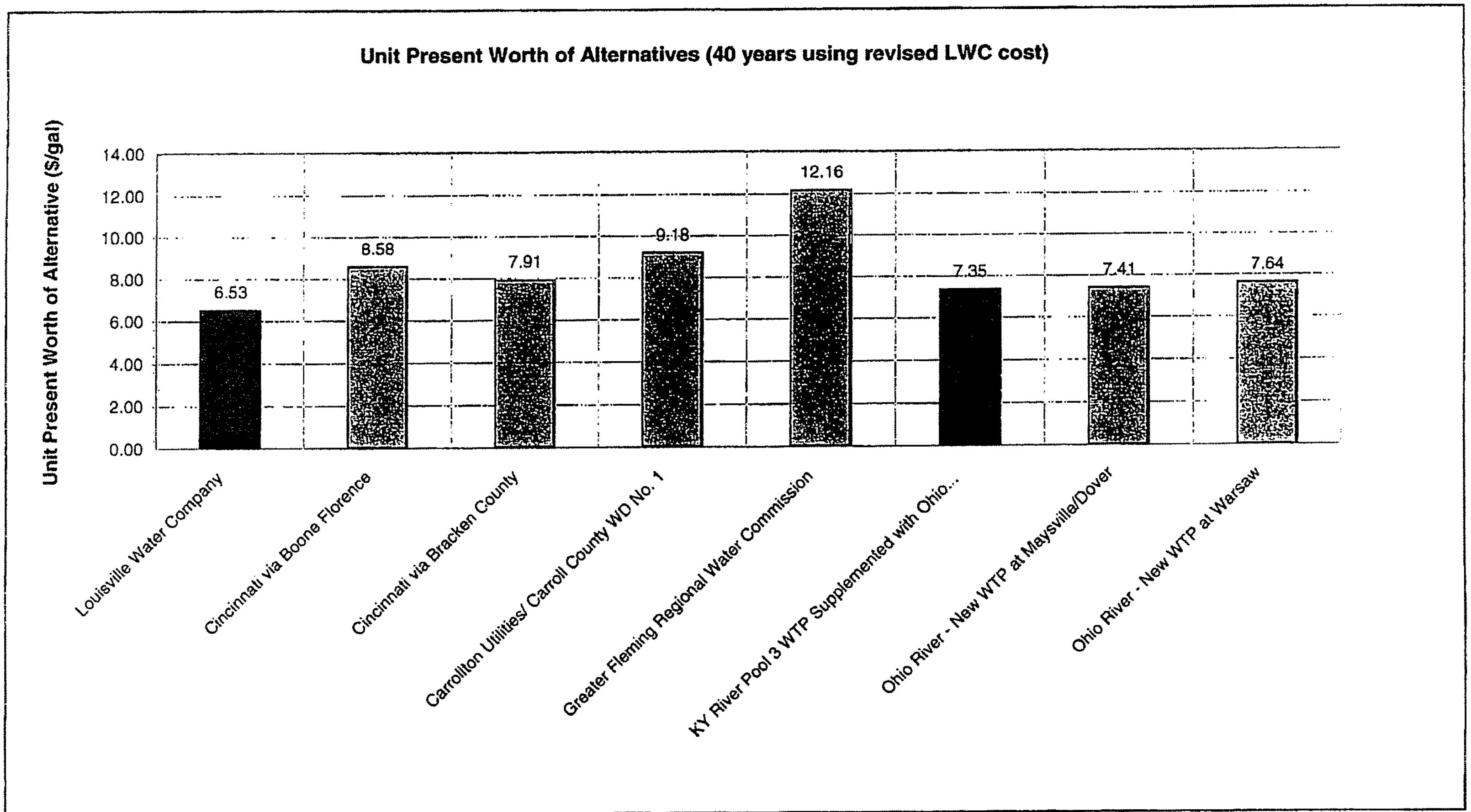



**Figure 2** Presented in Workshop No. 6 in August 2003

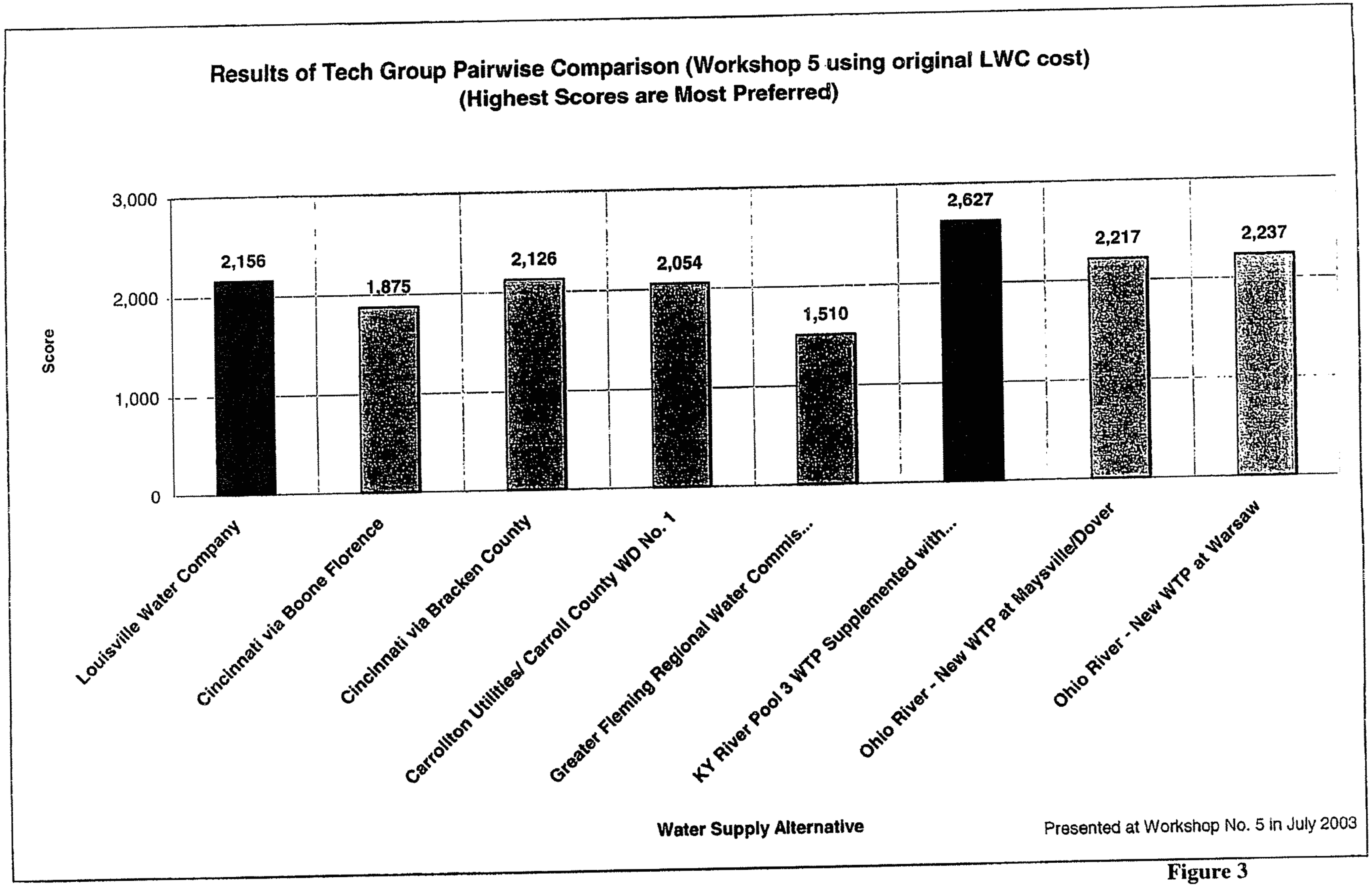

Results of Tech Group Pairwise Comparison (Workshop 5 using original LWC cost)
(Highest Scores are Most Preferred)
Score
3,000
2,000
1,000
0
2,156
1,875
2,126
2,054
1,510
2,627
2,217
2,237
Louisville Water Company
Cincinnati via Boone Florence
Cincinnati via Bracken County
Carrollton Utilities/ Carroll County WD No. 1
Greater Fleming Regional Water Commis...
KY River Pool 3 WTP Supplemented with...
Ohio River - New WTP at Maysville/Dover
Ohio River - New WTP at Warsaw
Water Supply Alternative
Presented at Workshop No. 5 in July 2003

Figure 3

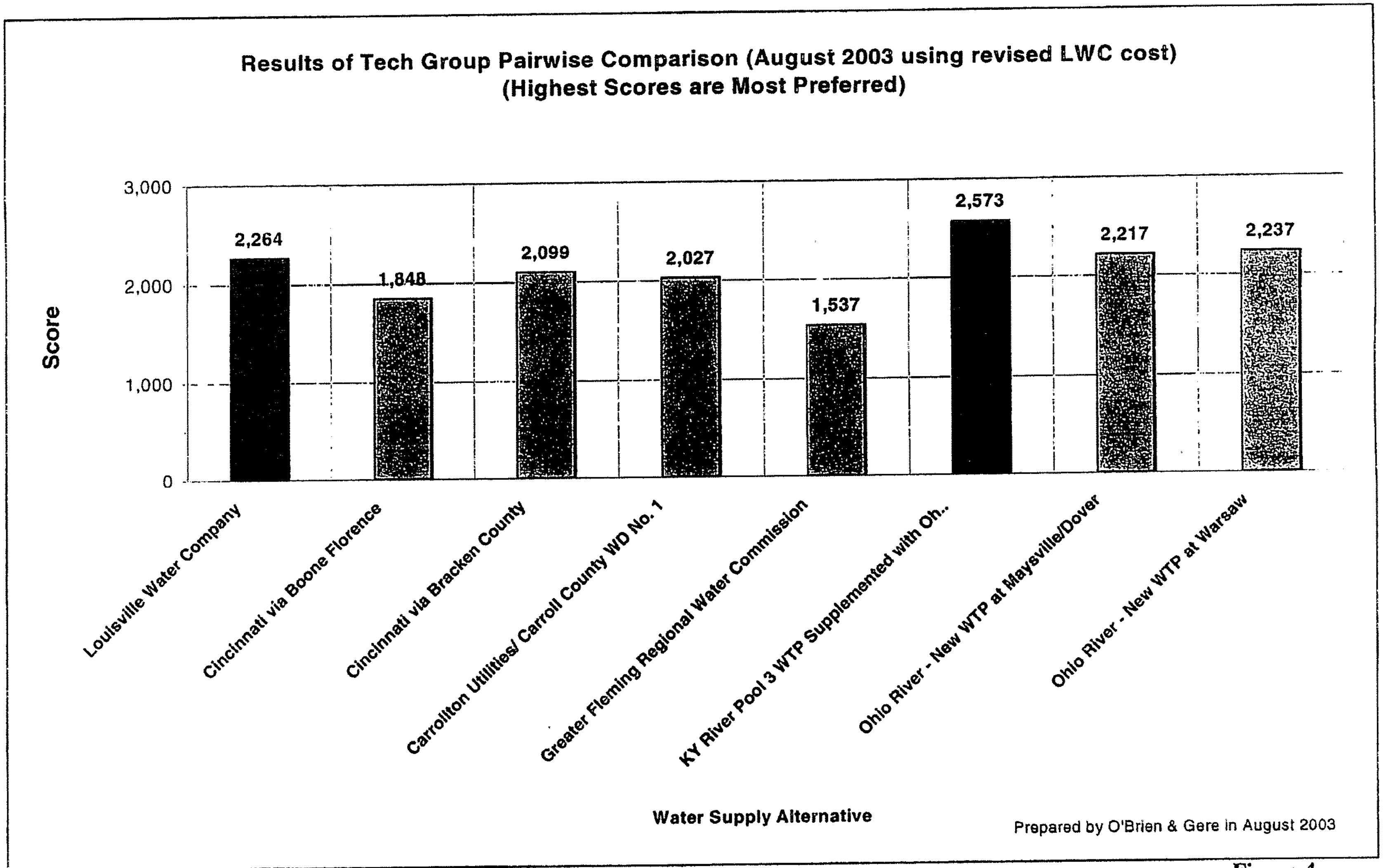

Results of Tech Group Pairwise Comparison (August 2003 using revised LWC cost)
(Highest Scores are Most Preferred)
Score
3,000
2,000
1,000
0
2,264
1,848
2,099
2,027
1,537
2,573
2,217
2,237
Louisville Water Company
Cincinnati via Boone Florence
Cincinnati via Bracken County
Carrollton Utilities/ Carroll County WD No. 1
Greater Fleming Regional Water Commission
KY River Pool 3 WTP Supplemented with Oh..
Ohio River - New WTP at Maysville/Dover
Ohio River - New WTP at Warsaw
Water Supply Alternative
Prepared by O'Brien & Gere in August 2003

Figure 4

LOUISVILLE WATER COMPANY

550 SOUTH THIRD STREET • LOUISVILLE, KENTUCKY 40202

TEL 502-569-3600 FAX 502-569-0815

RECEIVED
JUL
O'BRIEN & GERE
LANDOVER OFFICE

July 9, 2003

Mr. Don R. Hassall, P.E.
Assistant Executive Director
Bluegrass Area Development District
699 Perimeter Drive
Lexington, KY 40517-4120

Re: Bluegrass Water Supply Consortium

Dear Mr. Hassall.

Louisville Water Company (LWC) is pleased to respond to your recent inquiry concerning the supply of finished water to the Bluegrass Water Supply Consortium on a wholesale basis.

Our response is attached and considers the two water demand scenarios outlined in your letter of June 13, 2003. We have prepared this response using our understanding of your project objectives. This document is consistent with the engineering and water rate methodology used in the 1998 contract with Kentucky American Water Company to deliver water to Lexington. Our response is based upon a suggested delivery point located at Interstate 64 and Highway 53.

LWC appreciates this opportunity to work with the Consortium. We look forward to furthering our mutual interests in providing a reliable source of high quality drinking water to Central Kentucky. We would appreciate receiving from you as soon as it becomes available, detailed information regarding the legal authority, identity and authorized management structure of the consortium. Additionally, please be aware that should we enter into formal discussions regarding the provision of water to the consortium, all such discussions are subject to approval of the Board of Water Works. Mr. Jim Smith is our designated contact, and he can be reached at (502) 569-3687. If you need additional information please call me at (502) 569-3680.

Sincerely,

John L. Huber
President

# Discussion Points: Provision of Finished Potable Water to the Bluegrass Water Consortium of Central Kentucky

**July 9, 2003**

**Delivery Point, Water Quality and Demand Scenarios** - Louisville Water Company (LWC) envisions that the point of delivery for finished water will be located in the vicinity of Interstate 64 and Highway 53. LWC would own, operate, and maintain the water transmission main, pump station and storage facilities to the point of delivery. LWC is willing to make a capital commitment towards construction of these pipeline facilities based upon volume, demand factors, length of contract, and other factors negotiated between LWC and the Consortium (or its designee). In consideration of such a capital commitment, LWC recommends a 50-year contract with renewal options, compared to the 20 year term outlined in your letter of June 13, 2003.

LWC's potable, finished water supply could be delivered at a hydraulic grade of 900-950 msl, and working pressure of 40-60 psi (ground elevation 810). The water supply will meet all state and federal drinking water standards. The finished water hardness from both the Crescent Hill and B.E. Payne water treatment plants averaged 162 mg/l in 2002. In 2003, the Company adopted a goal to maintain finished water hardness below 150 mg/l. Through June 2003, the finished water hardness averaged 148 mg/l from both treatment plants. Monthly finished water hardness data is available for review upon request.

In order to meet the demand criteria identified in your letter of June 13, 2003, LWC outlines the following two scenarios for consideration:

> Scenario 1 – Provide 5 mgd base rate of flow with maximum day design capacity of 25 mgd. This requires installation of 60-inch water main to Interstate - 64, a 36-inch water main along Interstate 64 to Highway 53, a booster pump station in Jefferson County at Interstate 265 and a 3 million gallon storage facility at Highway 53 in Shelby County. The estimated cost for this scenario is $23 million, subject to adjustment based upon final design, right-of-way acquisition, and competitive bidding.
>
> Scenario 2 – Provide 9 mgd base rate of flow with a maximum day design capacity of 45 mgd. This scenario requires installation of a 60-inch water main to Interstate 64, two parallel 36-inch water mains along Interstate 64 to Highway 53, a booster pump station in Jefferson County at Interstate 265 and a 5 million gallon storage facility at Highway 53 in Shelby County. To ensure reliable service to meet this demand, facility improvements such as pumping and clear well upgrades are also needed. We recommend parallel facilities to reduce the higher operating risk and allow future maintenance while maintaining operations to deliver the base rate of flow. Parallel facilities will also allow phased construction and capital investment approach. The estimated cost for this option is $47 million, subject to adjustment based upon final design, right-of-way acquisition, and competitive bidding.

These two scenarios have been prepared from a preliminary engineering review of the project objectives outlined in your letter of June 13, 2003. We have not performed a detailed engineering or hydraulic analysis of these scenarios. The suggested scope of the project is intended to be a conservative approach to providing the two water demand scenarios identified. Further engineering design, hydraulic analysis, property/easement research, and review of construction procurement methods may yield opportunities for additional cost savings in the project. In addition, our estimates are based upon projects valued at $5 million or less. A construction scope of this magnitude will likely yield additional economies of scale, further reducing capital costs.

**Water Rate Methodology** – In addition to the capital components previously discussed, the rate for volumes of consumption described in your letter would be based upon terms and conditions that need to be negotiated. Based upon LWC staff's current authorization from the Board of Water Works, any contracted consumption over 1 mgd may be negotiated, based upon certain criteria, including peak demand factors, contract duration, and other terms and conditions. LWC would calculate the rate for this kind of water consumption by taking into consideration four elements: operating expenses, depreciation expenses, return on plant investment, and customer costs. These rate elements are defined as follows:

A. Operating Expense Component - determined for the billing period by dividing the Buyer's usage by the Seller's total sales and multiplying the quotient by Seller's Operating Expenses, less expenses common only to retail customer expenses and to customers generally. This is a variable cost component.

B. Depreciation Expense Component - determined for the billing period by dividing the Buyer's Request by the Seller's production capacity and multiplying the quotient by the Seller's Depreciation Expense, less depreciation on contributed capital and depreciation common only to retail customers and to customers generally. This is a fixed cost component based upon the requested reserved production capacity.

C. Return on Plant Investment Component - determined for the billing period by dividing the Buyer's Request by the Seller's production capacity and multiplying the quotient by Seller's Return on Plant Investment, excluding return on plant investment common only to retail customers and to customers generally. This is a fixed cost component based upon the requested reserved production capacity.

D. Customer Cost Component - determined for the billing period by the Service Charge, at it may change from time to time, currently contained in Section 6.02.1 of Seller's rate schedule. This is a fixed cost component based upon the number and size of meters installed at Buyer's request.

Based upon the above criteria, the Company contemplates several rate scenarios for delivery of water, of which the specifics remain subject to negotiation. The peaking factors identified below are the ratio of the requested reserved production capacity to minimum average day consumption. For the Consortium's planning purposes, those rate elements yield the following imputed water rates based upon current (2003) costs, with periodic adjustment for actual cost of service:

1) *Contract with peaking factor of 5:1*
   - Annual fixed cost for minimum average day of 5 mgd and requested reserved production capacity of 25 mgd is estimated at $4,198,800.
   - ~~Annual fixed cost for minimum average day of 9 mgd and requested reserved production capacity of 45 mgd is estimated at $7,508,100.~~
   - Variable cost per 1000 gallons above minimum average day is estimated at $0.54 up to requested reserved production capacity.
   - Imputed rate per 1000 gallons is $2.33.

2) Contract with peaking factor of 4:1
   - Annual fixed cost for minimum average day of 5 mgd and requested reserved production capacity of 20 mgd is estimated at $3,568,300.
   - Annual fixed cost for minimum average day of 9 mgd and requested reserved production capacity of 36 mgd is estimated at $6,373,200.
   - Variable cost per 1000 gallons above minimum average day is estimated at $0.54 up to requested reserved production capacity.
   - Imputed rate per 1000 gallons is $1.98.

3) Contract with peaking factor of 3:1
   - Annual fixed cost for minimum average day of 5 mgd and requested reserved production capacity of 15 mgd is estimated at $2,937,700.
   - Annual fixed cost for minimum average day of 9 mgd and requested reserved production capacity of 27 mgd is estimated at $5,238,300.
   - Variable cost per 1000 gallons above minimum average day is estimated at $0.54 up to requested reserved production capacity.
   - Imputed rate per 1000 gallons is $1.63.

4) Contract with peaking factor of 2:1
   - Annual fixed cost for minimum average day of 5 mgd and requested reserved production capacity of 10 mgd is estimated at $2,307,200.
   - Annual fixed cost for minimum average day of 9 mgd and requested reserved production capacity of 18 mgd is estimated at $4,103,300.
   - Variable cost per 1000 gallons above minimum average day is estimated at $0.54 up to requested reserved production capacity.
   - Imputed rate per 1000 gallons is $1.28.

5) Contract with peaking factor of 1:1
   - Annual fixed cost for minimum average day of 5 mgd and requested reserved production capacity of 5 mgd is estimated at $1,676,700.
   - Annual fixed cost per minimum average day of 9 mgd and requested reserved production capacity of 9 mgd is estimated at $2,968,400.
   - Variable cost per 1000 gallons above minimum average day is estimated at $0.54 up to requested reserved production capacity.
   - Imputed rate per 1000 gallons is $0.93

**Next Steps** - Additional elements must be addressed before we can move forward, offer a formal proposal and enter into final negotiations. These include determination of the investment in the project by LWC, provisions for design services, construction timetables, operating parameters, as well as further delineation of water rate adjustments. We look forward to the opportunity for the detailed discussions which will allow us to further define these parameters. Mr. Jim Smith is our designated contact, and he can be reached at (502) 569-3687.

LOUISVILLE WATER COMPANY

550 SOUTH THIRD STREET • LOUISVILLE, KENTUCKY 40202

TEL 502-569-3600 FAX 502-569-0815

August 8, 2003

Mr. Don R. Hassall, P.E.
Assistant Executive Director
Bluegrass Area Development District
699 Perimeter Drive
Lexington, KY 40517-4120

Re: Bluegrass Water Supply Consortium

Dear Mr. Hassall:

Louisville Water Company is pleased to provide an update to our initial response concerning the supply of finished water to the Bluegrass Water Supply Consortium.

Thank you again for the opportunity to work with the Consortium. We continue to look forward to furthering our mutual interests in providing a reliable source of high quality drinking water to Central Kentucky. Again, should we enter into formal discussions regarding the provision of water to the Consortium, any agreement resulting from the discussion remains subject to approval of the Board of Water Works. Please continue to utilize Mr. Jim Smith as your primary contact. He can be reached at (502) 569-3687. If you need additional information please call me at (502) 569-3680.

Sincerely,

John L. Huber
President

**Water Rate Methodology** – In addition to the capital components previously discussed, the rate for volumes of consumption described in your letter would be based upon terms and conditions that need to be negotiated. Based upon LWC staff's current authorization from the Board of Water Works, any contracted consumption over 1 mgd may be negotiated, based upon certain criteria, including peak demand factors, contract duration, and other terms and conditions. LWC would calculate the rate for this kind of water consumption by taking into consideration four elements: operating expenses, depreciation expenses, return on plant investment, and customer costs. These rate elements are defined as follows:

A. Operating Expense Component - determined for the billing period by dividing the Buyer's usage by the Seller's total sales and multiplying the quotient by Seller's Operating Expenses, less expenses common only to retail customer expenses and to customers generally. This is a variable cost component.

B. Depreciation Expense Component - determined for the billing period by dividing the Buyer's Request by the Seller's production capacity and multiplying the quotient by the Seller's Depreciation Expense, less depreciation on contributed capital and depreciation common only to retail customers and to customers generally. This is a fixed cost component based upon the requested reserved production capacity.

C. Return on Plant Investment Component - determined for the billing period by dividing the Buyer's Request by the Seller's production capacity and multiplying the quotient by Seller's Return on Plant Investment, excluding return on plant investment common only to retail customers and to customers generally. This is a fixed cost component based upon the requested reserved production capacity.

D. Customer Cost Component - determined for the billing period by the Service Charge, as it may change from time to time, currently contained in Section 6.02.1 of Seller's rate schedule. This is a fixed cost component based upon the number and size of meters installed at Buyer's request.

Based upon the above criteria, the Company contemplates a scenario for delivery of water based upon requested reserved capacity of two times the minimum average day and available capacity of up to five times the minimum average day. For the Consortium's planning purposes, those rate elements yield the following imputed water rate based upon current (2003) costs, with periodic adjustment for actual cost of service:

- Annual fixed cost for minimum average day of 5 mgd and requested reserved production capacity of 10 mgd and available capacity of up to 25 mgd is estimated at $2,307,200.
- ~~Annual fixed cost for minimum average day of 9 mgd and requested reserved production capacity of 18 mgd and available capacity of up to 45 mgd is estimated at $4,103,300.~~
- Variable cost per 1000 gallons above minimum average day is estimated at $0.54 up to requested reserved production capacity. Variable cost per 1000 gallons above requested reserved production capacity is estimated at $1.35, our standard wholesale rate, up to available capacity.
- **Imputed rate per 1000 gallons is $1.28.**
- Any consumption above requested reserved production capacity will be the new reserved production capacity for the next 36 months.

Kentucky American Water
Lexington, Kentucky

# Water Supply Study

March 2007

Gannett Fleming, Inc.
Harrisburg, Pennsylvania

# Kentucky American Water
# Water Supply Study

## Contents

# Kentucky American Water
# Water Supply Study

## Contents (Contd)



## Tables

## Exhibits



## Appendices

## EXECUTIVE SUMMARY

Kentucky American Water (KAW) previously identified deficiencies in both its raw water supply and its treatment capacity. On August 21, 1997, the Kentucky Public Service Commission (PSC) ordered KAW to "take the necessary and appropriate measures to obtain sources of supply so that the quantity and quality of water delivered to its distribution system shall be sufficient to adequately, dependably, and safely supply the total reasonable requirements of its customers under maximum consumption through the year 2020".

The Bluegrass Water Supply Consortium (Consortium) was formed in 1999 by a group of regional water suppliers, including KAW, to identify and implement a regional solution to the area's water supply deficiencies. A Water System Regionalization Feasibility Study was prepared for the Bluegrass Area Development District in association with the Consortium in February 2004. This report documented a conceptual network of treated water pipelines, construction of a new water treatment plant to treat water from Pool 3 of the Kentucky River, and a supplemental raw water supply pipeline from the Ohio River as the solution to the regional water supply deficiencies.

In August 2004, the Bluegrass Water Supply Commission (BWSC) was formed to implement the water supply plan identified in the February 2004 report. The establishment of the BWSC did not relieve KAW of its responsibility to ensure an adequate water supply for its customers. KAW supports a regional solution to the water supply problem, actively participating and providing resources to the BWSC. In March 2006, KAW felt that customer and regulatory pressure for a solution intensified. Therefore, KAW committed to present a deliberate plan of action to the PSC by Spring 2007, announcing it would build a treatment plant and transmission line for adequate supply by 2010. KAW is continuing to work with the BWSC on a partnership for the new facilities.

KAW demand projections are based on historical trends and projected population, and utilize planning methodology that was previously reviewed and confirmed by the PSC. Updated demand projections made in 2006 by KAW indicated a projected 2020 maximum day demand for a hot, dry scenario of about 80 million gallons per day (mgd). The 2020 drought average day demand projection was forecast to be 59 mgd.

The Kentucky River currently supplies nearly all of the source water for KAW. Jacobson Reservoir, with a 500 million gallon capacity, is used as a supplemental source, but most of the water that refills the reservoir in the summer is pumped from the Kentucky River. The safe yield of the Kentucky River at the KAW intake (Pool 9) has been estimated to be 35 mgd in previous studies. The KAW Permit to Withdraw Public Water (Permit No. 200, revised September 17, 1999) limits water withdrawals to 60.0 mgd in the months of November through April and 63.0 mgd in the months of May through October. As a condition of the Permit, during periods of low river flow and drought conditions the allowable withdrawals must be reduced incrementally to as low as 30.0 mgd. Temporary Permit modifications have been typically requested by KAW and approved by the Kentucky Division of Water (KDOW) on an annual basis that have increased the minimum allowable withdrawal to 35 mgd, with the incremental reductions based on river flow and the water level in the pools. These modifications have been temporary and can be suspended by the KDOW based on drought severity and basin conditions. KAW also has a Permit to Withdraw Public Water (Permit No. 201, amended December 1, 1971) from the Jacobson Reservoir. This Permit allows for a withdrawal of up to 16 mgd.

The combined reliable water treatment capacity for the Kentucky River Station (KRS) and the Richmond Road Station (RRS) is 65 mgd, including a rated capacity of 40 mgd at the KRS and a rated capacity of 25 mgd at the RRS. Improvements at the RRS in 1992 increased the reliable capacity from 20 to 25 mgd. KAW has demonstrated the ability to operate the KRS and RRS at up to 50 mgd and 30 mgd, respectively, while maintaining good water quality. However, these rates are not considered reliable. KDOW has indicated that, if necessary to meet demands, KAW has temporary approval to operate these water treatment plants at higher rates as long as all health standards are met and adequate disinfection is maintained.

Three (3) alternatives are evaluated in this study to address the identified KAW source of supply and treatment capacity deficiencies. These alternatives include the BWSC plan, a previously-defined project to connect to the Louisville Water Company (LWC), and a KAW Kentucky River Pool 3 Water Treatment Plant (WTP) project.

The "original" BWSC plan included a 45 mgd water treatment plant. Because of a reduction in the number of member utilities in the BWSC, and the associated decrease in projected demands, the capacity of the water treatment plant was reduced to 31 mgd. KAW entered into a non-binding commitment with the BWSC for 22 mgd from the regional system. The estimated project cost of the revised (31 mgd) BWSC project is $239,336,000, in 2006 dollars. If the project cost was to be shared among the participants in proportion to their respective committed capacity, KAW would be responsible for 22/31 of the project cost.

KAW planning studies conducted more than 10 years ago identified a LWC alternative to supply treated water to KAW via a dedicated pipeline as the least cost option to meet projected KAW customer demands. KAW initiated final planning and design for the project in 1998. In response to significant public opposition, KAW stopped all work on the project in 1999. In order to compare a LWC project with other alternatives, costs were updated to reflect current levels. The estimated project cost of a LWC project is $140,500,000, in 2005 dollars.

Another alternative investigated in this study involved construction by KAW of an intake in Pool 3 of the Kentucky River, a 20 mgd water treatment plant (expandable to 30 mgd), and high service pumping and transmission facilities to connect to the existing KAW Central Division distribution system, which includes Lexington-Fayette County and parts of six (6) surrounding counties. Five (5) potential intake/raw water pumping station sites and six (6) potential water treatment plant sites are identified and investigated in the study. Four (4) combinations of these sites and six (6) treated water transmission main routes are evaluated in detail. The estimated project cost of a KAW Pool 3 WTP alternative ranges from $145,659,000 to $158,086,000, in 2006 dollars.

All three (3) water supply and treatment alternatives investigated in this study would have annual costs associated with them. For the BWSC alternative, the annual cost would be in the form of bulk supply cost. For the LWC pipeline alternative, the annual cost would be a combination of bulk supply cost and KAW pumping cost for conveying water through the transmission main to the Central Division distribution system. For the KAW Pool 3 WTP alternative, there would be annual operation and maintenance costs. Because KAW would use water from any of these alternatives only on a limited basis, a constant flow of 4.4 mgd is used to estimate annual costs for each alternative. This value is based on the 22 mgd non-binding commitment KAW entered into with the BWSC, under which KAW would receive 20% of the commitment (4.4 mgd) as a base flow. For the purposes of this study, a 21-year period (2010-2030) is used to compare annual costs.

For alternative comparison purposes, the KAW annual cost for participation in the revised (31 mgd) BWSC project would be a percentage of the total costs based on committed capacity. The operating costs for the 31 mgd BWSC WTP are estimated based on average production of 6.2 mgd (20% of 31 mgd). In addition, a $200,000 annual maintenance fee is included to cover other facilities, which amount is increased 3% per year. As with the project cost, if the annual operations and maintenance costs for a BWSC 31 mgd WTP project were to be shared among the participants in proportion to their respective committed capacity, KAW would be responsible for 22/31 of the costs.

The annual cost associated with the LWC pipeline project would be associated with the bulk purchase cost of water charged by the LWC and the KAW pumping cost. Based on information contained in a 1998 Agreement between KAW and the LWC, the bulk rate would be $0.75 per 1,000 gallons. No contact was made with the LWC; therefore, it is not known if the terms of this Agreement are still valid. For alternative comparison purposes, flow from the LWC to KAW is maintained at 4.4 mgd from 2010 to 2030. The bulk rate is projected to increase 3% per year. KAW annual pumping cost is estimated to be $200,000 in 2010, and is projected to increase 3% per year.

The annual operating costs for a KAW Pool 3 WTP (20 mgd capacity) operating at 4.4 mgd are estimated for 2010 to 2030. Labor, power, chemical, and other costs are increased 3% per year. In addition, a $200,000 annual maintenance fee is included to cover other facilities, which amount is increased 3% per year.

The present worth of the future year project and annual costs for each of the three (3) alternatives is presented for this study. It is assumed that construction of the selected project would begin in 2008 and operation would begin in 2010. The cumulative amount of the present worth of the 2010-2030 annual costs added to the present worth of the capital project cost yields the total present worth for each alternative.

Assuming KAW would be responsible for 22/31 of the BWSC project and annual costs, the present worth for this alternative is $172,258,000. The present worth of the LWC project and annual costs is $154,438,000. It should be noted that the LWC project was originally planned to serve only KAW. In that regard, 36-inch pipe was included in the design of the transmission main to provide capacity of up to about 23 mgd. The BWSC project is for a regional system, and the KAW project could be expanded for regional service. Both the BWSC and the KAW projects include 42-inch pipe for the transmission mains, and the associated costs are based on use of 42-inch pipe. The present worth of the project cost for the LWC project would be significantly increased above $154,438,000 if 42-inch pipe was included to increase transmission capacity to levels comparable to the BWSC and KAW projects. The increase in transmission main construction cost from 36-inch pipe to 42-inch pipe for the LWC project is estimated to be $16,400,000. The present worth of the KAW project and annual costs is $152,366,000 for the least cost and recommended intake/raw water pumping station and water treatment plant combination.

# 1.0 BACKGROUND AND INTRODUCTION

Kentucky American Water (KAW) previously identified deficiencies in both its raw water supply and its treatment capacity. On August 21, 1997, the Kentucky Public Service Commission (PSC) ordered KAW to "take the necessary and appropriate measures to obtain sources of supply so that the quantity and quality of water delivered to its distribution system shall be sufficient to adequately, dependably, and safely supply the total reasonable requirements of its customers under maximum consumption through the year 2020".

In response to this Order, KAW began final planning and design of the Ohio River supply project in 1998, which included bulk purchase of treated water from the Louisville Water Company and transmission of that water to the KAW system through a large-diameter main. This project met with significant public opposition. Alternate routes were explored, and a community education program was initiated. Despite route modifications and community outreach, opposition to the project intensified, and KAW agreed to stop all work on the Ohio River supply project and cooperate with the Lexington Fayette Urban County Government (LFUCG) Council, which represented 95% of KAW customers, in its review of water supply alternatives.

In December 1999, the LFUCG passed Resolution 679-99, which, among other things, confirmed the magnitude of KAW's supply and production capacity deficit and proposed a Kentucky River solution to the problem. The LFUCG solution proposed that during 2000-2002 the Kentucky River Authority (KRA) should acquire Dams 6, 7, 8, 9, and 11 on the Kentucky River, complete an environmental assessment of Dam 10, complete a general assessment of all dams to determine which dam would be next for renovations (including raising of dam level), and study modifications of East Kentucky Power's intake in Pool 10. Upon completion of Dam 10 construction, water treatment capacity upgrades would be developed and implemented. Dam 10 was to be raised in order to increase supply capacity for KAW. If sufficient progress was not made, however, a reassessment of all options, including pipeline construction, would be performed in 2003.

In 1999, the Kentucky Water Resources Research Institute (KWRRI) presented several proposals to raise additional dams and further mine the pools of various dams. They presented a timeframe for this construction, as well as estimated increased supply capacities.

The Bluegrass Water Supply Consortium (Consortium) was formed in 1999 by a group of regional water suppliers, including KAW, to identify and implement a regional solution to the area's water supply deficiencies. A Water System Regionalization Feasibility Study was prepared for the Bluegrass Area Development District in association with the Consortium in February 2004. This report documented a conceptual network of treated water pipelines, construction of a new water treatment plant to treat water from Pool 3 of the Kentucky River, and a supplemental raw water supply pipeline from the Ohio River as the solution to the regional water supply deficiencies.

In August 2004, the Bluegrass Water Supply Commission (BWSC) was formed to implement the water supply plan identified in the February 2004 report. The enabling legislation did not allow a private entity to be a member of the BWSC; therefore, it was formed by nine (9) Consortium members, except for KAW, which was considered to be a partner with the BWSC.

The establishment of the BWSC did not relieve KAW of its responsibility to ensure an adequate water supply for its customers. KAW supports a regional solution to the water supply problem, actively participating and providing resources to the BWSC. In March 2006, KAW felt that customer and regulatory pressure for a solution intensified. Therefore, KAW committed to present a deliberate plan of action to the PSC by Spring 2007, announcing it would build a treatment plant and transmission line for adequate water supply by 2010. KAW is continuing to work with the BWSC on a partnership for the new facilities.

## 2.0 EXISTING REPORTS

Brief summaries of three (3) key reports that describe the KAW and regional water supply deficiencies are provided below. These summaries are provided as background information and documentation of the history of water supply efforts in the area since the early 1990s.

### 2.1 Efforts to Ensure Adequate Sources of Supply to Meet Customer Demand Through 2020 (KAW Report to the Kentucky PSC, March 2001)

In the March 2001 report, KAW indicated a 2001 source of supply deficit of 21 million gallons per day (mgd), based on a drought average day demand of 56 mgd, and a reliable production capacity deficit of 11 mgd, based on a maximum day demand of 76 mgd. The Kentucky River and Jacobson Reservoir provide the raw water supply for KAW. KAW developed a plan to deliver treated water from an Ohio River source through a new pipeline to address both the water supply and the treated water production deficits. However, the plan was met with resistance from local residents and customers. In 1999, the LFUCG called for a Kentucky River solution to the region's water supply shortage. In response to public sentiment, KAW pledged support for this plan. In February 2001, the PSC asked KAW for an update of its actions taken since the August 1997 Order. The March 2001 report summarized the activities of KAW and other groups to reach a regional solution. The report also included planned future activities and questions posed for additional consideration.

Regional activities summarized in the March 2001 report are as follows:

- Through 2001, none of the KWRRI water supply plans had been adopted or implemented, nor would they solve the deficit problem.
- In June 2000, the KRA informed the LFUCG that the completion of Dam 10 construction would take at least 6 years.
- At a meeting in July 2000, a representative of the U.S. Army Corps of Engineers reported that it was in a position to turn over ownership of <u>all</u> dams. Through 2001, this transfer was not completed.

- The date to begin construction of Dam 10 improvements was delayed further by the U.S. Army Corps of Engineers in February 2001. At the same time, it was announced the rehabilitation costs had increased to $37.3 million.

Future activities proposed by KAW for the resolution of the production deficits included short-term solutions, such as hydraulic improvements at the Richmond Road Station (RRS) to produce an additional 5 mgd and the purchase of finished water from the Frankfort Electric & Water Plant Board. Short-term source of supply solutions also included the pursuit of increased withdrawal allowances. Long-term solutions included modeling of the suggested Kentucky River supply improvements (raising of dams and mining of water from pools) to determine if they were adequate to solve the deficit. If the improvements were deemed adequate, KAW would continue with the water treatment process improvements to increase capacity previously outlined in LFUCG Resolution 679-99. If these proposed improvements were deemed inadequate, however, KAW should determine what other options were available to improve water supply.

Questions presented in the March 2001 report for discussion included: (1) the feasibility of raising the designated dams; (2) the relevant timeframe of raising the dams; and (3) if feasible, the portion of the additional gained supply from raising the dams that would be allotted to KAW for utilization. In summary, the question was whether the concept outlined by the LFUCG represented the most reasonable schedule for the solution to the problem, and whether the schedule could be expedited in any way.

## 2.2 Water System Regionalization Feasibility Study (O'Brien & Gere, February 2004)

The Bluegrass Area Development District (Bluegrass ADD), in association with the Consortium, contracted with a team of consultants headed by O'Brien & Gere Engineers, Inc. (O'Brien & Gere) to develop a water system regionalization plan for Central Kentucky. The report was prepared by O'Brien & Gere in February 2004 and documented planned development activities. Their work included six (6) public workshops that helped to develop a consensus among the seventeen (17) participating water utilities.

The objectives of the BWSC plan were to bring "on line" highly reliable water supplies within 3 to 5 years and to optimize regional water supplies using a grid network of water pipelines to transport potable water. Two of the best alternatives to achieve these objectives, identified from over 40 options, included the purchase of water from the Louisville Water Company, and the construction of a new treatment plant at Kentucky River Pool 3. Evaluation of the Kentucky River Pool 3 alternative by the team of consultants revealed that even considering proposed water credits, this alternative could not be relied upon to satisfy the target regional supply of 45 mgd in 2020. To account for the occurrence of extreme drought conditions, supplemental supply would be provided from the Ohio River. The report recommended the Kentucky River alternative based on "higher overall score" of rankings at one of the workshops, although the Louisville Water Company alternative was the most cost-effective. The initial sections of the report provided background on demand projections, supply deficits, water credits, and Dam 10 construction. The BWSC plan did not propose to replace existing supply sources, treatment facilities, and distribution systems, but rather intended to augment those supplies with water from the grid network. Criteria used to evaluate the alternatives, including the Kentucky River Pool 3 alternative and the alternative to purchase water from the Louisville Water Company, were discussed. The Pool 3 alternative was the only one that relied on the Kentucky River, which was important because of the desire expressed by stakeholder groups for a Kentucky River solution to the regional water supply problem.

The proposed pipeline grid network was to connect to existing KAW pipelines to supply water to BWSC member utilities. Because mixing of various treated water supplies would occur under these conditions, the potential for water quality problems was recognized. A solution that would require the use of chloramines by all treatment facilities and the conversion of chloraminated water back to a free chlorine residual for certain facilities was proposed. Difficulties in dealing with regulatory requirements for consecutive systems with supply from a grid network were also identified. Although use of a grid network concept was not fatally flawed, all associated issues were not resolved at the time the report was issued.

The BWSC would own and manage the proposed facilities. Potential funding sources for the proposed alternatives were identified, and revenue requirements to pay for capital and operating costs were discussed in the report. "Take or Pay" contracts, where each utility would commit to paying for a certain capacity reserved for them and to taking a minimum daily quantity of water, were discussed. The financing plan included a recommendation that a common unit cost be charged to all participants. Other than through these contracts, participants would not be responsible for long-term debt incurred by BWSC to construct the water supply and pipeline grid facilities. BWSC would operate as a non-profit organization, with the intention of recovering capital and operating costs.

The February 2004 report concluded that the Kentucky River Pool 3 alternative with supplemental Ohio River supply was the best alternative that utilized highly reliable supply sources and could be available within 3 to 5 years. The report indicated that: (1) the grid network had been conceptually configured; (2) the management/ownership approach based on the formation of the BWSC was fair and flexible; (3) a fair and affordable financial plan had been developed; and (4) the study process and findings had been communicated to the public.

Subsequent to delivery of the report, the BWSC was formed, which included nine (9) Consortium members, except for KAW. The BWSC was to implement the water supply plan identified in the report prepared for the Bluegrass ADD and the Consortium.

### 2.3 Update of March 2001 KAW Report to the Kentucky PSC (November 2004)

In a November 2004 update of the March 2001 report to the PSC, KAW provided a status of the recommendations made in the 2001 report. A project to provide hydraulic improvements at the RRS to produce an additional 5 mgd had been completed by KAW. Efforts by KAW to explore the option of purchasing water from the Frankfort Electric & Water Plant Board were suspended to avoid potential conflicts with regional efforts of the BWSC. An update of the model of the Kentucky River flows had been completed by the KRA, but the model had not been converted to new software. Finally, neither the Environmental Impact Statement nor the design for raising Dam 10 had been completed, and their completion timeframe was unknown. Indications from the U. S. Army Corps of Engineers were that permanently raising the elevation of Dam 10 could have an unacceptable environmental impact, which could further delay implementation.

KAW realized that a regional effort was more likely to produce a solution to the identified water supply deficiencies. KAW expected the BWSC to have a funding plan and contracts in place as their next step, with proposed construction of a first phase of the regional project to be completed by 2007. If this schedule was not met, however, KAW indicated in the 2004 update that it would have to re-evaluate the BWSC partnership and potentially pursue other options.

## 3.0 DEMAND PROJECTIONS

### 3.1 Review of KAW Demand Projections

KAW demand projections (Table 1) are based on historical demand trends. Updated demand projections (2006) indicated a projected 2020 maximum day demand for a hot, dry scenario of 80.90 mgd. The calculated (actual) average day demand in 2005 was 44.22 mgd, the highest for the period of record (1986-2005). KAW adds approximately 2,500 new customers per year, which supports increasing demand projections. High demands in 2006 and beyond could increase projected future demands, as the KAW demand projection model is sensitive to actual system usage and population projections. Following a review of the planning methodology and demand projections for KAW, the PSC issued an Order on March 14, 1995 that confirmed the reasonableness of KAW's then-current demand projections, indicating that KAW used reputable sources of data and nationally-accepted methodologies in developing its demand projections. Those same methodologies are continued in use and are periodically reviewed for appropriateness. The 2020 maximum day demand projection for a hot, dry scenario was forecast to be 80 mgd. The 2020 drought average day demand projection was forecast to be 59 mgd, based on the 2006 KAW analysis. These values will be used in evaluating existing supply and treatment capacity deficiencies and potential improvements.

## Table 1

## Water Demand Projections

Updated Demand Projections (in mgd) with 2006 Population Projections:

| Normal Weather | 2000 Actual | 2005 Actual | 2010 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|---|---|
| Residential | 20.13 | 22.30 | 20.79 | 21.84 | 22.90 | 23.69 | 24.48 |
| Commercial/Industrial | 10.70 | 12.18 | 11.31 | 11.82 | 12.33 | 12.71 | 13.08 |
| Public/Unaccounted for | 7.20 | 6.73 | 6.94 | 7.20 | 7.46 | 7.66 | 7.85 |
| Other | 2.99 | 3.02 | 3.02 | 3.09 | 3.16 | 3.21 | 3.26 |
| Average Day Demand | 41.02 | 44.22 | 40.14 | 41.97 | 43.80 | 45.16 | 46.52 |
| Maximum Day Demand | 66.37 | 69.95 | 70.14 | 73.20 | 76.25 | 78.52 | 80.78 |
| **Hot, Dry Scenario** | | | | | | | |
| Average Day Demand | | | 42.67 | 44.61 | 46.57 | 48.01 | 49.46 |
| Maximum Day Demand | | | 74.52 | 77.72 | 80.90 | 83.26 | 85.63 |
| Drought Average Day | | | 54 | 57 | 59 | 61 | 62 |

# 4.0 KAW SOURCE OF SUPPLY AND TREATMENT CAPACITY DEFICIENCIES

## 4.1 Source of Supply Deficiencies

The Kentucky River currently supplies nearly all of the source water for KAW. Jacobson Reservoir, with a 500 million gallon capacity, is used as a supplemental source, but most of the water that refills the reservoir in the summer is pumped from the Kentucky River. The safe yield of the Kentucky River at the KAW intake (Pool 9) has been estimated in previous studies. A study conducted in 1992 by the Harza Engineering Company determined a safe yield of 35 mgd during the drought of record (1930), adjusted for current conditions in the basin. The Kentucky Water Resources Research Institute (KWRRI) modeled the Kentucky River in 1996 using the storage in the pools and calculated a volumetric deficit over the duration of the drought of record, which results approximated a safe yield of the Kentucky River of 35 mgd at Pool 9.

The KAW Permit to Withdraw Public Water (Permit No. 200, revised September 17, 1999) limits water withdrawals to 60.0 mgd in the months of November through April and 63.0 mgd in the months of May through October. As a condition of the Permit, during periods of low river flow and drought conditions the allowable withdrawals must be reduced incrementally to as low as 30.0 mgd. Temporary Permit modifications have been typically requested by KAW and approved by the Kentucky Division of Water (KDOW) on an annual basis that have increased the minimum allowable withdrawal to 35 mgd, with the incremental reductions based on river flow and the water level in the pools. These modifications have been temporary and can be suspended by the KDOW based on drought severity and basin conditions. KAW also has a Permit to Withdraw Public Water (Permit No. 201, amended December 1, 1971) from the Jacobson Reservoir. This Permit allows for a withdrawal of up to 16 mgd.

KAW bases the adequacy of supply on its ability to meet the drought average day demand. Under a worst-case scenario, permitted withdrawals from the Kentucky River are limited to 30 mgd. Comparison of the 30 mgd permitted withdrawal with the drought average day demands in Table 1 indicates that there will be a supply deficit of 24 mgd by 2010, 27 mgd by 2015, and 29 mgd by 2020, as shown in Table 2. However, KAW has determined that it is reasonable for some water resource management to be utilized during a drought of record, which may include moderate restrictions on customer water use.

**Table 2**

**Projected Supply and Treatment Capacity Deficiencies**

| Year | Scenario | Demand (mgd) (1) | Permitted Supply (mgd) (2) | Supply Deficiency | Treatment Capacity (mgd) (3) | Treatment Capacity Deficiency (4) |
|---|---|---|---|---|---|---|
| 2010 | Normal Weather - Max Day | 70.1 | 76 | --- | 65 | 5.1 |
| | Hot, Dry Scenario - Max Day | 74.5 | 61 | 13.5 | 65 | 9.5 |
| | Drought Average Day | 54.0 | 30 | 24.0 | 65 | --- |
| 2015 | Normal Weather - Max Day | 73.2 | 76 | --- | 65 | 8.2 |
| | Hot, Dry Scenario - Max Day | 77.7 | 61 | 16.7 | 65 | 12.7 |
| | Drought Average Day | 57.0 | 30 | 27.0 | 65 | --- |
| 2020 | Normal Weather - Max Day | 76.2 | 76 | --- | 65 | 11.2 |
| | Hot, Dry Scenario - Max Day | 80.9 | 61 | 19.9 | 65 | 15.9 |
| | Drought Average Day | 59.0 | 30 | 29.0 | 65 | --- |
| 2030 | Normal Weather - Max Day | 80.8 | 76 | 4.8 | 65 | 15.8 |
| | Hot, Dry Scenario - Max Day | 85.6 | 61 | 24.6 | 65 | 20.6 |
| | Drought Average Day | 62.0 | 30 | 32.0 | 65 | --- |

Notes:

(1) Demands are taken from KAW 2006 projections in Table 1.

(2) Available supply for the different conditions is based on the following:

a. Normal Weather Max Day = Base permitted withdrawals from Kentucky River and Jacobson Reservoir.

b. Hot, Dry Scenario Max Day = Phase 2 Drought permitted withdrawal from Kentucky River (45 mgd – water level at crest of dam) and permitted withdrawal from Jacobson Reservoir.

c. Drought Average Day = Phase 6 Drought permitted withdrawal from Kentucky River (30 mgd). The extra 5 mgd from the Kentucky River from temporary Permit amendments was not considered. No withdrawals from Jacobson Reservoir were considered because the limited storage in this reservoir could not sustain the permitted withdrawal for more than 30 days during a severe drought.

(3) Treatment capacity for the different conditions is based on the following:

a. Base permitted capacities of Kentucky River WTP (40 mgd) and Richmond Road WTP (25 mgd).

## 4.2 Water Treatment Capacity Deficiencies

The combined reliable water treatment capacity for the Kentucky River Station (KRS) and the Richmond Road Station (RRS) is 65 mgd, including a rated capacity of 40 mgd at the KRS and a rated capacity of 25 mgd at the RRS. Improvements at the RRS in 1992 increased the reliable capacity from 20 to 25 mgd. KAW has demonstrated the ability to operate the KRS and RRS at up to 50 mgd and 30 mgd, respectively, while maintaining good water quality. However, these rates are not considered reliable. For example, the KRS can only produce about 40 mgd during winter due to cold water conditions and contact time (CT) requirements. KDOW has indicated that, if necessary to meet demands, KAW has temporary approval to operate these water treatment plants at higher rates as long as all health standards are met and adequate disinfection is maintained.

KAW does not have rated water treatment capacity to meet projected maximum day demands under all conditions. The 2020 projected maximum day demand for a hot, dry scenario is 80.90 mgd. The highest maximum day demand on record was 71.82 mgd, which occurred in 2002. KAW treated water production capacity at the KRS and RRS facilities is also limited by low service and high service pumping and transmission capacity deficiencies.

Adequacy of production capacity is based on meeting maximum day demands. Rated combined existing treatment capacity at the KRS and the RRS is 65 mgd, although production capacity can be increased depending on water quality conditions. As shown in Table 2, KAW will have a treatment capacity deficit of 9.5 mgd by 2010, 12.7 mgd by 2015, and 15.9 mgd by 2020, based on a combined treatment capacity of 65 mgd. Although the KDOW has previously approved a treatment capacity of 70 mgd on a temporary basis under certain conditions, this additional 5 mgd of rerated treatment capacity is not considered in these projections.

Based on the projected treatment capacity and the source of supply capacity deficiency identified in Section 4.1, KAW requires a 20 mgd water supply solution that would be expandable to 30 mgd within a planning horizon through 2030 or immediately beyond.

## 5.0 WATER SUPPLY ALTERNATIVES

In order to address the identified source of supply and treatment capacity deficiencies, four (4) alternatives were evaluated in this study. These alternatives include the BWSC plan, the Louisville pipeline project, increasing the capacity of the KAW existing facilities, and a KAW Kentucky River Pool 3 WTP project. Descriptions of the four (4) alternatives are provided in this section. Capital cost estimates are also provided in this section for the BWSC plan, the Louisville pipeline project, and increasing the capacity of the KAW existing facilities alternatives. Detailed cost estimates for the KAW Pool 3 WTP alternative are provided in Section 6.0.

### 5.1 Bluegrass Water Supply Consortium (now Commission) Plan

The objectives of the BWSC plan are to develop a means to deliver potable water where needed, bring additional water supplies to augment the existing supplies of BWSC members within 3 to 5 years, and develop a financial and management/ownership approach. The BWSC identified 40 potential alternatives to meet the projected deficit. The selected alternative included a raw water intake, pumping stations, and pipelines from both the Kentucky River and the Ohio River, a 45 mgd water treatment plant, and treated water pipelines forming a "grid network". Much of the proposed plan is conceptual in nature. One of the strongest positive aspects in developing the BWSC plan was the level and methods of public involvement. The selected BWSC plan was not the lowest cost plan for regional service. The lowest cost project would have included bulk purchase of water from the Louisville Water Company and construction of pumping and transmission facilities. Implementation of a Louisville Water Company pipeline project may have faced public or political opposition, however, based on KAW's early efforts on a similar project.

All current members of the BWSC, as well as KAW, projected supply deficits by 2020. However, several of them indicated supply and treatment surpluses in the short term. Prior to formation of the BWSC, KAW approached Frankfort regarding purchase of treated water. These discussions were discontinued after BWSC formation. Phase I of the BWSC plan is the construction of a transmission main between Frankfort and KAW to allow for a supply of up to 5 mgd. No agreement has been executed between the BWSC and Frankfort or the BWSC and

KAW for this additional supply. Furthermore, in 2005 Frankfort experienced a maximum day demand of about 15.8 mgd. The capacity of Frankfort's water treatment plant is 18 mgd. Therefore, 5 mgd may not be available for delivery to KAW under maximum day demand conditions without expansion of the Frankfort water treatment plant. Such an expansion could delay delivery of any firm additional supply from Frankfort to KAW.

No significant amount of additional supply would be available from the BWSC "system" to KAW until the Pool 3 water treatment plant is constructed and put into service. In addition, at least parts of the grid improvements would need to be constructed; some of the proposed pipelines could be delayed with no impact on KAW. A KAW supply deficiency under severe drought conditions currently exists, and timing of the additional supply under the BWSC plan may not be adequate to meet KAW requirements.

Costs associated with the BWSC plan were reviewed in detail. The "original" BWSC plan included a 45 mgd water treatment plant. Because of a reduction in the number of member utilities in the BWSC, and the associated projected demands, the current estimated capacity of the water treatment plant is 31 mgd. Estimates in the O'Brien & Gere report were based on August 2003 costs. Material and construction costs have increased significantly since 2003. The estimated project costs for contingencies (20%), permitting (5%), and project engineering, legal, and administration (20%) appear to be reasonable.

The total project cost estimate for the original (45 mgd) BWSC plan was $265 million, as shown in Table 3. Utilizing August 2005 unit costs and American Water experience for transmission and distribution piping, an opinion of probable cost of $410 million was developed by Gannett Fleming for the original BWSC plan. A breakdown of this opinion of probable cost is provided in Table 4. In a November 2005 letter report, O'Brien & Gere estimated the total cost of a 31 mgd project to be $239 million, as shown in Table 3. This estimate included revised information regarding the required connecting distribution mains to BWSC member systems. Utilizing August 2005 unit costs and American Water experience for transmission and distribution piping, an opinion of probable cost of $280 million was developed by

## Table 3

## BWSC Plan Cost Estimate Summary

| | 45 mgd | 31 mgd |
|---|---|---|
| | | |
| Water Treatment Plant | $56,250,000 | $48,460,000 |
| | | |
| Pumping Stations and Intakes | 22,250,000 | 25,450,000 |
| | | |
| Pipes | 98,180,000 | 60,670,000 |
| | | |
| Subtotal | $176,680,000 | $134,580,000 |
| | | |
| Contingencies (20%) | 35,340,000 | 26,920,000 |
| | | |
| Total Capital Cost | $212,020,000 | $161,500,000 |
| | | |
| Permitting (5%) | 10,600,000 | 8,080,000 |
| | | |
| Engineering, Legal, & Admin (20%) | 42,400,000 | 32,300,000 |
| | | |
| Total Project Cost | $265,020,000 | $201,880,000 |
| | | |
| Phase 1 Pipeline | - | 37,480,000 |
| | | |
| Total Project Cost | $265,020,000 | $239,360,000 |

Costs provided by O'Brien & Gere.

Gannett Fleming for the revised (31 mgd) BWSC plan. A breakdown of this opinion of probable costs is provided in Table 5.

The revised planning level estimated costs for a BWSC plan reflect the decreased number of BWSC members and the associated decreased water treatment plant capacity (from 45 mgd to 31 mgd). The cost estimates also reflect the distribution grid improvements that were deleted because of the revised BWSC membership. Other major differences between the original (45 mgd) and revised (31 mgd) BWSC plans include the reduction of the Ohio River raw water intake and pumping station capacity and the downsizing of the treated water transmission main (from 48 inches to 42 inches). The revised BWSC plan also includes a two-phase approach to construction of the transmission main from the water treatment plant. Neither the 45 mgd plan or the 31 mgd plan appear to include distribution storage along the proposed grid network to help control pressure gradients and equalize flows. Also, neither of the plans appear to include intermediate tank and pumping facilities on the supplemental raw water transmission main from the Ohio River.

Table 4

**Opinion of Probable - Original BWSC Plan**

| Specif. Section | Item Description | Units | Quantity | Material Cost | Labor Cost | Total Unit Cost | Total Item Cost | Total Division Cost |
|---|---|---|---|---|---|---|---|---|
| | INTAKES/RAW WATER PUMP STATIONS | | | | | | | |
| | Intake Structures - Kentucky Pool No. 3 and Ohio | Each | 2 | | | $750,000 | $1,500,000 | |
| | Raw Water Main - Ohio to Pool No. 3 Plant (36-inch) | Lin. Ft. | 200000 | | | $250 | $50,000,000 | |
| | 45 MGD (KR) and 30 MGD (Ohio) RWPS | | | | | | | |
| | Site Work | Each | 2 | | | $500,000 | $1,000,000 | |
| | Structure | Each | 2 | | | $1,500,000 | $3,000,000 | |
| | Pumps (4 pumps each station) | Each | 8 | | | $200,000 | $1,600,000 | |
| | Piping & Valves | Each | 2 | | | $1,000,000 | $2,000,000 | |
| | Mechanical | Each | 2 | | | $500,000 | $1,000,000 | |
| | Electrical | Each | 2 | | | $2,000,000 | $4,000,000 | |
| | | | | | | | SUB TOTAL = | $64,100,000 |
| | WATER TREATMENT PLANT | | | | | | | |
| | Cost per MG of Production Capacity | Each | 45 | | | $1,700,000 | $76,500,000 | |
| | | | | | | | SUB TOTAL = | $76,500,000 |
| | DISTRIBUTION MAINS | | | | | | | |
| | Lexington to Frankfort - 48-inch | Lin. Ft. | 175300 | | | $325 | $56,972,500 | |
| | 3 Pump Stations | Each | 3 | | | $2,500,000 | $7,500,000 | |
| | 2 Master Meters | Each | 2 | | | $500,000 | $1,000,000 | |
| | Shelbyville and Lawrenceburg - 16-inch | Lin. Ft. | 11400 | | | $70 | $798,000 | |
| | Shelbyville and Lawrenceburg - 12-inch | Lin. Ft. | 107100 | | | $45 | $4,819,500 | |
| | 3 Pump Stations | Each | 3 | | | $1,500,000 | $4,500,000 | |
| | 2 Master Meters | Each | 2 | | | $50,000 | $100,000 | |
| | Paris from Lexington - 12-inch | Lin. Ft. | 55400 | | | $45 | $2,493,000 | |
| | Master Meter | Each | 1 | | | $50,000 | $50,000 | |
| | Cynthiana from Georgetown - 12-inch | Lin. Ft. | 76600 | | | $45 | $3,447,000 | |
| | Master Meter | Each | 1 | | | $50,000 | $50,000 | |
| | Winchester from Lexington - 24-inch | Lin. Ft. | 59100 | | | $175 | $10,342,500 | |
| | Master Meter | Each | 1 | | | $100,000 | $100,000 | |
| | Mt. Sterling from Winchester - 8-inch | Lin. Ft. | 79800 | | | $35 | $2,793,000 | |
| | 2 Pump Stations | Each | 2 | | | $1,000,000 | $2,000,000 | |
| | Master Meter | Each | 1 | | | $30,000 | $30,000 | |
| | Nicholasville from Lexington - 24-inch | Lin. Ft. | 39900 | | | $175 | $6,982,500 | |
| | Pump Station | Each | 1 | | | $1,500,000 | $1,500,000 | |
| | Master Meter | Each | 1 | | | $100,000 | $100,000 | |
| | Wilmore from Nicholasville - 12-inch | Lin. Ft. | 15700 | | | $45 | $706,500 | |
| | River Crossing | Each | 1 | | | $100,000 | $100,000 | |
| | Master Meter | Each | 1 | | | $100,000 | $100,000 | |
| | Harrodsburg from Wilmore - 10-inch | Lin. Ft. | 44300 | | | $40 | $1,772,000 | |
| | Pump Station | Each | 1 | | | $1,500,000 | $1,500,000 | |
| | Master Meter | Each | 1 | | | $50,000 | $50,000 | |
| | Danville from Harrodsburg - 10-inch | Lin. Ft. | 36800 | | | $40 | $1,472,000 | |
| | Pump Station | Each | 1 | | | $1,500,000 | $1,500,000 | |
| | Master Meter | Each | 1 | | | $50,000 | $50,000 | |
| | Lancaster from Danville - 10-inch | Lin. Ft. | 57400 | | | $40 | $2,296,000 | |
| | Pump Station | Each | 1 | | | $1,500,000 | $1,500,000 | |
| | River Crossing | Each | 1 | | | $100,000 | $100,000 | |
| | Master Meter | Each | 1 | | | $50,000 | $50,000 | |
| | Richmond from Lexington - 18-inch | Lin. Ft. | 77500 | | | $130 | $10,075,000 | |
| | 2 -Pump Stations | Each | 2 | | | $1,500,000 | $3,000,000 | |
| | River Crossing | Each | 1 | | | $100,000 | $100,000 | |
| | Master Meter | Each | 1 | | | $100,000 | $100,000 | |
| | Berea from Richmond - 8-inch | Lin. Ft. | 51700 | | | $35 | $1,809,500 | |
| | Pump Station | Each | 1 | | | $1,000,000 | $1,000,000 | |
| | Master Meter | Each | 1 | | | $50,000 | $50,000 | |
| | | | | | | | SUB TOTAL = | $132,909,000 |
| | | | | PROBABLE CONSTRUCTION COST | | | | $273,509,000 |
| | | | 20% | CONTINGENCY | | | | $54,701,800 |
| | | | | TOTAL CAPITAL COST | | | | $328,210,800 |
| | | | 5% | PERMITTING | | | | $16,410,540 |
| | | | 20% | ENGINEERING, LEGAL, ADMINISTRATION | | | | $65,642,160 |
| | | | | GRAND TOTAL PROBABLE CONSTRUCTION COST | | | | **$410,263,500** |

Table 5

## Opinion of Probable Cost - Revised BWSC Plan

| Specif. Section | Item Description | Units | Quantity | Material Cost | Labor Cost | Total Unit Cost | Total Item Cost | Total Division Cost |
|---|---|---|---|---|---|---|---|---|
| | INTAKES/RAW WATER PUMP STATIONS | | | | | | | |
| | Intake Structures - Kentucky Pool No. 3 and Ohio | Each | 2 | | | $750,000 | $1,500,000 | |
| | Raw Water Main - Ohio to Pool No. 3 Plant (30-inch) | Lin. Ft. | 158400 | | | 210 | $33,300,000 | |
| | Kentucky River and Ohio River | | | | | | | |
| | Site Work | Each | 2 | | | $500,000 | $1,000,000 | |
| | Structure | Each | 2 | | | $1,500,000 | $3,000,000 | |
| | Pumps (4 pumps each station) | Each | 8 | | | 150000 | $1,200,000 | |
| | Piping & Valves | Each | 2 | | | 750000 | $1,500,000 | |
| | Mechanical | Each | 2 | | | $500,000 | $1,000,000 | |
| | Electrical | Each | 2 | | | $1,700,000 | $3,400,000 | |
| | | | | | | | SUB TOTAL = | $45,900,000 |
| | WATER TREATMENT PLANT | | | | | | | |
| | Cost per MG of Production Capcity | Each | 31 | | | $1,700,000 | $52,700,000 | |
| | | | | | | | SUB TOTAL = | $52,700,000 |
| | TREATED WATER TRANSMISSION MAIN | | | | | | | |
| | Phase 2 Pipeline | Lin. Ft. | 95040 | | | $300 | $28,512,000 | |
| | | | | | | | SUB TOTAL = | $28,500,000 |
| | DISTRIBUTION MAINS | | | | | | | |
| | Paris from Lexington - 12-inch | Lin. Ft. | 83794 | | | $45 | $3,800,000 | |
| | Master Meter | Each | 1 | | | $50,000 | $50,000 | |
| | Cynthiana from Paris - 12-inch | Lin. Ft. | 75821 | | | $45 | $3,400,000 | |
| | Master Meter | Each | 1 | | | $50,000 | $50,000 | |
| | Winchester from Lexington - 24-inch | Lin. Ft. | 116899 | | | $175 | $20,500,000 | |
| | Master Meter | Each | 1 | | | $100,000 | $100,000 | |
| | Mt. Sterling from Winchester - 8-inch | Lin. Ft. | 79464 | | | $35 | $2,800,000 | |
| | 2 Pump Stations | Each | 2 | | | $1,000,000 | $2,000,000 | |
| | Master Meter | Each | 1 | | | $30,000 | $30,000 | |
| | Lancaster from Nicholasville - 10-inch | Lin. Ft. | 106603 | | | $40 | $4,300,000 | |
| | Pump Station | Each | 2 | | | $1,500,000 | $3,000,000 | |
| | River Crossing | Each | 1 | | | $500,000 | $500,000 | |
| | Master Meter | Each | 1 | | | $50,000 | $50,000 | |
| | | | | | | | SUB TOTAL = | $34,800,000 |
| | | | | PROBABLE CONSTRUCTION COST | | | | $161,900,000 |
| | | | 20% | CONTINGENCY | | | | $32,400,000 |
| | | | | TOTAL CAPITAL COST | | | | $194,300,000 |
| | | | 5% | PERMITTING | | | | $9,700,000 |
| | | | 20% | ENGINEERING, LEGAL, ADMINISTRATION | | | | $38,900,000 |
| | | | | **TOTAL PROBABLE CONSTRUCTION COST** | | | | **$242,900,000** |
| | | | | PHASE I PIPELINE | | | | $37,500,000 |
| | | | | **GRAND TOTAL PROBABLE CONSTRUCTION COST** | | | | **$280,400,000** |

The intakes, raw water pump stations, water treatment plant, and transmission main to connect to KAW associated with the BWSC regional plan are required to deliver additional supply to KAW. Transmission/distribution mains will be needed to serve individual systems beyond the KAW system. These mains will not benefit KAW customers. If the estimated costs for all "distribution mains" in the revised BWSC plan (31 mgd) are excluded, the estimated cost for the facilities required to serve KAW is reduced from $239 million to $201 million, as shown below. These costs are based on the information and cost estimates in the November 2005 O'Brien & Gere letter report. A "flow through grid system" would rely on KAW transmission mains to transport water to a central regional location. Difficulties may be experienced in metering and accounting as water is "wheeled" through existing KAW mains.

| | |
|---|---|
| Intakes and Raw Water Pump Stations | $ 25,450,000 |
| Water Treatment Plant | $ 48,460,000 |
| Pipelines | $ 34,980,000 |
| **Sub Total** | $108,890,000 |
| Contingencies (20%) | $ 21,780,000 |
| **Total Capital Cost** | $130,670,000 |
| Permitting (5%) | $ 6,530,000 |
| Engineering, Legal, and Administration (20%) | $ 26,130,000 |
| **Total Project Cost** | $163,330,000 |
| Phase 1 Pipeline | $ 37,480,000 |
| **Total Project Cost** | $200,810,000 |

The first phase (Phase I) of a BWSC project would provide for a connection between Frankfort and KAW to enable Frankfort (BWSC) treated water to be supplied to KAW. Subsequent phases would construct facilities to deliver additional BWSC water to the Phase I transmission main, which would be a primary component of the grid network. The estimated cost of the Phase I improvements is $37,480,000, as provided in the November 2005 O'Brien & Gere letter report, as developed by R&R Engineers in a Water Main Routing Study.

KAW entered into a non-binding commitment with the BWSC for 22 mgd from the BWSC regional system. Under the BWSC plan, KAW would secure an additional 22 mgd supply without investing a large amount of capital. It is understood that project costs would be paid through "take or pay" contracts between the BWSC and recipients of the supply. The terms of the contract have not been finalized; however, a draft agreement dated October 6, 2005 was available for review. Under the terms of the draft agreement, each utility would pay an annual fee of $500,000 per mgd of committed capacity, for which it would receive 20% of the committed capacity (4.4 mgd in the case of KAW). All use above this amount would be billed at $0.75 per 1,000 gallons.

Some of the disadvantages to KAW associated with the BWSC plan were identified as part of this study and include:

- KAW must develop an additional water supply within a set timeframe, and BWSC plan progress through 2006 has been limited.
- Grid improvements would not benefit KAW customers, but KAW customers could be indirectly funding these improvements.
- Because KAW's transmission and distribution system will be part of the regional "grid", water from other systems will be transported through KAW's water system, which could cause water quality problems.
- KAW is not permitted to be a voting member of the BWSC although it would be the largest user of the system.

## 5.2 Louisville Pipeline Project

KAW planning studies conducted more than 10 years ago identified an alternative to supply treated water from the Louisville Water Company to KAW via a dedicated pipeline as the least cost option to obtain the water supply needed to meet KAW customer demands. This analysis was confirmed when the February 2004 O'Brien & Gere report concluded that a treated water pipeline from the Louisville Water Company would be the least cost option to supply the water needs of the region.

In order to compare a Louisville pipeline project with the BWSC plan, costs were updated to reflect current levels. No verification of Louisville's ability to provide the amounts of water needed by KAW or the facilities required to implement this alternative was made for this study.

Major components for the two (2) parts of the Louisville pipeline project that were previously identified in 1999 include:

Louisville Water Company (LWC) facilities

- 9,000 feet 60-inch and 48-inch main
- New booster pumping station
- 68,000 feet 36-inch main
- New distribution storage tank

KAW facilities

- 260,000 feet 36-inch main
- Two new booster pumping stations, with one booster station to have chemical feed facilities for ammonia, chlorine, and corrosion inhibitor
- Retention basin (for containment, settling, and slow release of water flushed from transmission main)

Estimated Louisville pipeline project costs, based on August 2005 cost levels, are presented below:

| | |
|---|---|
| Louisville Water Company facilities | |
| Pipeline | $ 22,000,000 |
| Booster Pumping Station | $ 3,000,000 |
| Tank | $ 2,000,000 |
| Sub Total | $ 27,000,000 |
| Contingencies (20%) | $ 5,400,000 |
| Total Capital Cost | $ 32,400,000 |
| Permitting (5%) | $ 1,600,000 |
| Engineering, Legal, and Administrative (20%) | $ 6,500,000 |
| Total LWC Cost | $ 40,500,000 |
| KAW facilities | |
| Pipeline | $ 70,000,000 |
| Booster Station No. 1 | $ 5,400,000 |
| Booster Station No. 2 | $ 3,600,000 |
| Retention Basin | $ 1,000,000 |
| Sub Total | $ 80,000,000 |
| Contingencies (included) | $ 0 |
| Total Capital Cost | $ 80,000,000 |
| Permitting (5%) | $ 4,000,000 |
| Engineering, Legal, and Administration (20%) | $ 16,000,000 |
| Total KAW Cost | $100,000,000 |
| **Total Project Cost** | $140,500,000 |

Note that these costs are based on providing adequate supply only to KAW. They do not include adequate capacity or any of the required grid network piping associated with a regional system. Although the capital cost of the Louisville pipeline project alternative has been shown to be the least-cost alternative to provide KAW with additional supply, there are several disadvantages associated with this alternative. When KAW pursued this alternative previously, local public and political opposition was experienced, causing KAW to discontinue the project. LFUCG indicated a preference that the Kentucky River be used as the primary source of supply for the central Kentucky region. The Louisville pipeline project would utilize Ohio River water. These non-economic factors need to be considered in the evaluation of water supply alternatives.

### 5.3 Increase KAW Existing Facilities Capacity

One alternative investigated in this study was increasing the capacity of the KAW pumping, transmission, and treatment facilities to meet the projected 2020 maximum day demand of 80 mgd. These improvements, however, would not increase the "safe yield" of the Kentucky River, although they would enable KAW to meet projected demands of up to 80 mgd when water is available in the Kentucky River. For short-duration Kentucky River source of supply deficiencies, water from Jacobson Reservoir can be utilized to meet demands (500 Mgal capacity, 16 mgd permitted withdrawal rate). However, as shown in Table 2, for a drought average day scenario, supply from Jacobson Reservoir is not considered to be available. In addition, only 30 mgd is considered to be available in the Kentucky River under this scenario.

A summary of the estimated costs to improve KAW facilities to supply 80 mgd, as provided by KAW, is shown in Table 6.

**Table 6**

**Opinion of Probable Cost - KAW Existing Facilities Upgrades**

| Location/Facility | Cost |
|---|---|
| | |
| Kentucky River Intake and Raw Water Pump Station | $14,500,000 |
| Kentucky River Station | $12,700,000 |
| Kentucky River Station to Jacobson Reservoir Transmission Main | $13,500,000 |
| Jacobson Reservoir to Richmond Road Station | $ 4,200,000 |
| Richmond Road Station | $ 4,500,000 |
| Distribution System | $ 8,800,000 |
| Sub-Total Construction Cost | $58,200,000 |
| Contingency (20%) | $11,600,000 |
| Total Construction Cost | $69,800,000 |
| Engineering, Administration, Permitting (15%) | $10,500,000 |
| Total Project Cost | $80,300,000 |

Because the permitted withdrawal from the Kentucky River can be reduced to 30 mgd during extreme droughts, it is not economically feasible to invest $80 million in improvements in the existing facilities to provide 80 mgd capacity. Rather, in 2006 KAW implemented a $5 million rehabilitation program that would also improve reliability to utilize Kentucky River water when it is available. Three (3) projects are included in this program: installation of additional auxiliary power at the RRS to increase the high service pumping capacity to 22 mgd, including a generator and electric switch gear for the existing 6 mgd pump; replacement of the existing raw water pumps at the KRS Intake, including six (6) new 14.4 mgd pumps; and replacement of the two (2) existing pumps and installation of a new pump, motor, electrical equipment, and controls in the Raw Water Transfer Pumping Station to provide 18 mgd reliable capacity.

## 5.4 KAW Kentucky River Pool 3 WTP

Another alternative investigated in this study involved construction by KAW of an intake in Pool 3 of the Kentucky River, a treatment plant, and high service pumping and transmission facilities to connect to the existing KAW distribution system.

The intake location for the KAW project would be upstream from Lock and Dam 3 in Pool 3 of the Kentucky River. There are no known permitted withdrawers downstream from the potential KAW intake location. Based on U.S. Geological Survey data collected at Lock 2, the minimum flow during the 1930 drought was about 13 mgd (before construction of upstream reservoirs), and during the 1999 drought was about 80 mgd. Flow at Lock 2 takes advantage of 6,180 square miles of drainage area, and would include all upriver return flows. An evaluation of the safe yield of the Kentucky River at Lock 2 is provided in Appendix A.

The WTP would have a 20 mgd capacity, expandable to 30 mgd. The raw water intake and pumping station would be located at a site adjacent to Pool 3, which has a normal water level of El. 457. From the intake forebay, raw water would flow by gravity through a 42-inch main to the raw water pumping station, which would have a floor elevation above the 1937 flood level. Raw water would be pumped to the WTP through a 42-inch main. Preliminary design criteria for the raw water facilities are provided in Appendix B.

Based on Kentucky River raw water quality data and preliminary discussions with KDOW, two (2) treatment processes, both in accordance with KAW requirements and judged to be capable of meeting regulatory requirements, were evaluated for this study:

- Flocculation - Plate Settler Clarification - Filtration - Chlorine Disinfection
- ACTIFLO® Filtration - Chlorine Disinfection

Provisions for future UV disinfection were included with each process to provide a process capable of the highest level of disinfection that could be necessary based on future source water sampling for *Cryptosporidum.*

The flocculation-plate settler clarification process was used as the basis of design for the 20 mgd WTP facility. The opinions of probable costs for the WTP in this study were developed assuming this process.

Components included at the WTP would include an Administration Building, Chemical Storage and Feed Facilities, Treatment Process Facilities, a Treated Water Pumping Station, Wastewater and Residuals Handling Facilities, an Instrumentation and Control System, a Telemetry System, and other Special Systems (Security, Fire Detection, etc.). Preliminary design criteria for the WTP components are provided in Appendix B.

As part of this study, potential combinations of intake sites, WTP sites, and treated water transmission main routes were identified. The locations of the intake, raw water pumping station, raw water main, WTP and high service pumping station, intermediate storage tank and booster pumping station, and treated water main for the various alternatives are described in Appendix C. The terminal point of the treated water main is the same for each alternative. To the extent possible, treated water transmission main routes follow existing roads, highways, or power lines.

The WTP was planned to have an ultimate capacity of 30 mgd. Both 36-inch and 42-inch main sizes were investigated in this evaluation. At 30 mgd, velocity in a 36-inch main is about 6.6 ft/sec and in a 42-inch main is about 4.9 ft/sec. If the WTP capacity is increased from 20 mgd to 30 mgd in the future, pressure in a 36-inch transmission main would exceed 300 psi at lower elevations. For 36-inch main, multiple intermediate storage tanks and booster pumping stations would be required at both 20 mgd and 30 mgd to limit pressure to acceptable levels. Because of the need for additional booster pumping stations and the velocity and associated head losses in a 36-inch main at 20 or 30 mgd, 42-inch main was used to evaluate potential projects, which is the same size main used in the revised BWSC plan. Hydraulic grade lines were developed for 42-inch main for each of the potential routes investigated in this study. An intermediate storage tank and booster pumping station would be required for each potential route because of the length of the treated water main and the associated headloss at maximum flow rates and the ground profile of the route.

Five (5) potential intake/raw water pumping station (RWPS) sites and six (6) potential water treatment plant (WTP) sites were preliminarily identified, as described in Appendix C. Four (4) combinations of these sites and six (6) treated water transmission main routes were evaluated in detail, the results of which are provided in Appendix C. The RWPS#2 and WTP#3 potential sites were eliminated from consideration during preliminary screening of alternatives.

Potential WTP sites were identified to take advantage of higher elevation areas near the identified river intake and raw water pumping station locations. Potential WTP sites were located at elevations El. 780. (WTP#1), El. 720 (WTP#2), El. 820 (WTP#4), El. 760 (WTP#5), and El. 720 (WTP#6), based on USGS topographic data, as shown in the respective exhibits. Two (2) primary treated water transmission main routes were identified from the potential WTP sites to the termination point in the KAW Central Division distribution system, which includes Lexington-Fayette County and parts of six (6) surrounding counties. These routes are identified as the Stamping Ground route and the Peaks Mill route. Both routes would require an intermediate storage tank and booster pumping station. The termination point of both routes was located at the intersection of Ironworks Pike and Newtown Pike.

Hydraulic grade lines (HGL) were developed for the alternative KAW water supply projects and are shown on the respective exhibits. Two (2) HGL are shown on each exhibit. The first is for 20 mgd and the second is for 30 mgd; both use a C factor of 120. Because of the ground elevation along both of the routes, at 20 mgd the maximum pressure at the lowest elevations along the routes could exceed 200 psi for 42-inch main, as shown on the respective exhibits.

## 6.0 KAW POOL 3 WTP ALTERNATIVE OPINION OF PROBABLE PROJECT COSTS

### 6.1 Intake, Raw Water Pumping Station, WTP, and High Service Pumping Station

Opinions of probable cost for the proposed intake, raw water pumping station, WTP, and high service pumping station were developed by estimating material and equipment quantities for the proposed facilities and applying unit costs based on past projects and RS Means Building Construction Cost Data Year 2006. Electrical and mechanical costs were estimated as a percentage of the total general contract, which estimates were based on a comparative project that included emergency generators at two sites and new electrical services. Contractor overhead and profit was estimated as a percentage of the project construction cost. An electric service fee was included to provide high voltage service to the water treatment plant site. The construction costs, in 2006 dollars, are summarized in Table 7 for the identified components.

**Table 7**

**Intake, Raw Water Pumping Station, Water Treatment Plant, and High Service Pumping Station Opinion of Probable Construction Costs**

| Description | | 20 mgd |
|---|---|---|
| Site Work | | $ 1,321,000 |
| Raw Water Intake and Pumping Station | | $ 3,205,000 |
| Pretreatment | | $ 3,463,000 |
| Filtration | | $ 5,432,000 |
| Finished Water Storage | | $ 2,185,000 |
| High Service Pumping | | $ 1,833,000 |
| Chemical/Administration | | $ 3,593,000 |
| Wastewater and Residuals Handling | | $ 4,935,000 |
| Subtotal | | $25,967,000 |
| Mechanical | 7% | $ 1,818,000 |
| Electrical | 20% | $ 5,193,000 |
| Subtotal | | $32,978,000 |
| Contractor overhead and profit | 20% | $ 6,596,000 |
| Electric Service Fee | | $ 3,000,000 |
| Subtotal | | $42,574,000 |
| Contingency | 20% | $ 8,575,000 |
| Total (2006 Dollars) | | $51,089,000 |

The cost adder for presedimentation facilities for the 20 mgd WTP would be $2,550,000 (in 2006 dollars). This cost includes all percentages.

The cost adder for UV disinfection facilities for the 20 mgd WTP would be $4,675,000 (in 2006 dollars). This cost includes all percentages.

### 6.2 Raw Water Main, Treated Water Main, Storage Tank, and Booster Pumping Station

Opinions of probable construction cost for transmission facilities associated with the alternative KAW Pool 3 WTP projects were developed as part of this study. A unit cost of $300/ft for 42-inch main was used in the analysis. The estimated construction cost of the intermediate storage tank and booster pumping station would be the same for all routes. Therefore, the difference in cost between the routes would be dependent only on the required length of raw and treated water transmission main for each route. The construction costs, in 2006 dollars, are summarized in Table 8 for the identified components.

### 6.3 KAW Pool 3 WTP and Associated Facilities Construction Cost Summary

Opinions of probable construction costs were developed for the individual facilities associated with the KAW Pool 3 WTP water supply alternatives, as provided in Tables 7 and 8. Table 9 provides a construction cost summary (in 2006 dollars) for the 20 mgd WTP and other facilities, including nominal property acquisition, for each of the potential treated water transmission main routes. Total construction costs would range from about $116,500,000 to $126,500,000 (in 2006 dollars), as shown in Table 9.

### 6.4 KAW Pool 3 WTP and Associated Facilities Project Cost Summary

Project costs were estimated to be 125% of construction costs to allow for permitting, engineering, legal, and administrative fees. Table 10 provides a project cost summary (in 2006 dollars) for the 20 mgd WTP and other facilities for the various alternatives. Total project costs would range from about $145,500,000 to $158,000,000 (in 2006 dollars).

## Table 8

**Raw Water Main, Treated Water Main, Storage Tank, and Booster Pumping Station Opinion of Probable Construction Costs**

| Description | RWPS#1/WTP#1 (Stamping Ground-Road) | RWPS#1/WTP#1 (Stamping Ground-ROW) | RWPS#3/WTP#4 (Stamping Ground-Road) | RWPS#3/WTP#4 (Peaks Mill) | RWPS#4/WTP#5 (Peaks Mill) | RWPS#5/WTP#6 (Peaks Mill) |
|---|---|---|---|---|---|---|
| Raw Water Main | $ 6,447,000 | $ 6,447,000 | $ 3,485,000 | $ 3,485,000 | $ 887,000 | $ 2,740,000 |
| Treated Water Main | $51,322,000 | $49,452,000 | $53,191,000 | $51,559,000 | $48,470,000 | $46,744,000 |
| Additional Borings | $ 240,000 | $ 240,000 | $ 240,000 | $ 240,000 | $ 240,000 | $ 240,000 |
| Storage Tank (3 Mgal) | $ 2,100,000 | $ 2,100,000 | $ 2,100,000 | $ 2,100,000 | $ 2,100,000 | $ 2,100,000 |
| Booster Pumping Station | $ 2,500,000 | $ 2,500,000 | $ 2,500,000 | $ 2,500,000 | $ 2,500,000 | $ 2,500,000 |
| Subtotal | $62,609,000 | $60,739,000 | $61,516,000 | $59,884,000 | $54,197,000 | $54,324,000 |
| Contingency (20%) | $12,522,000 | $12,148,000 | $12,303,000 | $11,977,000 | $10,839,000 | $10,865,000 |
| Total (2006 Dollars) | $75,131,000 | $72,887,000 | $73,819,000 | $71,861,000 | $65,036,000 | $65,189,000 |

## Table 9

## KAW Pool 3 WTP Alternatives Construction Cost Summary

| Description | RWPS#1/WTP#1 (Stamping Ground-Road) | RWPS#1/WTP#1 (Stamping Ground-ROW) | RWPS#3/WTP#4 (Stamping Ground-Road) | RWPS#3/WTP#4 (Peaks Mill) | RWPS#4/WTP#5 (Peaks Mill) | RWPS#5/WTP#6 (Peaks Mill) |
|---|---|---|---|---|---|---|
| Intake, Raw Water Pumping Station, and Raw Water Main (including nominal property acquisition) | $ 14,251,000 | $ 14,251,000 | $ 10,696,000 | $ 10,696,000 | $ 7,579,000 | $ 9,802,000 |
| WTP and High Service Pumping Station (including nominal property acquisition) | $44,774,000 | $ 44,774,000 | $ 44,774,000 | $ 44,774,000 | $ 44,774,000 | $ 44,774,000 |
| Treated Water Main, Storage Tank, and Booster Pumping Station (including nominal property acquisition) | $67,444,000 | $ 65,202,000 | $ 69,687,000 | $ 67,729,000 | $ 64,022,000 | $ 61,951,000 |
| Construction Cost Total (2006 Dollars) | $126,469,000 | $124,227,000 | $125,157,000 | $123,199,000 | 116,375,000 | $116,527,000 |

**Table 10**

**KAW Pool 3 WTP Alternatives Project Cost Summary**

| | RWPS#1/WTP#1 (Stamping Ground-Road) | RWPS#1/WTP#1 (Stamping Ground-ROW) | RWPS#3/WTP#4 (Stamping Ground-Road) | RWPS#3/WTP#4 (Peaks Mill) | RWPS#4/WTP#5 (Peaks Mill) | RWPS#5/WTP#6 (Peaks Mill) |
|---|---|---|---|---|---|---|
| | | | | | | |
| 20 mgd WTP and associated facilities construction cost[(1)] | $126,469,000 | $124,227,000 | $125,157,000 | $123,199,000 | $116,375,000 | $116,527,000 |
| | | | | | | |
| Permitting, engineering, legal, and administrative fees (25%) | $ 31,617,000 | $31,057,000 | $ 31,289,000 | $30,800,000 | $29,094,000 | $29,132,000 |
| | | | | | | |
| Total Project Cost (in 2006 dollars) | $158,086,000 | $155,284,000 | $156,446,000 | $153,999,000 | $145,469,000 | $145,659,000 |

(1) From Table 9.

## 6.5 Additional Capital Project Costs

All of the transmission main routes for the Pool 3 WTP alternatives would terminate in a part of the existing KAW distribution system that may require hydraulic improvements to accommodate the additional supply. Based on information from KAW, 7.8 miles of 24-inch main would be required. A construction cost estimate of $7,207,000 was developed, based on a unit cost of $175 per foot. Adding a 20% contingency and 25% for permitting, engineering, legal, and administrative fees, the capital project cost for the hydraulic improvements would be about $10,810,000, in 2006 dollars.

A regional water supply project would need to include "grid" improvements that would enable delivery of water supply to other systems. Certain existing KAW mains would be used to convey water to outlying systems. However, additional improvements would also be required. Main extensions and other facilities required to extend service from the KAW system were identified by KAW. A listing of the delivery point, required improvement, and estimated cost is provided in Table 11. The total construction cost estimate for these improvements, as provided by KAW, is $31,551,000, which includes a 20% contingency. Adding 25% for permitting, engineering, legal, and administrative fees, the capital project cost for the improvements would be about $39,438,000, in 2006 dollars.

**Table 11**

**Potential Grid Improvements**

| Connection to: | Pipe Size (Inches) | Length (feet) | Unit Cost | Construction Cost |
|---|---|---|---|---|
| Frankfort | 16 | 528 | $70/ft | $ 36,960 |
| Georgetown | 8 | 528 | $35/ft | $ 18,480 |
| Nicholasville | 16 | 21,120 | $70/ft | $ 1,478,400 |
| Winchester | 20 | 89,760 | $140/ft | $12,566,400 |
| Winchester | ---- | Pumping Station Upgrade | LS | $ 150,000 |
| Mt. Sterling | 12 | 80,256 | $45/ft | $ 3,611,520 |
| Mt. Sterling | ---- | New Pumping Station | LS | $ 350,000 |
| Paris | 12 | 7,392 | $45/ft | $ 332,640 |
| Cynthiana | 12 | 44,352 | $45/ft | $ 1,995,840 |
| Lancaster | 12 | 105,600 | $45/ft | $ 4,752,000 |
| Lancaster | --- | New Pumping Station | LS | $ 1,000,000 |
| | | Subtotal | | $26,292,240 |
| | | Contingency (20%) | | $ 5,258,448 |
| | | Construction Cost | | $31,550,688 |
| | | Permitting (5%) | | $ 1,577,534 |
| | | Engr/Legal/Admin (20%) | | $ 6,310,138 |
| | | Project Cost | | $39,438,360 |

# 7.0 COMPARISON OF WATER SUPPLY ALTERNATIVE COSTS

## 7.1 Present Worth of Capital Project Costs

### *7.1.1 BWSC Alternative*

The "original" BWSC regional water supply plan included a 45 mgd water treatment plant. Because of the reduction in the number of member utilities in the BWSC, and the associated projected demands, the revised estimated capacity of the water treatment plant is 31 mgd.

The total project cost estimate for the "original" (45 mgd) BWSC plan was $265,000,000, based on August 2003 costs and including provisions for contingencies (20%), permitting (5%), and project engineering, legal, and administrative services (20%). Utilizing August 2005 unit costs and American Water experience for transmission and distribution piping, Gannett Fleming estimated the August 2005 cost of the "original" (45 mgd) BWSC plan to be about $410,000,000.

Information received from BWSC (O'Brien & Gere November 2005 letter report) indicated that the total capital project cost for a 31 mgd water treatment plant project would be $239,336,000. This estimate included revised information regarding the required connecting distribution mains to BWSC member systems. Utilizing August 2005 unit costs and American Water experience for transmission and distribution piping, Gannett Fleming estimated the cost of the revised (31 mgd) BWSC plan to be $280,400,000.

The revised planning level estimated costs for a BWSC plan reflect the reduced number of BWSC members and the associated reduced water treatment plant capacity (from 45 mgd to 31 mgd). The cost estimates also reflect the distribution grid improvements that were deleted because of the revised BWSC membership. Other major differences between the original (45 mgd) and revised (31 mgd) BWSC plans include the reduction of the Ohio River raw water intake and pumping station capacity and the downsizing of the treated water transmission main from the WTP from 48 inches to 42 inches. The revised BWSC plan also includes a two-phase approach to construction of the transmission main from the water treatment plant to Lexington.

The first phase (Phase I) would provide for a connection between Frankfort and KAW to enable Frankfort (BWSC) treated water to be supplied to KAW. Subsequent phases would construct facilities to deliver additional BWSC water to the Phase I transmission main, which would be a primary component of the grid network. The estimated cost of the Phase I improvements is $37,480,000, as provided in the November 2005 O'Brien & Gere letter report, as developed by R&R Engineers in a Water Main Routing Study.

An analysis was performed on the O'Brien & Gere-estimated capital project cost of the revised BWSC plan to determine the present worth value, assuming the project costs would be incurred by BWSC in 2008, with operation to begin in 2010. The inflation rate for project cost was assumed to be 3% annually, and the investment rate of capital was assumed to be 6%. For the revised (31 mgd) BWSC plan, the O'Brien & Gere-estimated project cost is $239,336,000. Inflating this amount annually for 2 years (to 2008) increases the opinion of probable cost to $253,912,000. The amount needed to be invested in 2006 at a 6% rate to provide $253,912,000 in 2008 is $225,981,000. Therefore, the present worth of the capital project cost for the revised (31 mgd) BWSC plan is $225,981,000.

KAW previously entered into a non-binding commitment with the BWSC for 22 mgd from the BWSC regional system. This 22 mgd non-binding commitment was used by the BWSC in establishing the 31 mgd capacity of the BWSC WTP. If the present worth of the capital project cost for the revised (31 mgd) BWSC plan were to be divided among the participants based on their respective non-binding commitments, then KAW would be responsible for 22/31 of the capital project cost present worth ($160,374,000).

### *7.1.2 Louisville Pipeline Alternative*

Gannett Fleming updated the opinion of probable project cost for the facilities required to construct a pipeline between the Louisville Water Company (Louisville) and KAW for bulk water supply. The facilities and their respective costs are shown in Section 5.2. Based on this update, the opinion of probable project cost for the Louisville pipeline project is estimated to be about $140,500,000, in 2005 dollars.

Similar to the BWSC alternative, it was assumed that the Louisville pipeline project costs would be incurred in 2008, with operation to begin in 2010. An analysis was performed on the capital project cost to determine a present worth value. The inflation rate for project cost was assumed to be 3% annually, and the investment rate of capital was assumed to be 6%.

For the Louisville pipeline project, the estimated capital project cost (in 2005 dollars) is $140,500,000. Inflating this amount annually for 3 years (to 2008) increases the opinion of probable cost to $153,528,000. The amount needed to be invested in 2006 at a 6% rate to provide $153,528,000 in 2008 is $136,640,000. Therefore, the 2006 present worth of the capital project cost for the Louisville pipeline project alternative is $136,640,000.

*7.1.3 KAW Pool 3 WTP Alternatives*

All opinions of probable construction and project costs for the KAW Pool 3 WTP alternatives were developed using 2006 dollars. However, actual construction of the required facilities to implement any of these water supply alternatives would occur in the future. Therefore, an analysis was performed on the estimated capital project costs to determine a present worth value. It was assumed that the initial KAW Pool 3 WTP project costs would be incurred in 2008. Operation of the 20 mgd WTP project was assumed to begin in 2010. The inflation rate for project costs was assumed to be 3% annually, and the investment rate of capital was assumed to be 6%.

Present worth values for the KAW Pool 3 WTP alternatives are provided in Table 12. As shown, the values in Table 12 are about 94.42% of the Total Project Cost values in Table 10 because of the difference between the inflation rate (3%) and the investment rate of capital (6%).

### Table 12

### KAW Pool 3 WTP Alternatives Capital Project Present Worth Cost Summary

| Project | Present Worth(1) |
|---|---|
| RWPS#1/WTP#1 (Stamping Ground-Road) | $149,264,000 |
| RWPS#1/WTP#1 (Stamping Ground-ROW) | $146,619,000 |
| RWPS#3/WTP#4 (Stamping Ground-Road) | $147,716,000 |
| RWPS#3/WTP#4 (Peaks Mill) | $145,406,000 |
| RWPS#4/WTP#5 (Peaks Mill) | $137,351,000 |
| RWPS#5/WTP#6 (Peaks Mill) | $137,531,000 |

(1) Based on Total Project Cost from Table 10, an inflation rate of 3%, and an investment rate of capital of 6%. Present worth value (in 2006 dollars) assumes project construction in 2008.

The KAW Pool 3 WTP alternatives present worth values considered the following factors:

- Intake and raw water pumping station on the Kentucky River
- No supplemental supply from the Ohio River
- 20 mgd WTP and high service pumping station, expandable to 30 mgd
- 42-inch transmission main to the KAW Central Division distribution system
- Intermediate 3 Mgal storage tank and booster pumping station

## 7.2 Annual Costs

Water supply alternatives investigated in this water supply study, including the BWSC plan, the Louisville plan, and the KAW Pool 3 WTP plan, would have annual costs associated with them. For the KAW Pool 3 WTP alternatives, there will be annual operation and maintenance costs. For the BWSC regional water supply alternative, the annual cost would be in the form of bulk supply cost. For the Louisville pipeline alternative, the annual cost would be a combination of bulk supply cost and KAW pumping cost for conveying the water through the transmission main to the Central Division distribution system. For the purposes of this study, a

21-year period (2010-2030) was used to compare costs. Because KAW would use water from any of the supply alternatives only on a limited basis, a constant flow of 4.4 mgd was used to estimate annual costs for each alternative. This value was used based on the 22 mgd non-binding commitment KAW entered into with the BWSC, under which KAW would receive 20% of the commitment (4.4 mgd) as a base flow.

*7.2.1 BWSC Alternative*

Appendix A to Water Purchase Agreement (Services, Terms, Definitions, and Computation of Billing Rates), Draft 10/6/05, provided by KAW, indicated that KAW would be billed a Unit Capacity Fee of $500,000 per mgd of committed capacity, regardless of the BWSC project capital cost. Based on a 22 mgd committed capacity, the Unit Capacity Fee would be $11,000,000 per year. For this amount, KAW would be provided a Minimum Daily Allotment of 4.4 mgd (20% of committed capacity). All usage above the Minimum Daily Allotment would be billed at the Standard Wholesale Unit Rate of $0.75 per 1,000 gallons. For alternative comparison purposes, flow was maintained constant at 4.4 mgd from 2010 through 2030. The annual bulk purchase cost for each year during the period would be $11,000,000 (Unit Capacity Fee). At 4.4 mgd, there would be no water provided above the Minimum Daily Allottment. No mechanism to increase the Unit Capacity Fee or the Standard Wholesale Unit Rate was included in the draft Agreement.

The O'Brien & Gere-estimated project cost for the revised (31 mgd) BWSC plan is $239,336,000. The annual debt service on this amount considering a 5% interest rate and a 30-year term would be $15,569,000. The Unit Capacity Fee identified in the draft Agreement is $500,000 per mgd of committed capacity. For the 31 mgd BWSC plan, $15,500,000 per year would be generated if all 31 mgd were to be committed at the identified Unit Capacity Fee. As shown, the revenue generated by the terms of the draft Agreement would not be sufficient to cover debt service <u>and</u> annual operations costs of the WTP and other facilities. Therefore, for alternative comparison purposes, the KAW annual costs for participation in the revised BWSC plan would be a percentage of the total costs based on committed capacity.

Annual operating costs for a 31 mgd WTP BWSC project were estimated for 2010 to 2030. The operating costs were based on the WTP operating at 6.2 mgd (20% of 31 mgd), which is the capacity that would be provided to bulk customers of the BWSC associated with the Unit Capacity Fee. In addition, a $200,000 annual maintenance fee was included in 2010 to cover other facilities. This amount was inflated by 3% on an annual basis. Similar to the capital project costs, if the total annual costs estimated for the BWSC plan were to be divided among the participants based on their respective non-binding commitments, then KAW would be responsible for 22/31 of the annual costs for operation and maintenance of BWSC facilities. Annual costs representing the KAW portion of the BWSC plan annual costs under this scenario are shown on Table 13.

*7.2.2 Louisville Pipeline Alternative*

The annual cost associated with the Louisville pipeline project is a combination of the bulk purchase cost of water charged by the Louisville Water Company and the KAW pumping cost. Based on information contained in the 1998 Agreement between KAW and the Louisville Water Company, the bulk rate would be $0.75 per 1,000 gallons (using 1997 data). It is not known if the terms of this Agreement are still valid. No contact was made with the Louisville Water Company as part of this study. For alternative comparison purposes, flow was maintained constant at 4.4 mgd from 2010 through 2030. An increase of 3% per year in the bulk rate was included in the projected annual costs. KAW annual pumping cost is estimated to be $200,000 in 2010, and is projected to increase 3% per year. The annual KAW bulk purchase and pumping costs under this alternative are shown in Table 13.

*7.2.3 KAW Pool 3 WTP Alternatives*

Each of the KAW Pool 3 WTP water supply alternatives investigated in this study would have annual operation and maintenance costs associated with them. A constant flow of 4.4 mgd was used to estimate annual operating and maintenance costs for a 20 mgd KAW WTP.

Annual operation and maintenance costs for the KAW Pool 3 WTP alternative include general and process power, chemicals usage, and labor. The following assumptions were used in estimating the annual costs:

- Process power costs were developed by estimating kilowatt hour usage based on major motor utilization and include major pumps, mixers, and solids handling and dewatering equipment. Costs were based on production of 4.4 mgd from the beginning of 2010 through 2030.

- General power costs were based on 0.003 kilowatt hour per square foot (kwh/sf) of building area.
- Power costs were based on a 2006 unit cost of $0.049 per kwh. An annual inflation rate of 3% was used to increase the cost of power.
- Chemical costs were based on average dose and production and unit costs provided for chemicals used at the Kentucky River Station.
- Labor costs assumed one (1) operator per shift and a supervisor and a maintenance person for a single shift. Annual staffing requirements were based on 48 weeks per person and were rounded up so as to include one (1) supervisor, five (5) operators, and two (2) maintenance workers. Hourly rates, including all overhead, for the supervisor, operators, and maintenance personnel were $50, $30, and $30, respectively.
- No residuals disposal costs were included.
- Annual maintenance cost, excluding labor, is estimated to be $200,000 in 2010. Maintenance cost was inflated by 3% per year.

The annual operation and maintenance cost for a KAW Pool 3 WTP water supply alternative for 2010, the first year of operation, is estimated to be $1,185,771, which includes $985,771 in operating costs and $200,000 in maintenance costs, as shown in Table 13.

# Table 13

## Annual Cost and Present Worth of Water Supply Alternatives

| | | | | |
|---|---|---|---|---|
| Inflation Rate: | 3% | | BWSC Unit Capacity Cost: | $11,000,000 per year |
| Investment Rate: | 6% | | BWSC Allotment: | 4.4 mgd (22 mgd x 20%) |
| Initial Flow: | 4.4 | mgd | BWSC Standard Wholesale Unit Rate: | $0.75 per 1,000 gallons above allotment |
| Final Flow: | 4.4 | mgd | Louisville Bulk Rate: | $0.75 per 1,000 gallons |
| Present Worth Year: | 2006 | | WTP Annual Maintenance Cost: | $200,000 in 2010 (inflated 3% each year) |

| | | Annual Cost | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | Flow | Future | | | Present Worth - 2006 | | | KAW Pool 3 WTP Annual | LWC Project Annual |
| Year | (mgd) | Pool 3 WTP | BWSC | Louisville | Pool 3 WTP | BWSC | Louisville | Operating Costs | Pumping Costs |
| 2010 | 4.4 | $1,185,771 | $937,780 | $1,404,500 | $939,242 | $742,810 | $1,112,496 | $985,771 | $200,000 |
| 2011 | 4.4 | $1,219,665 | $965,909 | $1,446,635 | $911,404 | $721,783 | $1,081,010 | $1,013,665 | $206,000 |
| 2012 | 4.4 | $1,256,321 | $994,886 | $1,490,034 | $885,657 | $701,356 | $1,050,415 | $1,044,141 | $212,180 |
| 2013 | 4.4 | $1,294,081 | $1,024,733 | $1,534,735 | $860,638 | $681,506 | $1,020,686 | $1,075,535 | $218,545 |
| 2014 | 4.4 | $1,332,978 | $1,055,475 | $1,580,777 | $836,327 | $662,218 | $991,799 | $1,107,876 | $225,102 |
| 2015 | 4.4 | $1,373,046 | $1,087,139 | $1,628,200 | $812,704 | $643,476 | $963,729 | $1,141,191 | $231,855 |
| 2016 | 4.4 | $1,414,321 | $1,119,753 | $1,677,046 | $789,750 | $625,264 | $936,454 | $1,175,511 | $238,810 |
| 2017 | 4.4 | $1,456,840 | $1,153,346 | $1,727,358 | $767,445 | $607,568 | $909,951 | $1,210,865 | $245,975 |
| 2018 | 4.4 | $1,500,639 | $1,187,946 | $1,779,179 | $745,772 | $590,373 | $884,197 | $1,247,285 | $253,354 |
| 2019 | 4.4 | $1,545,759 | $1,223,585 | $1,832,554 | $724,712 | $573,664 | $859,173 | $1,284,804 | $260,955 |
| 2020 | 4.4 | $1,592,238 | $1,260,292 | $1,887,531 | $704,248 | $557,428 | $834,857 | $1,323,455 | $268,783 |
| 2021 | 4.4 | $1,640,118 | $1,298,101 | $1,944,156 | $684,364 | $541,652 | $811,229 | $1,363,271 | $276,847 |
| 2022 | 4.4 | $1,689,441 | $1,337,044 | $2,002,481 | $665,042 | $526,322 | $788,269 | $1,404,289 | $285,152 |
| 2023 | 4.4 | $1,740,251 | $1,377,155 | $2,062,556 | $646,267 | $511,426 | $765,960 | $1,446,544 | $293,707 |
| 2024 | 4.4 | $1,792,593 | $1,418,470 | $2,124,432 | $628,024 | $496,952 | $744,282 | $1,490,075 | $302,518 |
| 2025 | 4.4 | $1,846,513 | $1,461,024 | $2,188,165 | $610,297 | $482,887 | $723,217 | $1,534,920 | $311,593 |
| 2026 | 4.4 | $1,902,060 | $1,504,855 | $2,253,810 | $593,071 | $469,221 | $702,749 | $1,581,119 | $320,941 |
| 2027 | 4.4 | $1,959,283 | $1,550,000 | $2,321,424 | $576,334 | $455,941 | $682,860 | $1,628,713 | $330,570 |
| 2028 | 4.4 | $2,018,232 | $1,596,500 | $2,391,067 | $560,070 | $443,037 | $663,533 | $1,677,745 | $340,487 |
| 2029 | 4.4 | $2,078,960 | $1,644,395 | $2,462,799 | $544,266 | $430,498 | $644,754 | $1,728,258 | $350,701 |
| 2030 | 4.4 | $2,141,520 | $1,693,727 | $2,536,683 | $528,910 | $418,314 | $626,506 | $1,780,298 | $361,222 |
| | | | | **Present Worth of Annual Costs** | $15,014,542 | $11,883,696 | $17,798,125 | | |
| | | | | **Present Worth of Capital Project Cost** | $137,351,000 | $160,374,000 | $136,640,000 | | |
| | | | | **Total Present Worth** | **$152,365,542** | **$172,257,696** | **$154,438,125** | | |

### 7.3 Present Worth of Capital Project and Annual Costs

Present worth of the future year annual costs for the BWSC plan, the Louisville plan, and the KAW Pool 3 WTP plan were estimated following the same criteria used for capital project costs (6% investment rate). Table 13 shows, by year from 2010 to 2030, the future annual cost and the present worth (in 2006 dollars) for the KAW Pool 3 WTP, the BWSC regional system, and the Louisville Water Company pipeline water supply alternatives. The cumulative amount of the present worth of the annual costs added to the present worth of the capital project cost yields the total present worth for each alternative, as summarized in Table 14.

The BWSC alternative total present worth was based on KAW being responsible for 22/31 of the capital project cost for the BWSC project and 22/31 of the annual operation and maintenance costs. As shown in Table 14, the total present worth of the KAW cost of the BWSC alternative is $172,258,000.

The Louisville pipeline alternative has a total present worth of $154,438,000, as shown in Table 14. This estimate is based on the previously-identified capital project cost, which includes a 20% construction cost contingency and 25% of construction cost for permitting, engineering, legal, and administrative fees. It was assumed the bulk rate (based on 1997 data) and the KAW pumping cost will increase by 3% per year from 2010 to 2030. This alternative was previously planned to serve only KAW. Costs would increase if facilities would be sized to provide more than about 23 mgd. For example, 36-inch pipe was included in the planning-level estimate. To provide up to 30 mgd (comparable with the KAW and the BWSC alternatives), 42-inch pipe would be required, which would increase the transmission main construction cost by $16,400,000 (328,000 feet times $50 per foot). The present worth of a Louisville pipeline project using 42-inch pipe would also increase substantially.

The KAW Pool 3 water supply alternative utilizing RWPS #4/WTP #5 (Peaks Mill) has a total present worth of $152,366,000, as shown in Table 14. Total present worth for the six (6) KAW Pool 3 project alternatives ranged from $152,366,000 to $164,279,000. Present worth costs for the KAW Pool 3 WTP project alternatives include a 20% contingency for construction costs; 25% of construction cost for permitting, engineering, legal, and administrative fees; and annual operation and maintenance costs inflated by 3% per year from 2010 to 2030.

### Table 14

### Present Worth of Capital Project and Annual Costs for KAW Water Supply Alternatives

| Project | Capital Project Cost Present Worth(1) | Annual Cost Present Worth(2) | Total Present Worth |
|---|---|---|---|
| | | | |
| RWPS#1/WTP#1 (Stamping Ground-Road) | $149,264,000 | $15,015,000 | $164,279,000 |
| | | | |
| RWPS#1/WTP#1 (Stamping Ground-ROW) | $146,619,000 | $15,015,000 | $161,634,000 |
| | | | |
| RWPS#3/WTP#4 (Stamping Ground-Road) | $147,716,000 | $15,015,000 | $162,731,000 |
| | | | |
| RWPS#3/WTP#4 (Peaks Mill) | $145,406,000 | $15,015,000 | $160,421,000 |
| | | | |
| RWPS#4/WTP#5 (Peaks Mill) | $137,351,000 | $15,015,000 | $152,366,000 |
| | | | |
| RWPS#5/WTP#6 (Peaks Mill) | $137,531,000 | $15,015,000 | $152,546,000 |
| | | | |
| BWSC | $160,374,000 | $11,884,000 | $172,258,000 |
| | | | |
| Louisville | $136,640,000 | $17,798,000 | $154,438,000 |

(1) From Table 12, except for BWSC and Louisville. Based on an inflation rate of 3% and an investment rate of 6%. Present worth value assumes project construction in 2008.
(2) From Table 13 for period from 2010 to 2030.

## 8.0 SUMMARY

1. Existing reports and other documents detail the history of KAW efforts to secure additional water supply.
2. In 1992, KAW selected a project to deliver treated Ohio River water from the Louisville Water Company from over 50 alternatives as the least cost option.
3. In 1998, KAW stopped work on the selected project due to public opposition and agreed to cooperate with other entities in reviewing water supply alternatives.
4. The Bluegrass Water Supply Consortium (Consortium) was formed in 1999 to identify and implement a regional solution to the area's water supply deficiencies, with the Kentucky River being the primary source of supply. From this group, in November 2004, the Bluegrass Water Supply Commission (BWSC) was formed, with KAW as a partner rather than a member of the BWSC.
5. In 2004, a report prepared by O'Brien & Gere for the Bluegrass Area Development District, in association with the Consortium, detailed a regional water supply plan, including an intake in Pool 3, a 45 mgd water treatment plant, and a grid network of transmission mains to deliver water to BWSC members. Because the Kentucky River reportedly has insufficient yield under drought conditions, a supplemental supply of raw water would be made available from the Ohio River.
6. Since the formation of the BWSC, the number of members has decreased, which has reduced the planned water treatment plant capacity to 31 mgd.
7. Dam 10 improvements, which were to increase the Kentucky River yield by 10 mgd, have not been completed, and the completion schedule is uncertain. Raising of the Dam 10 crest has met with opposition from environmental and other entities.
8. The "water credit" program considered in the BWSC regional plan reportedly will not be implemented by KDOW.
9. KAW is under Order by the Kentucky PSC to address identified source of supply deficiencies.

10. The BWSC regional alternative may not be the least cost alternative available to KAW. Agreement terms for the "take or pay" contract between BWSC and KAW have not been finalized.
11. Progress on the BWSC regional plan has been very limited.
12. Phase I of the BWSC regional plan, which would provide a transmission main between Frankfort and KAW, to supply KAW with up to 5 mgd of Frankfort water, has not been designed, and the completion schedule of Phase I is uncertain.
13. KAW demand projections were reevaluated in 2006. Based on the 2006 projection, the 2020 maximum day demand for a hot, dry scenario is 80.90 mgd. Drought average day demand projected for 2020 is 59 mgd.
14. The highest maximum day demand on record is 71.82 mgd in 2002.
15. Permit No. 200, revised September 17, 1999, allows KAW to withdraw up to 60 mgd in the months of November through April from the Kentucky River and up to 63 mgd in the months of May through October. During low-flow periods and drought conditions, allowable withdrawals can be reduced to as low as 30 mgd. Temporary Permit modifications have been requested on an annual basis by KAW to increase the minimum allowable withdrawal to 35 mgd, with the incremental reductions based on Kentucky River flow at Lock 10 and water levels in the pools.
16. The combined water treatment capacity is 65 mgd, with the rated capacity of the KRS at 40 mgd and the rated capacity of the RRS at 25 mgd. KAW has demonstrated the ability to produce 50 mgd at the KRS and 30 mgd at the RRS while maintaining good water quality. However, these rates are not considered reliable during all weather conditions. To meet the production goal of 80 mgd, additional treatment capacity would be required.
17. Several alternatives were identified and evaluated as part of this study to address existing KAW supply and treatment capacity deficiencies.
18. The original BWSC plan called for a 45 mgd water treatment plant at Pool 3 of the Kentucky River and a grid network to deliver water to BWSC member utilities and KAW. Because of a potential Kentucky River supply deficiency, a

supplemental intake, pumping station, and raw water transmission main from the Ohio River was also included.

19. With the reduction in the number of BWSC members, the BWSC plan has been modified. The current planned capacity of the BWSC water treatment plant is 31 mgd. The Ohio River supplemental supply has been reduced, but not eliminated from the BWSC plan. Dam 10 improvements have not been completed, which were projected to increase the Kentucky River safe yield by 10 mgd.

20. KAW has made a non-binding commitment to the BWSC for 22 mgd, which is a significant portion of the current planned capacity of 31 mgd at the BWSC water treatment plant.

21. Costs associated with the BWSC plan were evaluated for this study. The total project cost of the original (45 mgd) BWSC regional plan was $265 million, as documented in the 2004 O'Brien & Gere report. Utilizing August 2005 costs and American Water experience for transmission and distribution piping, the opinion of probable cost is estimated by Gannett Fleming to be $410 million.

22. For a revised (31 mgd) BWSC plan, the total project cost was $239 million, as documented in a November 2005 O'Brien & Gere letter report. Utilizing August 2005 costs and American Water experience for transmission and distribution piping, the opinion of probable cost for this project is estimated by Gannett Fleming to be $280 million.

23. Smaller transmission/distribution mains proposed in the BWSC plan to serve individual systems beyond the KAW system will not benefit KAW customers. If the estimated costs of these mains are not included, the estimated project cost for the BWSC plan is reduced to $201 million, based on costs and information in the November 2005 O'Brien & Gere letter report.

24. Phase I of the BWSC plan would be a connection between the Frankfort and KAW systems, which would become a primary component of the grid network. The estimated cost of the Phase I improvements is about $38 million, based on costs in the November 2005 O'Brien & Gere letter report.

25. The Louisville pipeline project was identified by KAW more than 10 years ago to provide additional water supply to the KAW system. An updated cost estimate of the Louisville pipeline project was made for this study. Using previous quantities of materials and facility capacities, the estimate for the Louisville pipeline project was about $141 million, in 2005 dollars.

26. Increasing the capacity of the KAW pumping, transmission, and treatment facilities to meet the projected 2020 maximum day demand of 80 mgd was investigated for this study. Although these improvements would not increase the "safe yield" of the Kentucky River, they would enable KAW to self-supply up to 80 mgd when water is available in the Kentucky River, provided that the KDOW would increase the withdrawal Permit.

27. In order to provide for a reliable self supply system capable of meeting 80 mgd system demands when adequate supply is available in Pool 9 of the Kentucky River, KAW system improvements would be needed.

28. Total estimated project cost for identified improvements to the existing KAW facilities to provide 80 mgd reliable capacity when adequate supply is available in Pool 9 of the Kentucky River was about $80 million. Because the permitted withdrawal from the Kentucky River can be reduced to 30 mgd during extreme droughts, it is not economically feasible to invest $80 million in improvements in existing facilities to provide 80 mgd capacity.

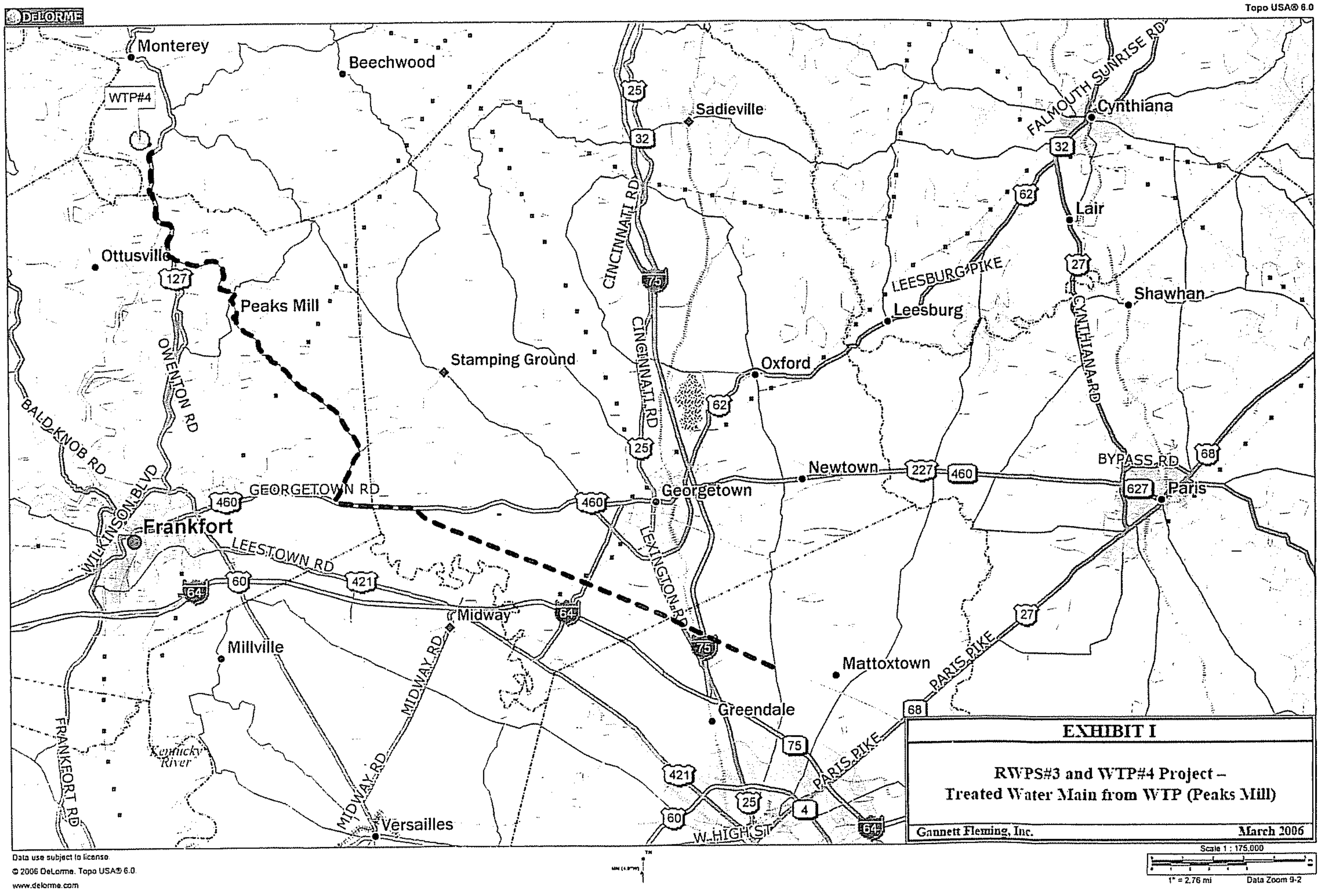
29. In 2006 KAW implemented a $5 million rehabilitation program that would also improve reliability to utilize Kentucky River water when it is available.

30. Another water supply alternative involved construction by KAW of an intake in Pool 3 of the Kentucky River, a treatment plant, and high service pumping and transmission facilities to connect to the existing KAW Central Division distribution system.

31. The KAW WTP would have a 20 mgd capacity, expandable to 30 mgd. Preliminary design criteria were developed for the project and are included in Appendices B and C of this report. No supplemental supply from the Ohio River is included.

32. Based on U.S. Geological Survey data collected at Lock 2, since 1960 the minimum flow at Lock 2 was about 80 mgd (drought of 1999). During the drought of 1930, the minimum flow at Lock 2 was about 13 mgd.
33. Estimated project cost for a KAW Pool 3 water supply project is $145 million, in 2006 dollars. This project includes an intake and raw water pumping station at Pool 3, a water treatment plant (20 mgd, expandable to 30 mgd), raw and treated water transmission main, and a booster pumping station and storage tank.
34. Based on a comparison of the estimated KAW costs for the alternatives investigated in this study, the total present worth (2006) of the KAW Pool 3 WTP project is approximately $152 million, the total present worth of the Louisville pipeline project is approximately $154 million, and the total present worth of the BWSC plan is approximately $172 million, as shown in Table 13 of this report.
35. KAW supports a regional solution to the water supply problem, actively participating and providing resources to the BWSC. Under regulatory and customer pressure, KAW committed to present its plan to the PSC by Spring 2007, announcing it would build a treatment plant and transmission line for adequate water supply by 2010. KAW is continuing to work with the BWSC on a partnership for the new facilities.

# *Exhibits*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CINCINNATI RD
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GEORGETOWN RD
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Newtown
BYPASS RD
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Millville
MIDWAY RD
Mattoxtown
PARIS PIKE
Greendale
FRANKFORT RD
Kentucky River
Versailles
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EXHIBIT I
RWPS#3 and WTP#4 Project –
Treated Water Main from WTP (Peaks Mill)
Gannett Fleming, Inc.
March 2006
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Scale 1 : 175,000
1" = 2.76 mi
Data Zoom 9-2

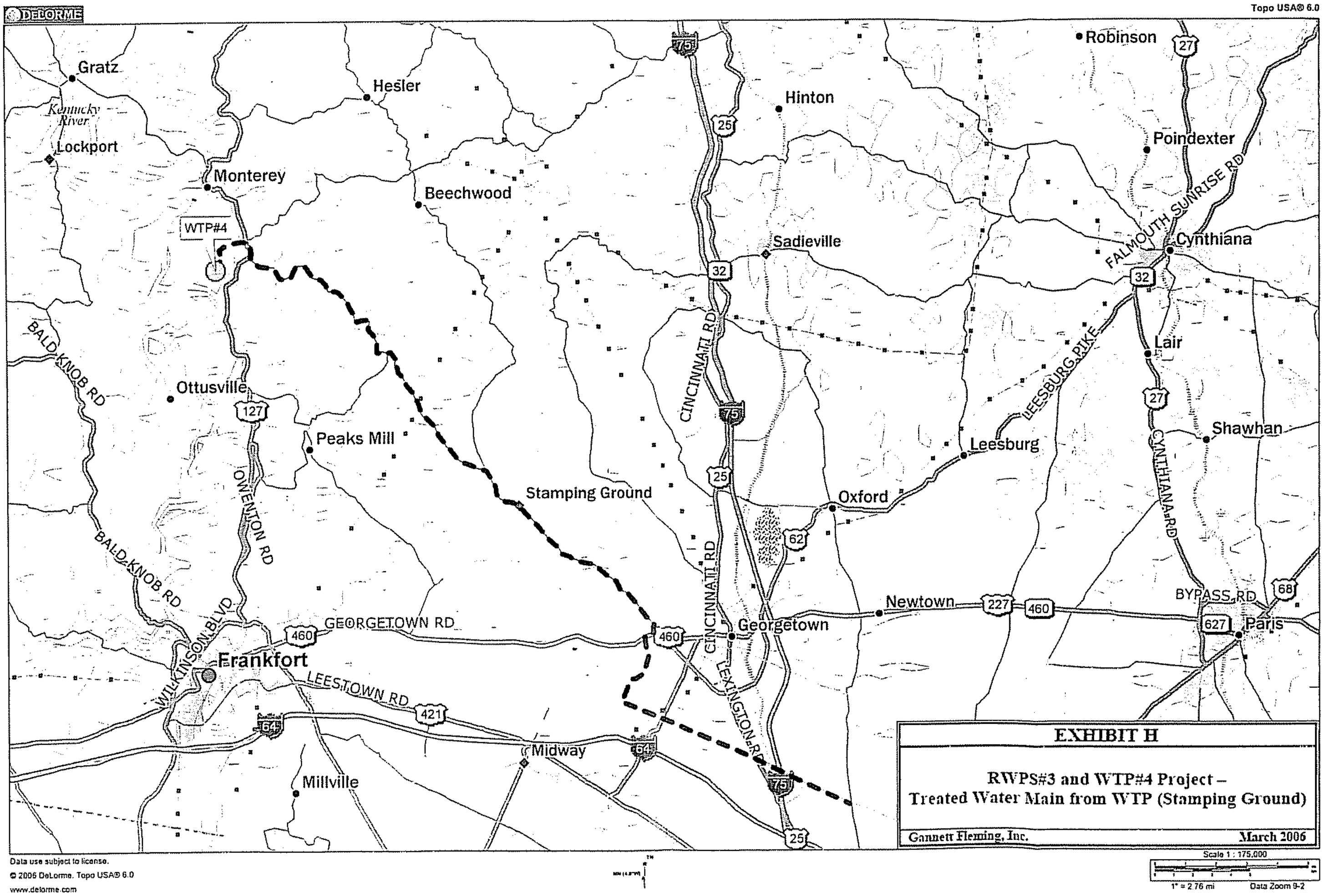



**EXHIBIT H**

**RWPS#3 and WTP#4 Project –
Treated Water Main from WTP (Stamping Ground)**

Gannett Fleming, Inc. March 2006

DeLORME Topo USA® 6.0

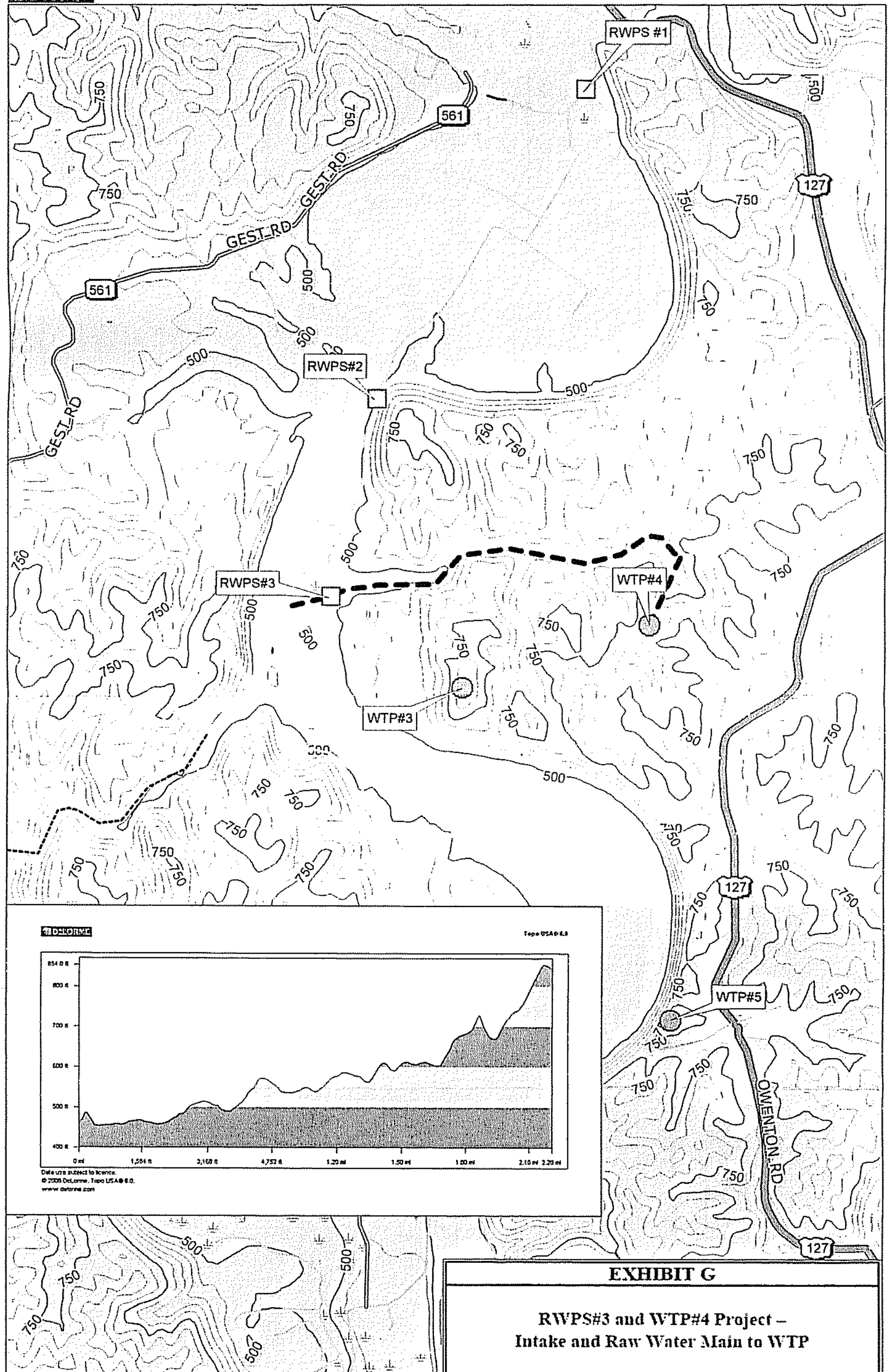



**EXHIBIT G**

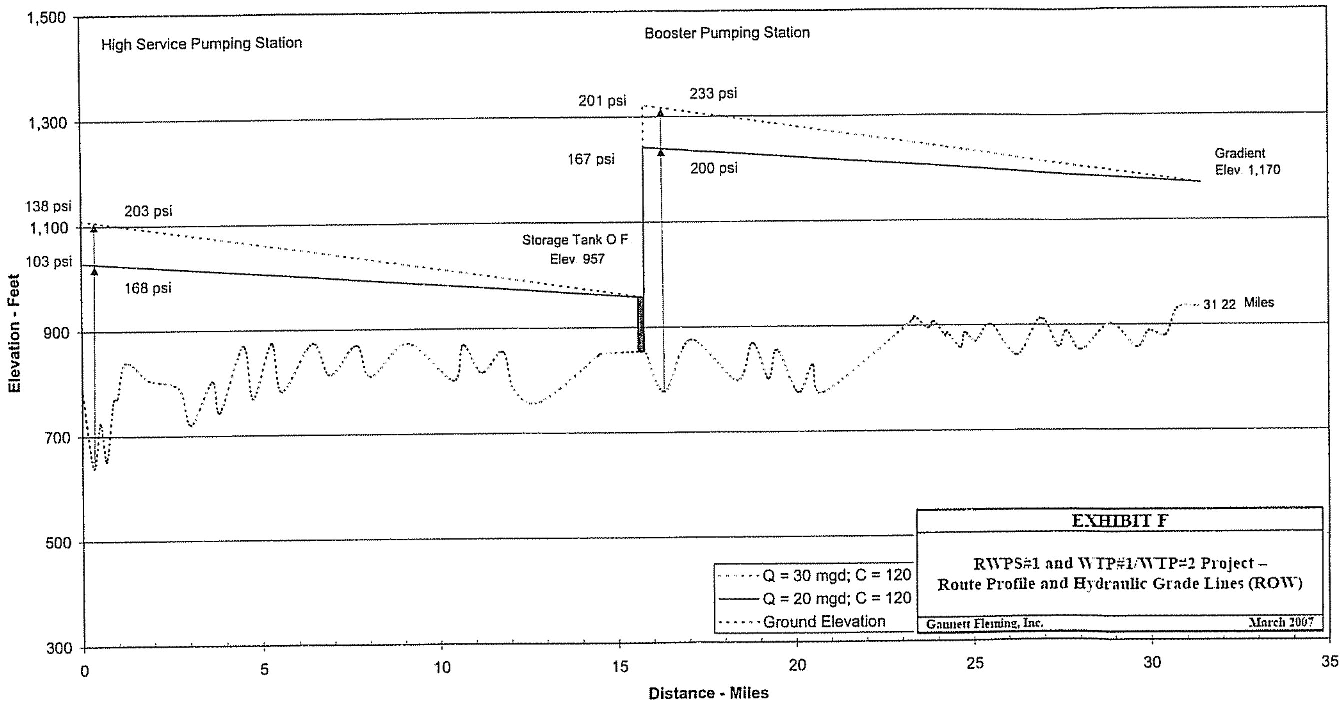
**RWPS#3 and WTP#4 Project – Intake and Raw Water Main to WTP**

Gannett Fleming, Inc. March 2006

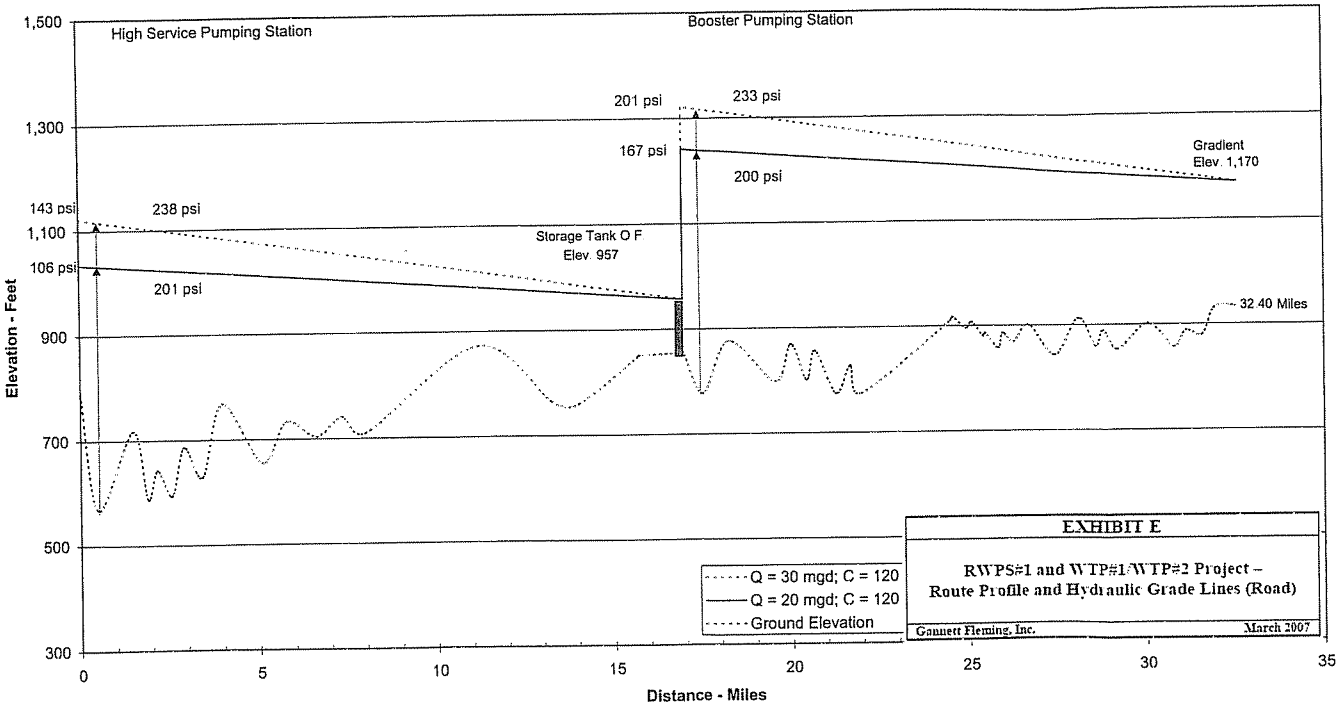


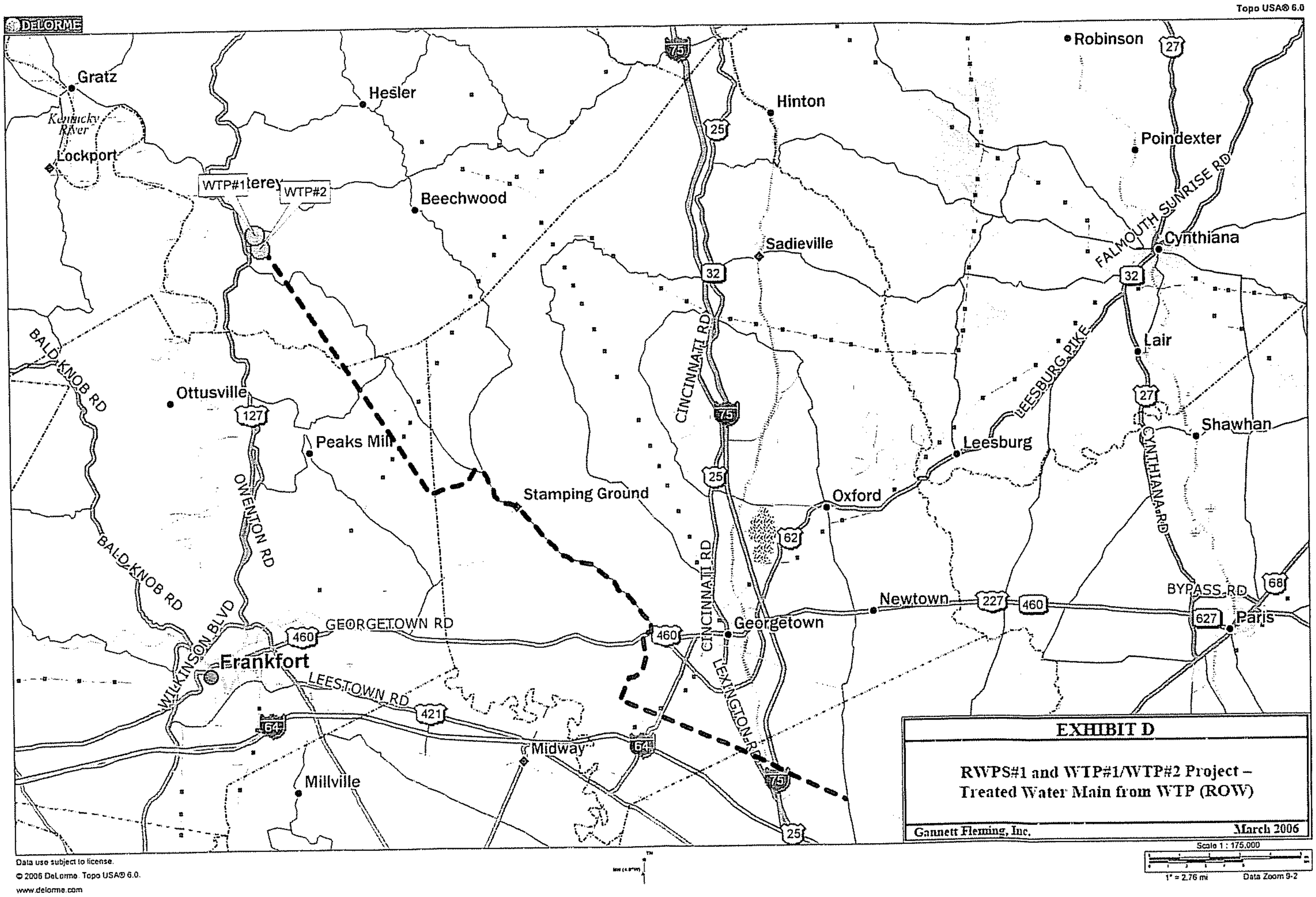
Scale 1 : 25,000
1" = 2,083.3 ft Data Zoom 12-0

**KAW Treated Water Main Route WTP #1/2 Powerline**
**Hydraulic Grade Lines**
**42 Inch Main**



## KAW Treated Water Main Route WTP #1/2 Road
## Hydraulic Grade Lines
## 42 Inch Main

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Cynthiana
FALMOUTH SUNRISE RD
Sadieville
BALD KNOB RD
Ottusville
Peaks Mill
Stamping Ground
OWENTON RD
CINCINNATI RD
LEESBURG PIKE
Lair
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BYPASS RD
Paris
Georgetown
GEORGETOWN RD
WILKINSON BLVD
Frankfort
LEESTOWN RD
LEXINGTON RD
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Millville
EXHIBIT D
RWPS#1 and WTP#1/WTP#2 Project – Treated Water Main from WTP (ROW)
Gannett Fleming, Inc.
March 2006
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1" = 2.76 mi
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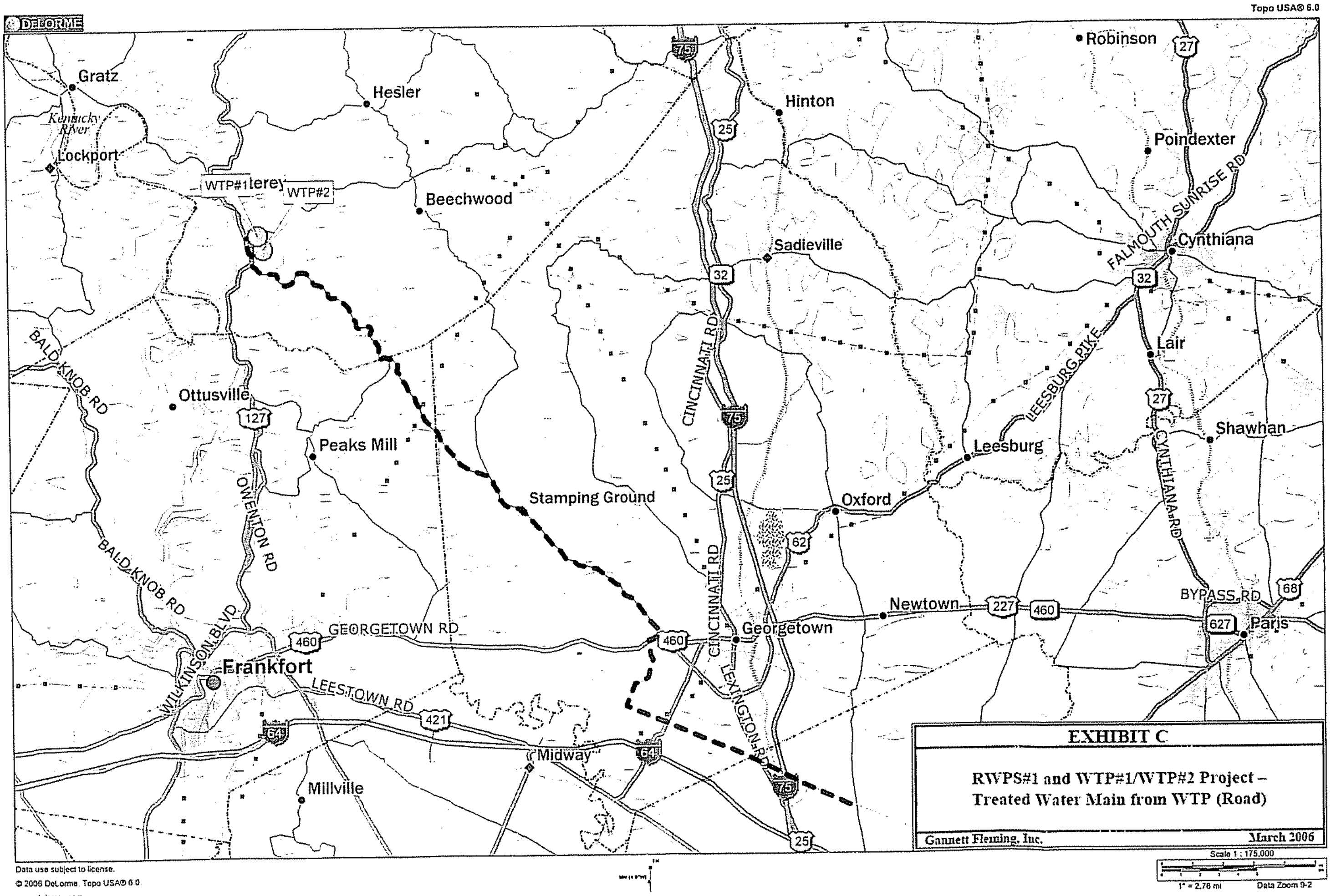
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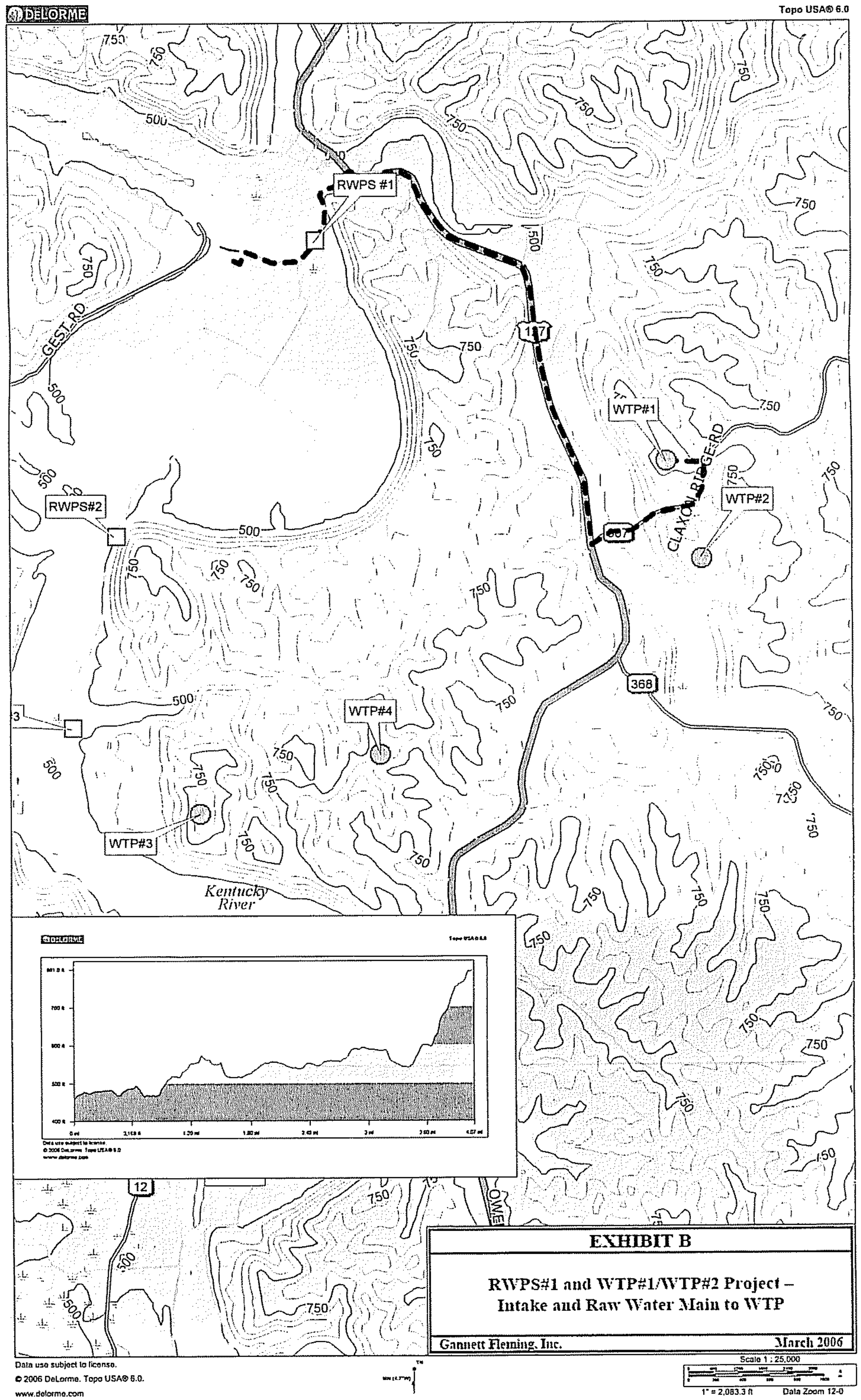
Sadieville
Cynthiana
FALMOUTH SUNRISE RD
Lair
Shawhan
Leesburg
LEESBURG PIKE
CYNTHIANA RD
CINCINNATI RD
BALD KNOB RD
Ottusville
Peaks Mill
OWENTON RD
Stamping Ground
Oxford
Newtown
BYPASS RD
Paris
Georgetown
GEORGETOWN RD
WILKINSON BLVD
Frankfort
LEESTOWN RD
LEXINGTON RD
Midway
Millville
EXHIBIT C
RWPS#1 and WTP#1/WTP#2 Project – Treated Water Main from WTP (Road)
Gannett Fleming, Inc.
March 2006
Scale 1 : 175,000
1" = 2.76 mi
Data Zoom 9-2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WTP#1
WTP#2
WTP#3
WTP#4
GEST RD
CLAXON RIDGE RD
Kentucky River
127
368
12
EXHIBIT B
RWPS#1 and WTP#1/WTP#2 Project –
Intake and Raw Water Main to WTP
Gannett Fleming, Inc.
March 2006
Scale 1 : 25,000
1" = 2,083.3 ft
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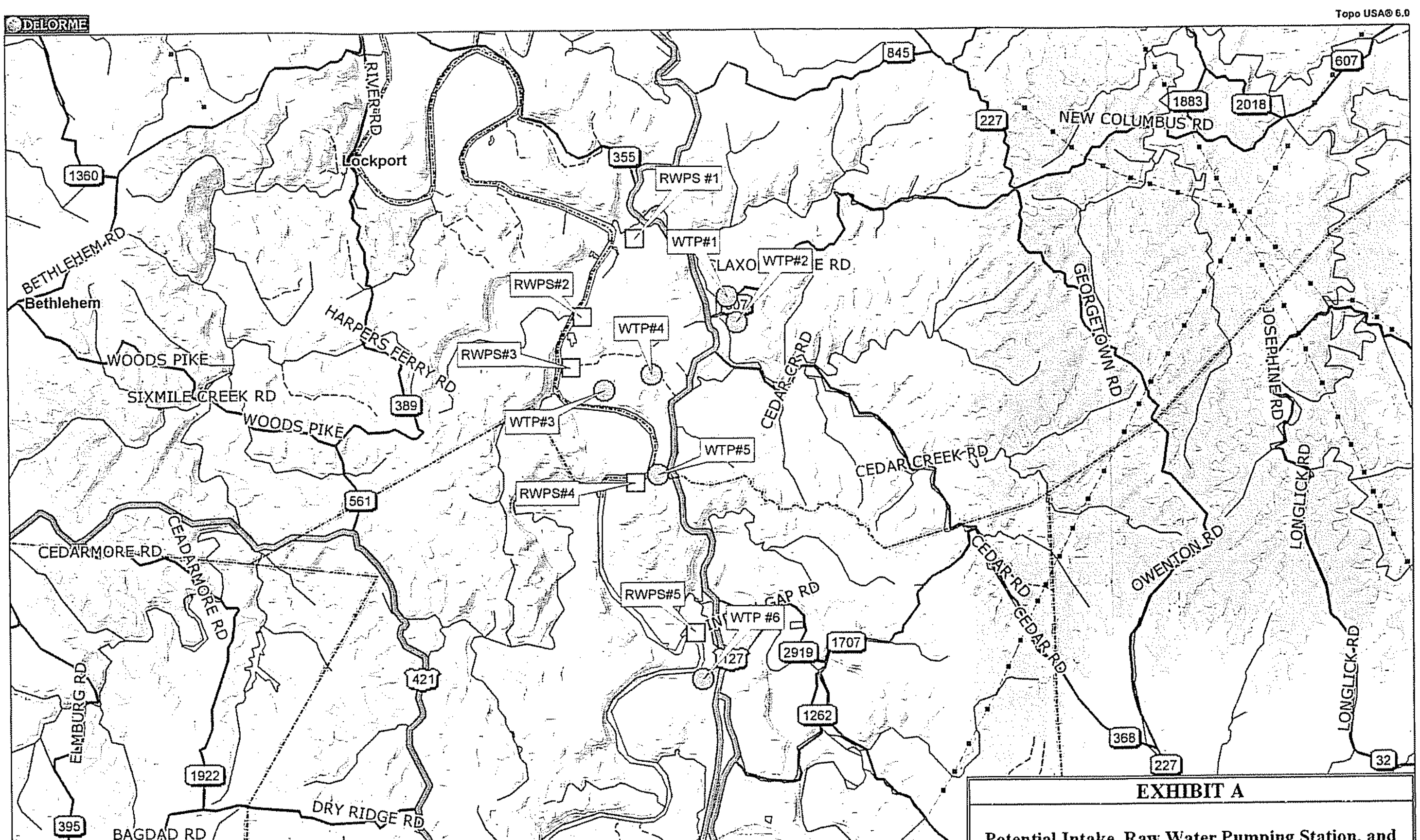
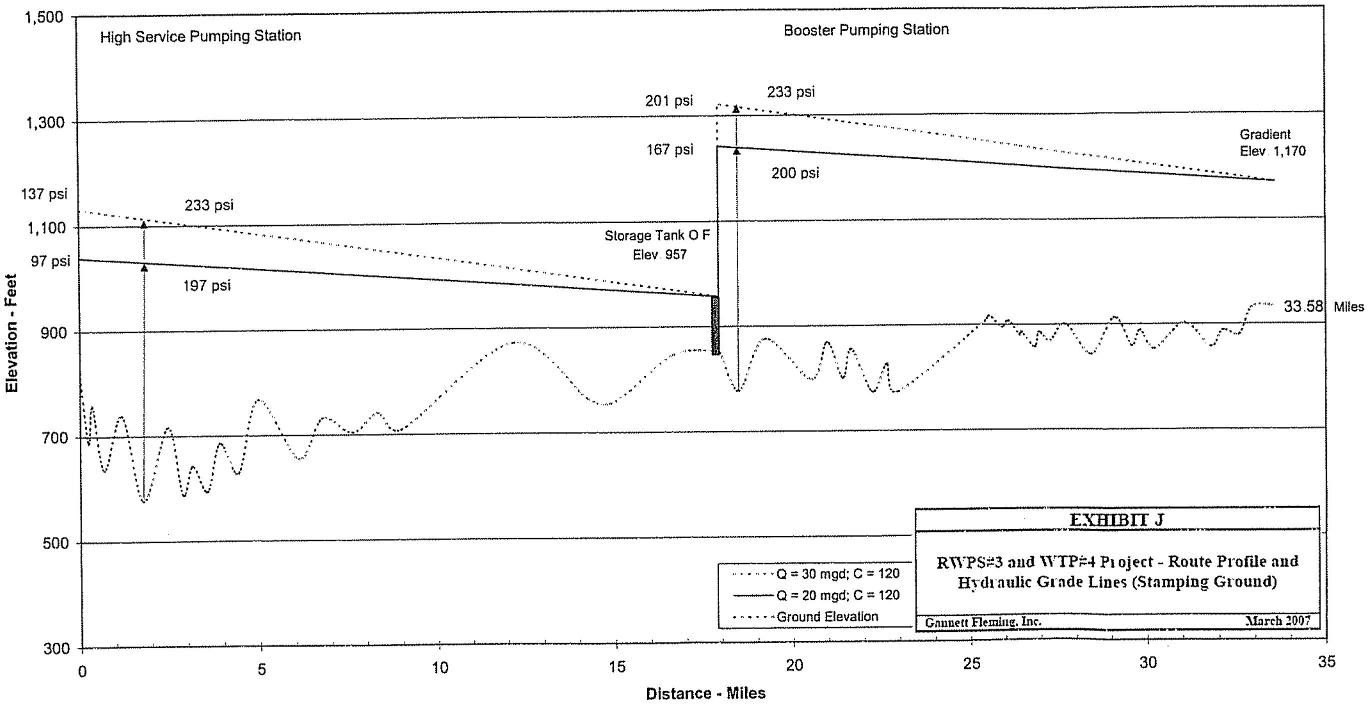



# EXHIBIT A

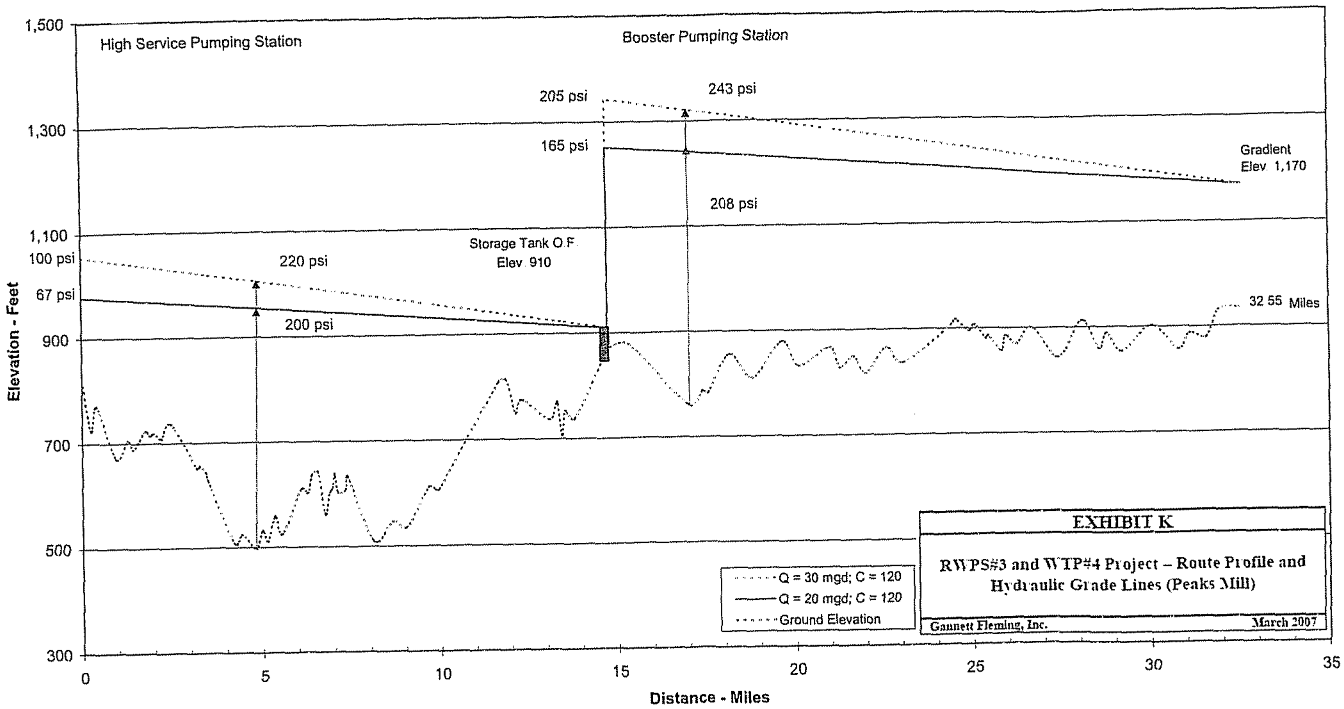
**Potential Intake, Raw Water Pumping Station, and Water Treatment Plant Sites**

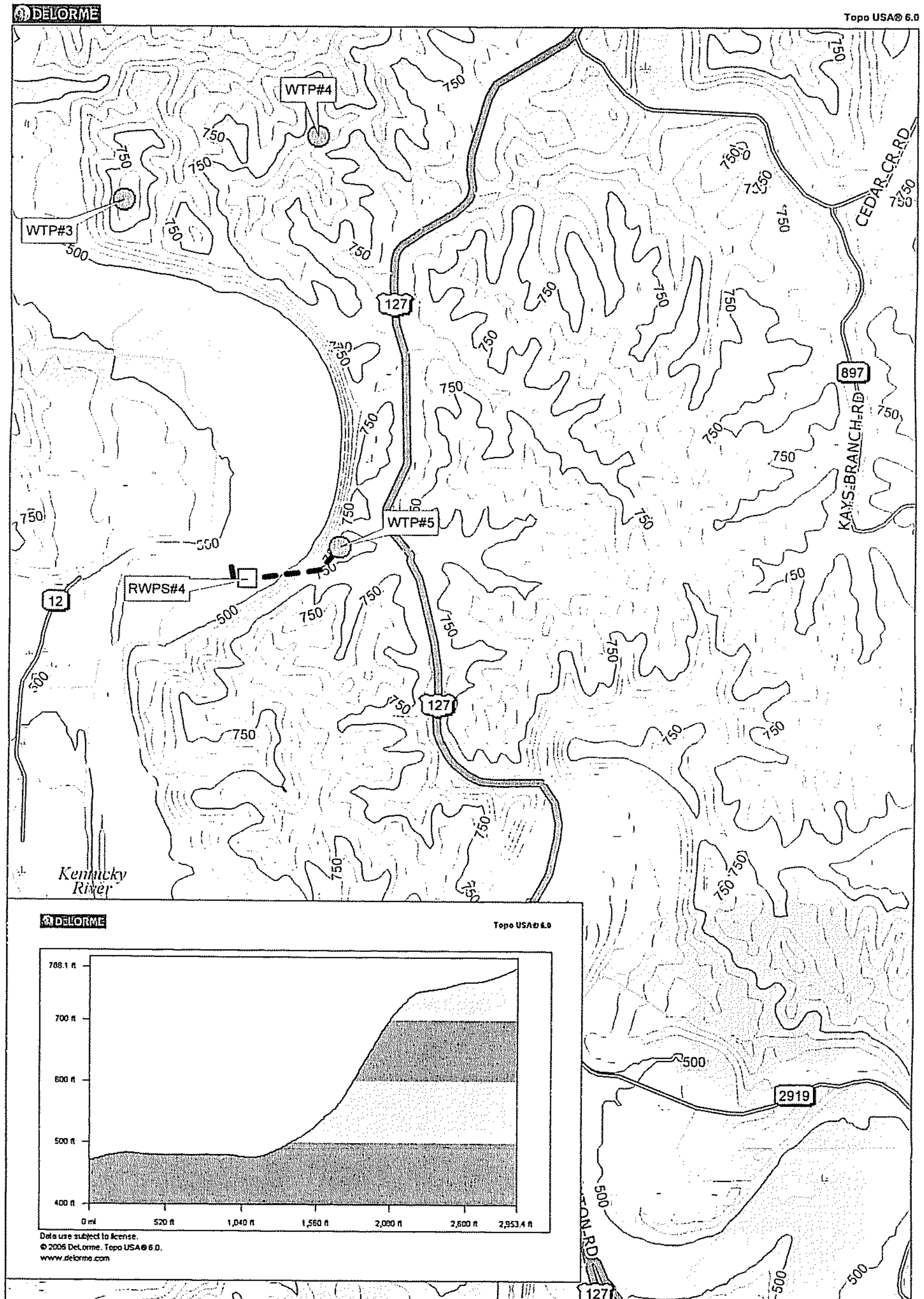
Gannett Fleming, Inc. March 2006

## KAW Treated Water Main Route WTP #4 (Stamping Ground Route)
## Hydraulic Grade Lines
## 42 Inch Main



## KAW Treated Water Main Route WTP #4 (Peaks Mill Route)
## Hydraulic Grade Lines
## 42 Inch Main






# EXHIBIT L

**RWPS#4 and WTP#5 Project –**
**Intake and Raw Water Main to WTP**

Gannett Fleming, Inc. March 2006

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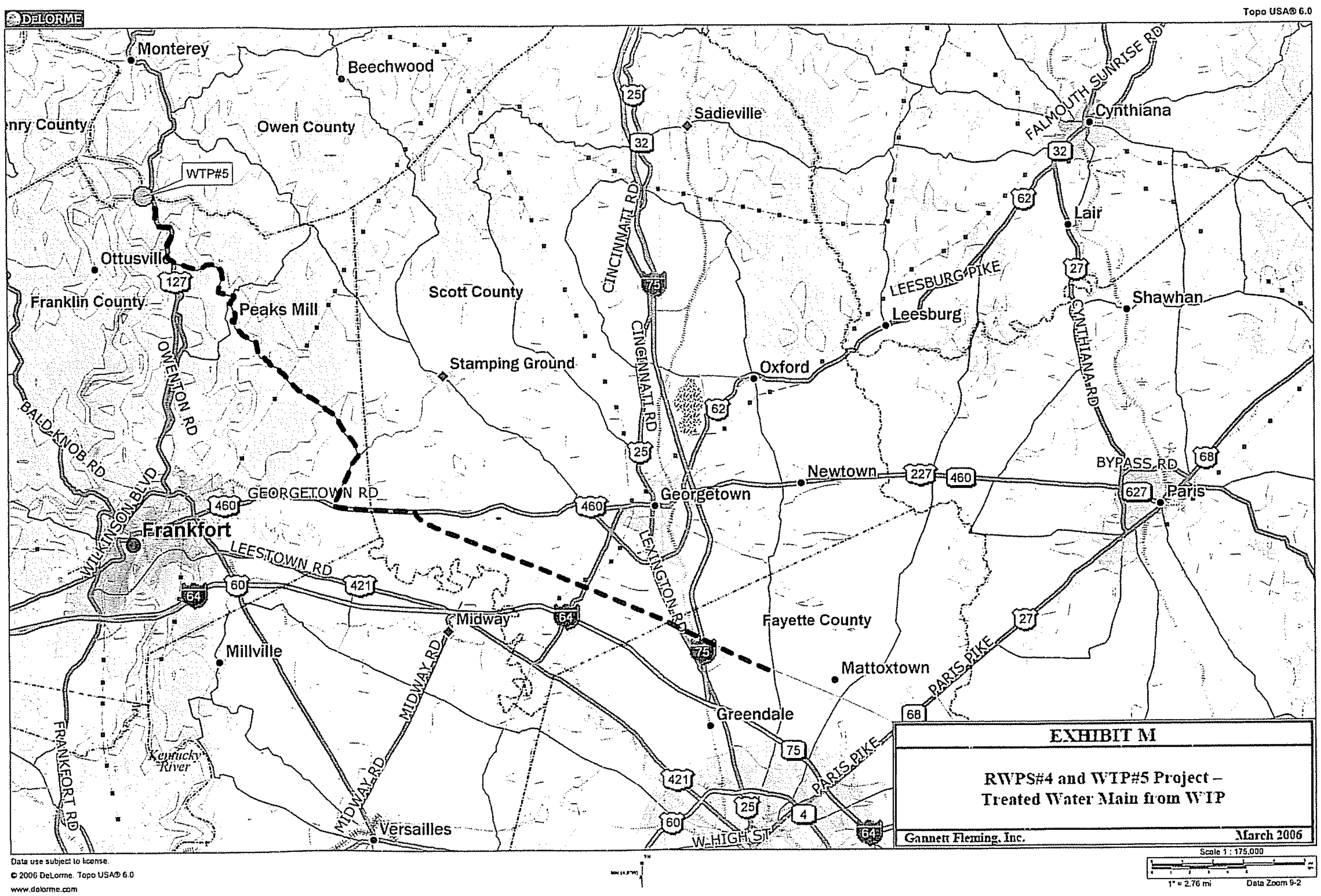
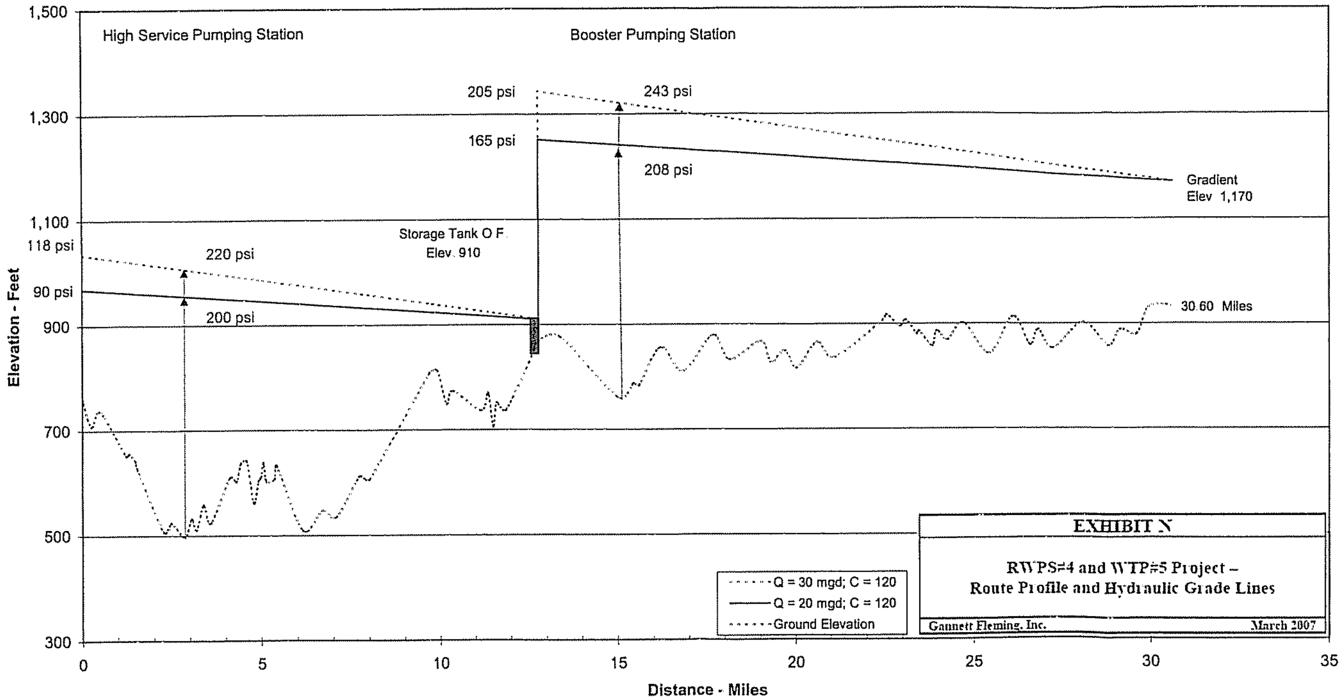


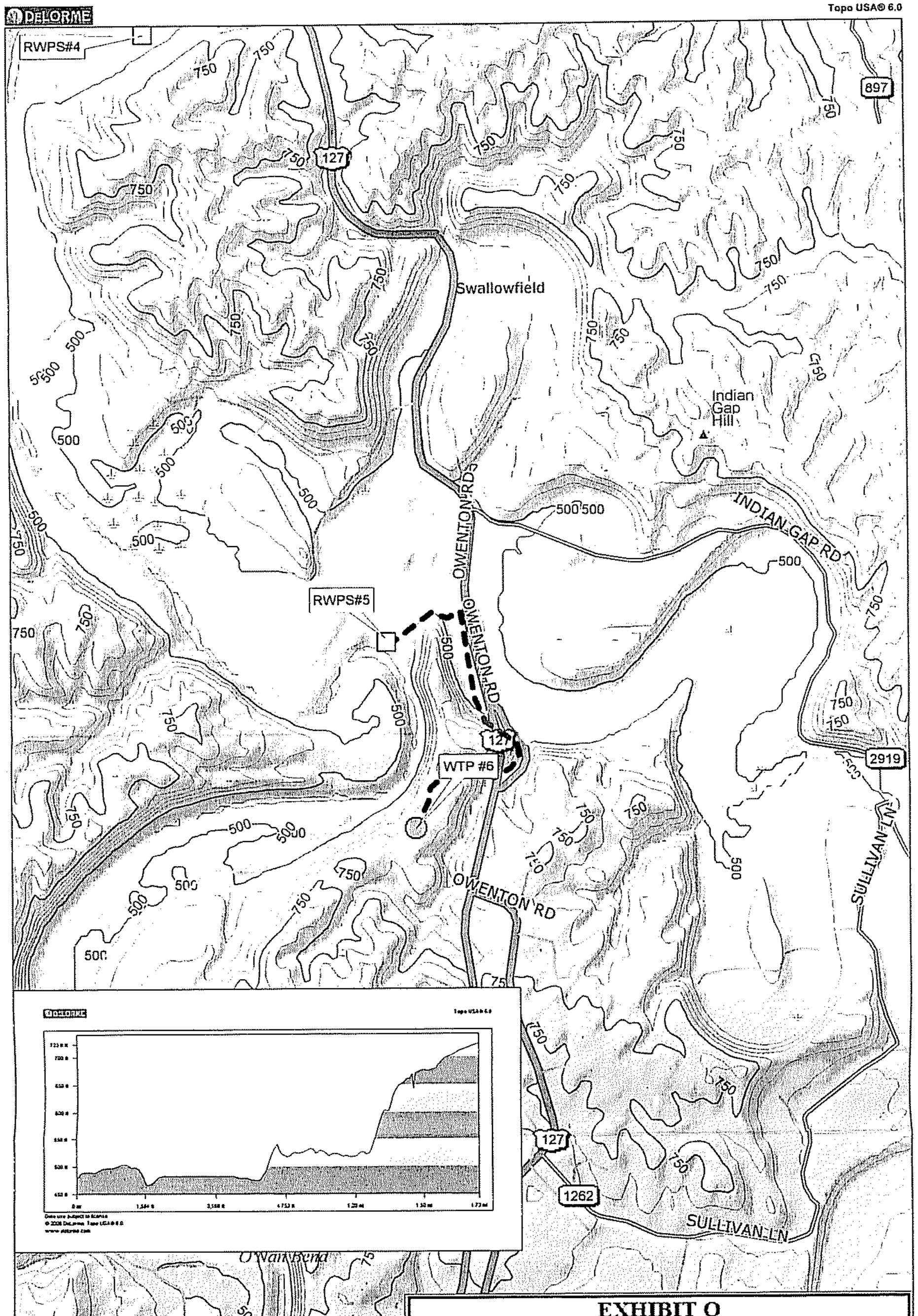

**EXHIBIT M**

**RWPS#4 and WTP#5 Project – Treated Water Main from WTP**

Gannett Fleming, Inc. March 2006

## KAW Treated Water Main Route WTP #5 (Peaks Mill Route)
## Hydraulic Grade Lines
## 42 Inch Main



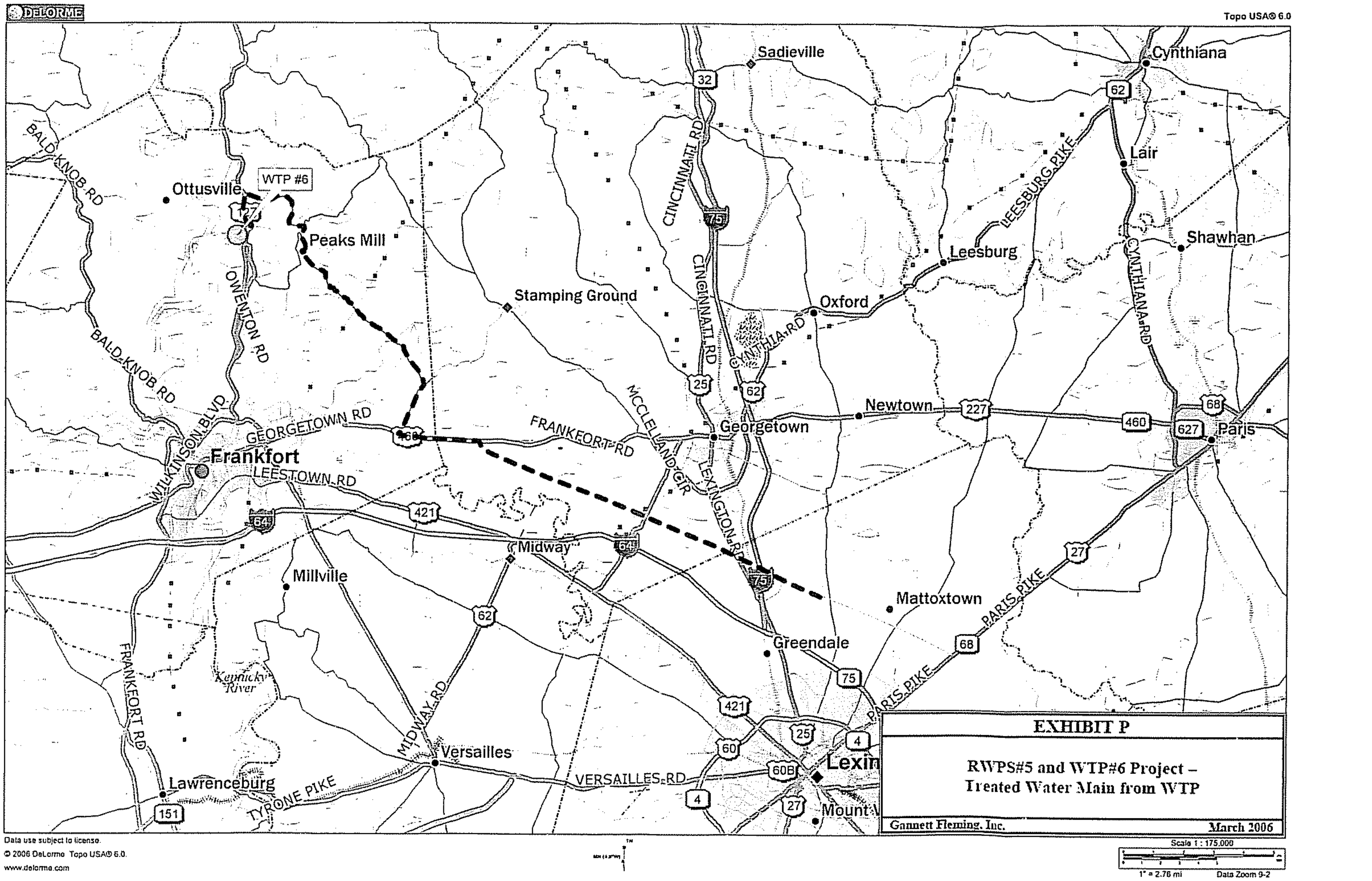



# EXHIBIT O

**RWPS#5 and WTP#6 Project –**
**Intake and Raw Water Main to WTP**

**Gannett Fleming, Inc.** **March 2006**

Scale 1 : 25,000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WTP #6
Peaks Mill
Stamping Ground
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CYNTHIA RD
OWENTON RD
BALD KNOB RD
Newtown
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Paris
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FRANKFORT RD
MCCLELLAND CIR
LEXINGTON RD
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LEESTOWN RD
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Millville
Mattoxtown
Greendale
PARIS PIKE
FRANKFORT RD
Kentucky River
MIDWAY RD
Versailles
VERSAILLES RD
Lawrenceburg
TYRONE PIKE
Lexin
Mount V
EXHIBIT P
RWPS#5 and WTP#6 Project –
Treated Water Main from WTP
Gannett Fleming, Inc.
March 2006
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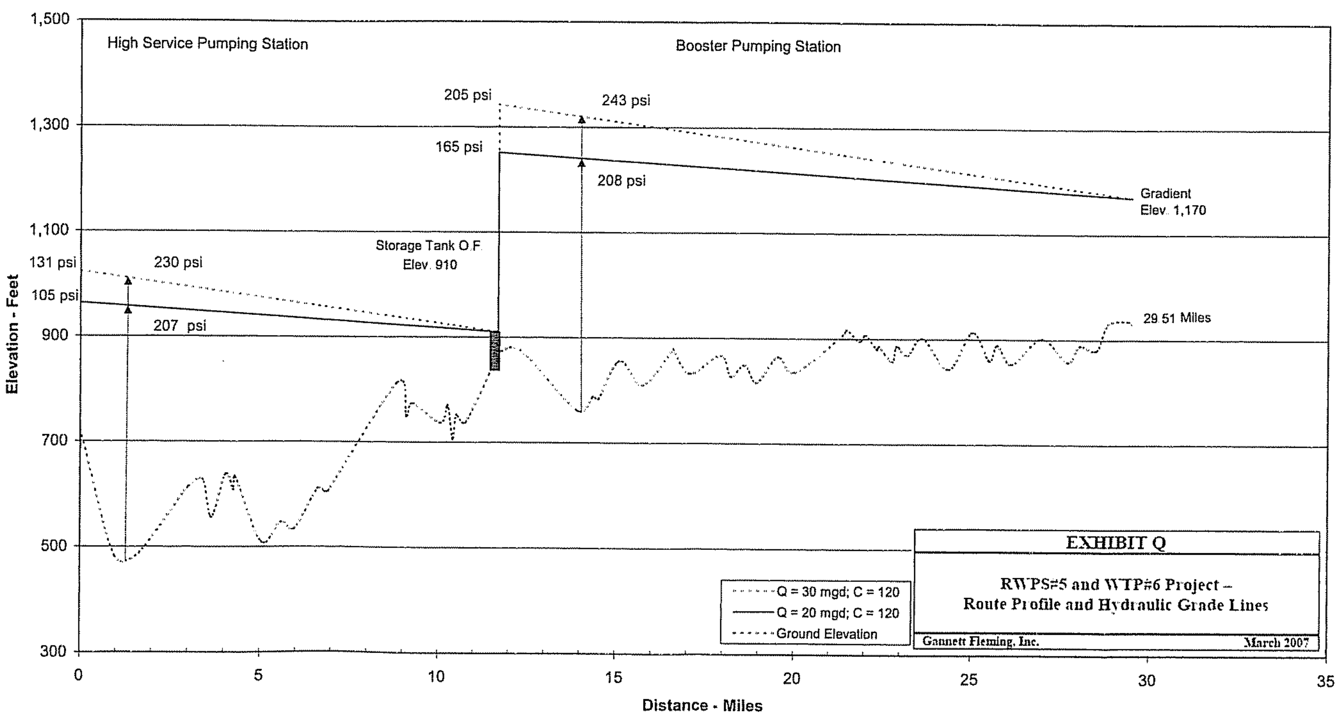
1" = 2.76 mi
Data Zoom 9-2

## KAW Treated Water Main Route WTP #6 (Peaks Mill Route)
## Hydraulic Grade Lines
## 42 Inch Main



# *Appendices*

*Appendix A*

## Estimation of Safe Yield
## Lock 2 on the Kentucky River

# Kentucky American Water
# Estimation of Safe Yield
# Lock 2 on the Kentucky River

## General

In order for the potential KAW water supply option using Pool 3 of the Kentucky River as the source to be feasible, sufficient yield must be available. The Pool 3 WTP concept includes building a water supply intake at the pool created by Lock and Dam 3 on the Kentucky River and treating the water at a new water treatment plant. From the WTP, the treated water would be pumped to the existing KAW Central Division distribution system, which includes Lexington-Fayette County and parts of six (6) surrounding counties. Additional supply to be taken from this source could be as much as 30 mgd in the future.

The water available from the Kentucky River at Pool 3 is mainly from natural riverflow; however, stored water impounded by upstream locks and dams can be released to augment extremely low river flows. A map showing water systems with surface water intakes in the Kentucky River basin is presented in Figure 1. A plot of the Kentucky River profile showing the location of the locks and water supply river intakes is presented in Figure 2.

Low-level release valves were installed at Lock Nos. 10, 11, 12, 13, and 14 sometime after 1996. Water can be released from the upstream reservoirs using these low-level release valves at each lock.

## Available USGS Stream Gaging Station Data for the Kentucky River

The USGS established gaging stations on the Kentucky River at Lock Nos. 2, 4, 6, 7, 8, and 10, and has continuously estimated average daily flows at these locks beginning as early as 1907. In general, measurements of discharge above 1,000 cfs are rated as "good" and below 1,000 cfs as "fair". USGS stream gaging data available at these locks are summarized in Table 1.

**Table 1**

**Summary of USGS Gaging Station Data on the Kentucky River Between Lock No. 2 and Lock No. 10**

| USGS Index Number | Station Name | Drainage Area (Miles$^2$) | Period of Record | Years of Record | Minimum Daily Flow Since 1961 (cfs) *(Year)* |
|---|---|---|---|---|---|
| 03290500 | Kentucky River at Lock 2, at Lockport | 6,180 | 1925-Present | 78 | 112 *(1999)* |
| 03287500 | Kentucky River at Lock 4, at Frankfort | 5,411 | 1925-Present | 79 | 78 *(2002)* |
| 03287000 | Kentucky River at Lock 6, near Salvisa | 5,102 | 1925-Present | 80 | 83 *(1984)* |
| 03286500 | Kentucky River at Lock 7, near High Bridge | 5,036 | 1992-Present | 13 | 79 *(2002)* |
| 03284500 | Kentucky River at Lock 8, near Camp Nelson | 4,414 | 1939-1971 & 2002-Present | 34 | 35 *(1953)* |
| 03284000 | Kentucky River at Lock 10, near Winchester | 3,955 | 1907-Present | 98 | 22 *(1999)* |

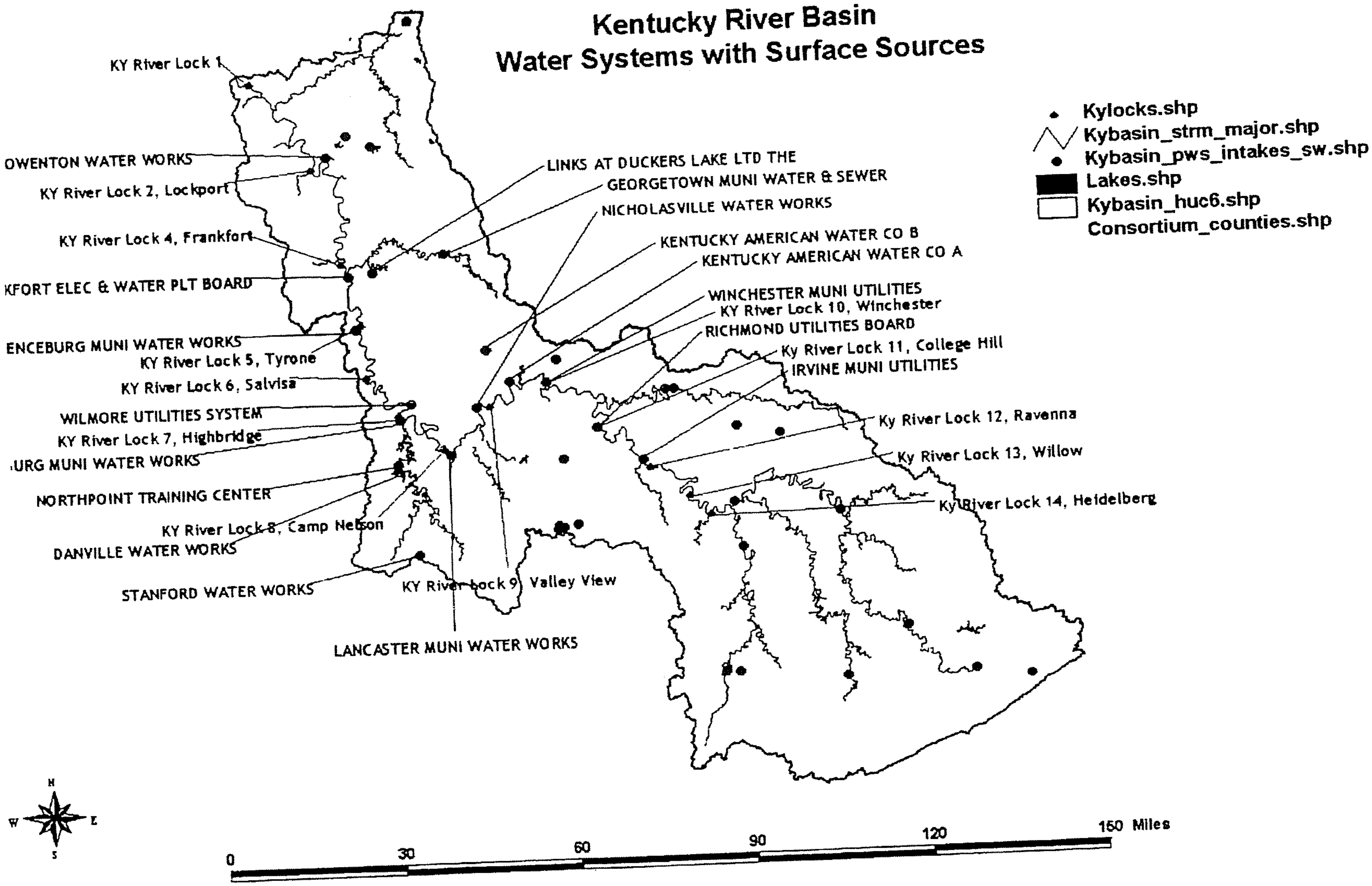
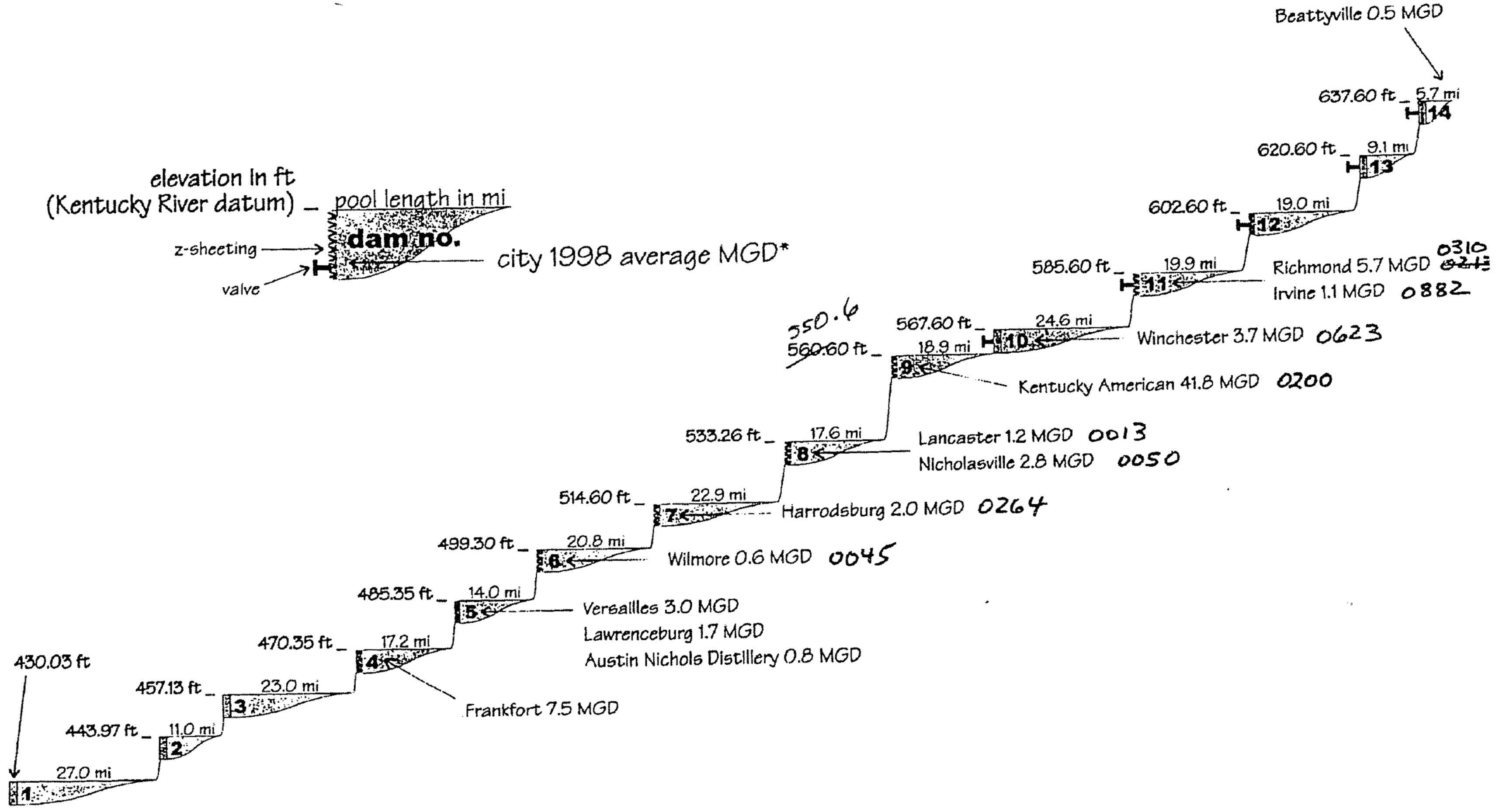



Figure 1. Map of Water Systems with Surface Sources in the Kentucky River Basin (Source: Water System Regionalization Feasibility Study, O'Brien & Gere, February 27, 2004)

# KENTUCKY RIVER PROFILE




*Information from Bluegrass Add-Vantage, vol. 22, number 3, June/July 1999.

Figure 2. Plot of Kentucky River Profile Showing Location of Locks and Water Supply River Intakes (Source: Water System Regionalization Feasibility Study, O'Brien & Gere, February 27, 2004)

Major surface water impoundments within the contributing watershed upstream of Lock 2 include Herrington Lake, Buckhorn Reservoir, and Carr Fork Reservoir. Herrington Lake is a recreation reservoir constructed in 1925 and is owned by the City of Herrington. The U.S. Army Corps of Engineers constructed Buckhorn Reservoir and Carr Fork Reservoir for flood control. Buckhorn Reservoir (drainage area, 408 square miles) was constructed in 1960, and Carr Fork Reservoir (drainage area, 58 square miles) was constructed in 1976. Carr Fork Lake has a surface area of 710 acres and normal pool storage of 7.4 billion gallons. Buckhorn Lake has a surface area of approximately 1,250 acres and normal pool storage of 10.5 billion gallons. Besides their main purpose of flood control, these two flood control reservoirs are also operated for recreation, impounding a seasonal pool in the spring and summer that is released during the fall to vacate storage for flood control. Releases from these two reservoirs appear to account for a significant absence of extreme low flows recorded on the Kentucky River following 1960.

The average daily discharges at Lock Nos. 2, 4, 6, and 10 were plotted for their respective periods of continuous record, and are presented in Figures 3, 4, 5, and 6, respectively. Examination of these graphs shows that prior to 1960 the daily average flow in the Kentucky River was below 50 cfs (32 mgd) on several occasions, especially at Lock 10. After 1960, the streamflow data show that the low flows rarely fell below 100 cfs (65 mgd).

**Safe Yield at Lock 2**

The USGS estimates of daily riverflow at Lock 2 were analyzed to estimate the safe yield of the Kentucky River at Pool 3 for this period of record. The analysis was limited to looking at only published USGS daily riverflow data and does not include storage contributions from the pool created by Lock 2 or releases from the upstream locks. Lock seepage and minimum flowby (if any is required) at Lock 2 were neglected. USGS estimates of daily riverflow at Lock Nos. 4, 6, and 10 were also reviewed as secondary information to substantiate the riverflow estimates at Lock 2.

The average flow at Lock 2 is 8,400 cfs (5,426 mgd). The lowest daily average flow recorded at Lock 2 was 20 cfs (13 mgd), which occurred on July 8, 1930. The 7-day minimum flow during the 1930 drought was 64 cfs (41 mgd). After the construction of Buckhorn Reservoir in 1960, the lowest daily average flow recorded at Lock 2 was 112 cfs (72 mgd), which occurred on September 16, 1999. The gaging station records at Lock Nos. 4 and 6 correlate well with the records at Lock 2 after accounting for their respective contributing drainage areas. Flow at Lock 10 for the 1999 drought, however, was substantially lower. One possible reason for this apparent anomaly is the fact that Lock 10 is located upstream of Lexington and is not influenced by wastewater releases from downstream communities that could tend to moderate the extreme fluctuations in natural low flows in the Kentucky River.

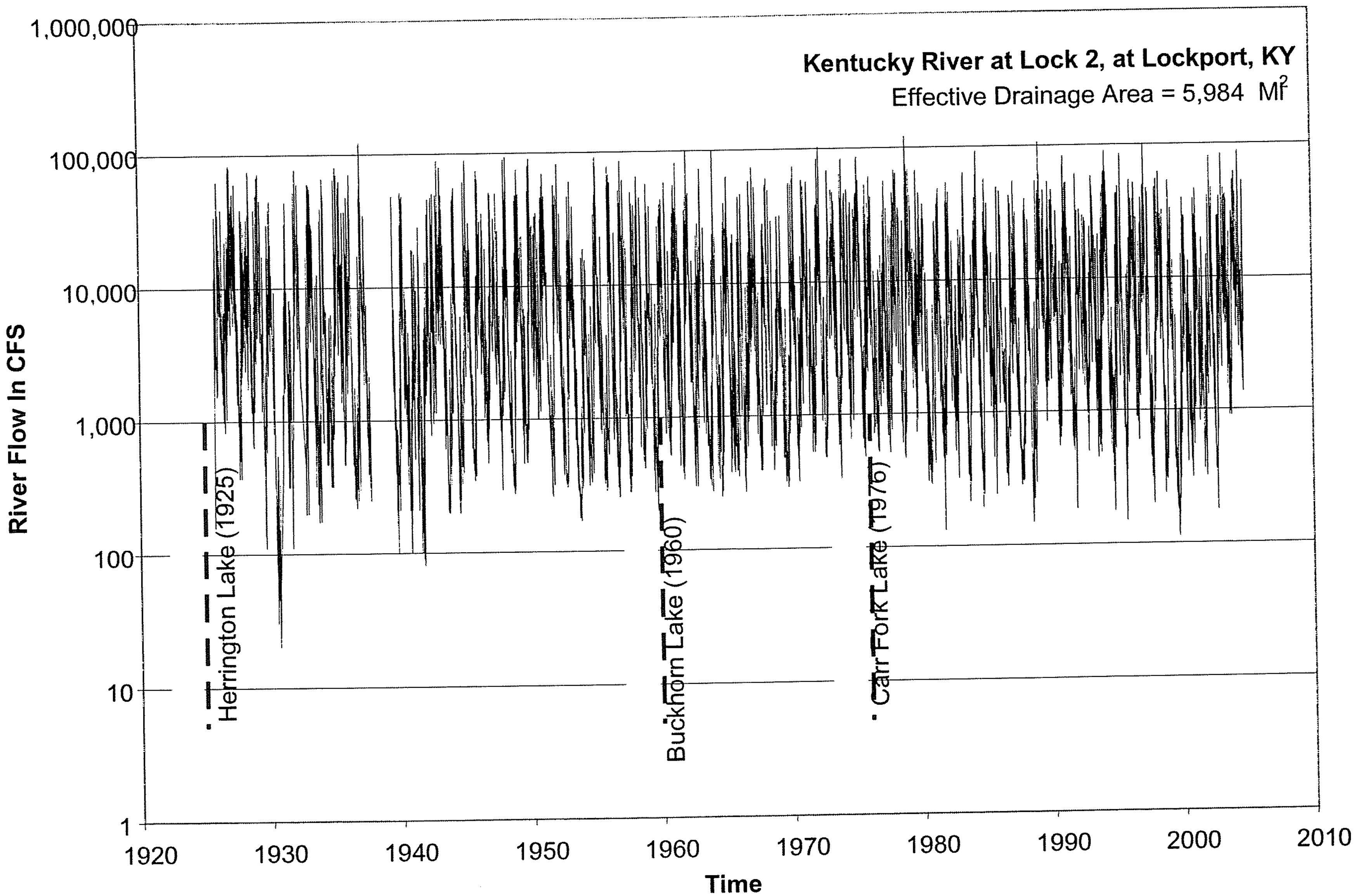



Figure 3. Plot of Daily River Flow Recorded at Lock 2 (USGS Gaging Station No. 03290500) from 1925 to Current Year

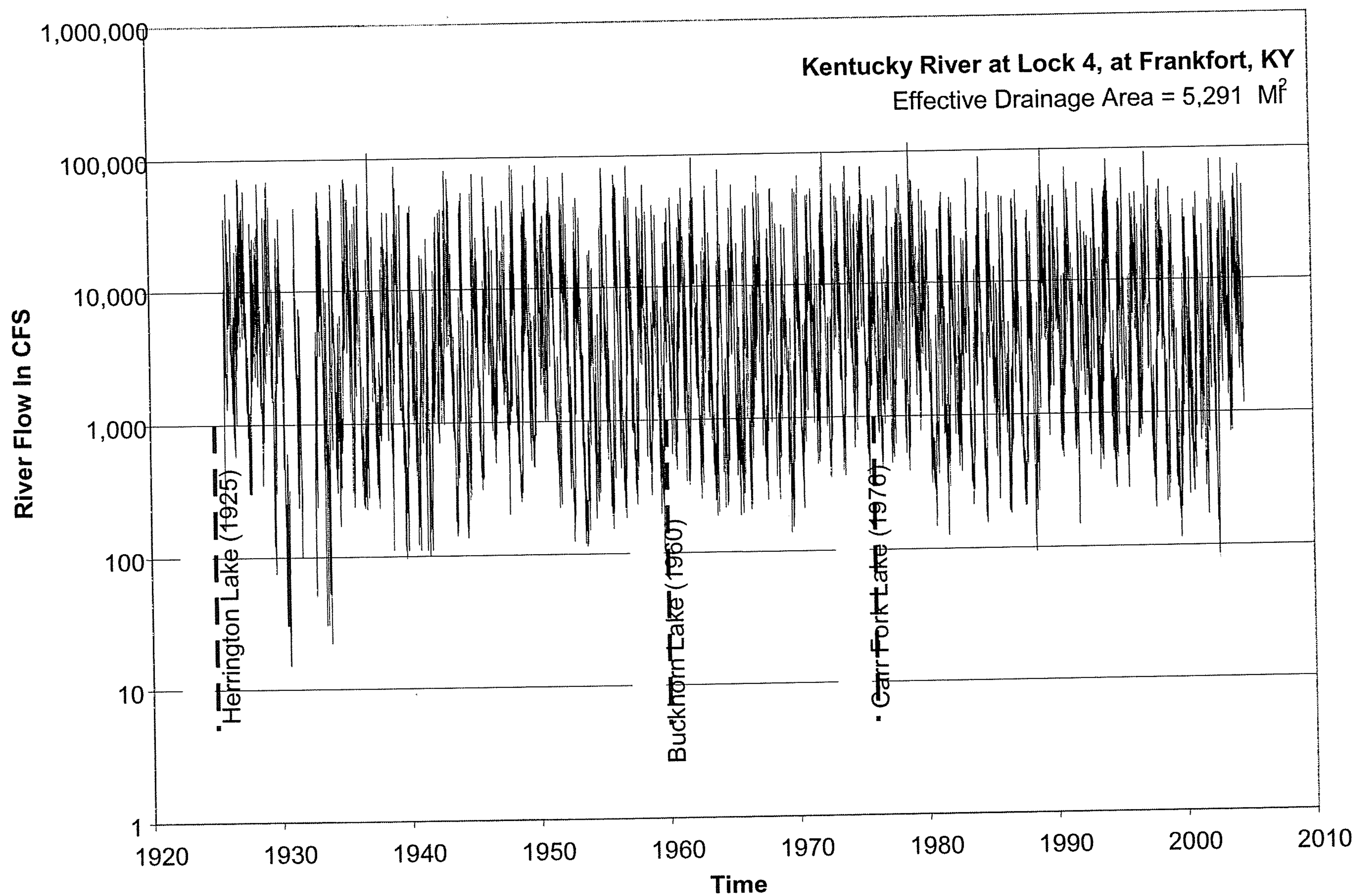



Figure 4. Plot of Daily River Flow Recorded at Lock 4 (USGS Gaging Station No. 03287500) from 1925 to Current Year

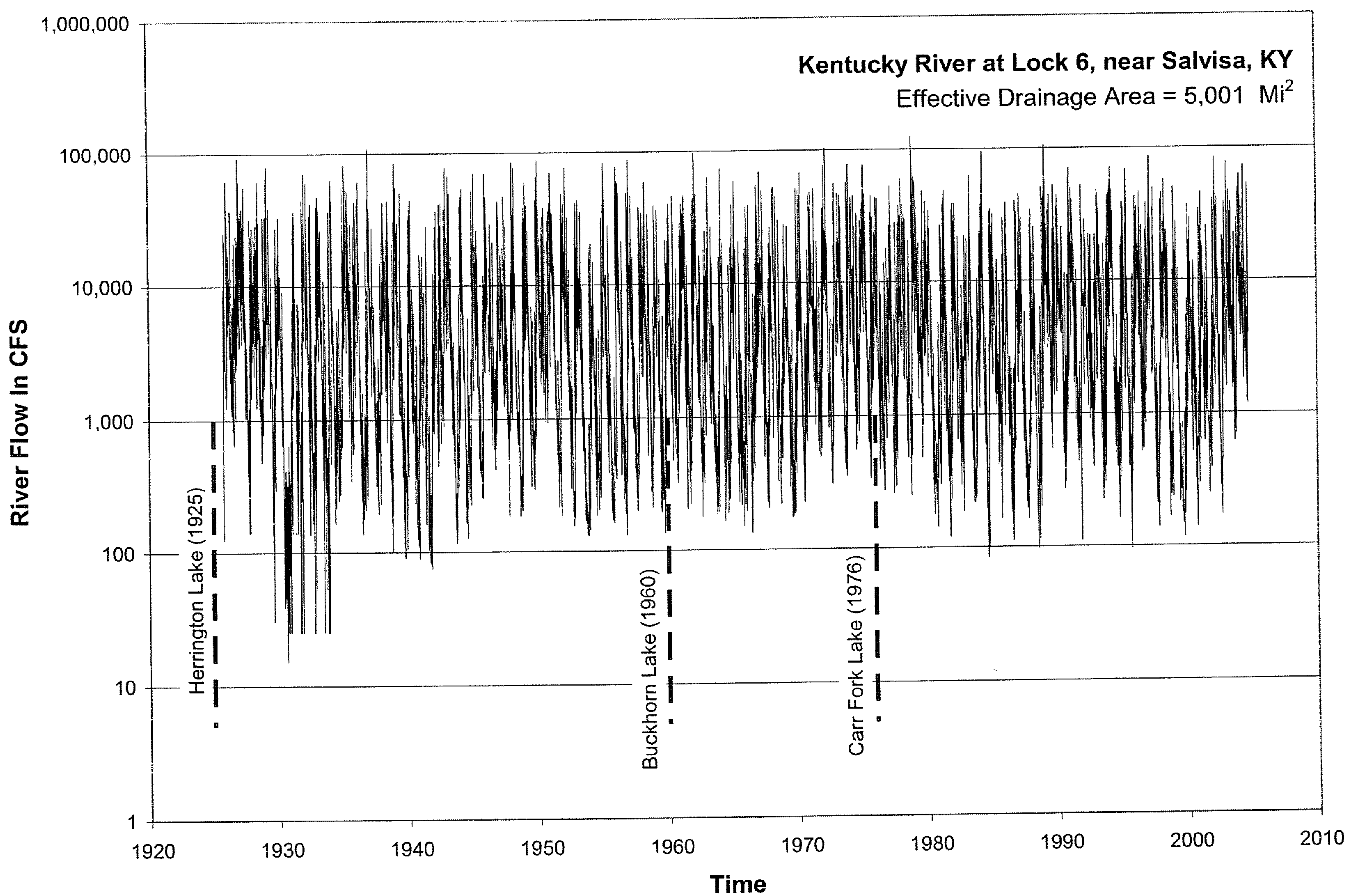



Figure 5. Plot of Daily River Flow Recorded at Lock 6 (USGS Gaging Station No. 03287000) from 1925 to Current Year

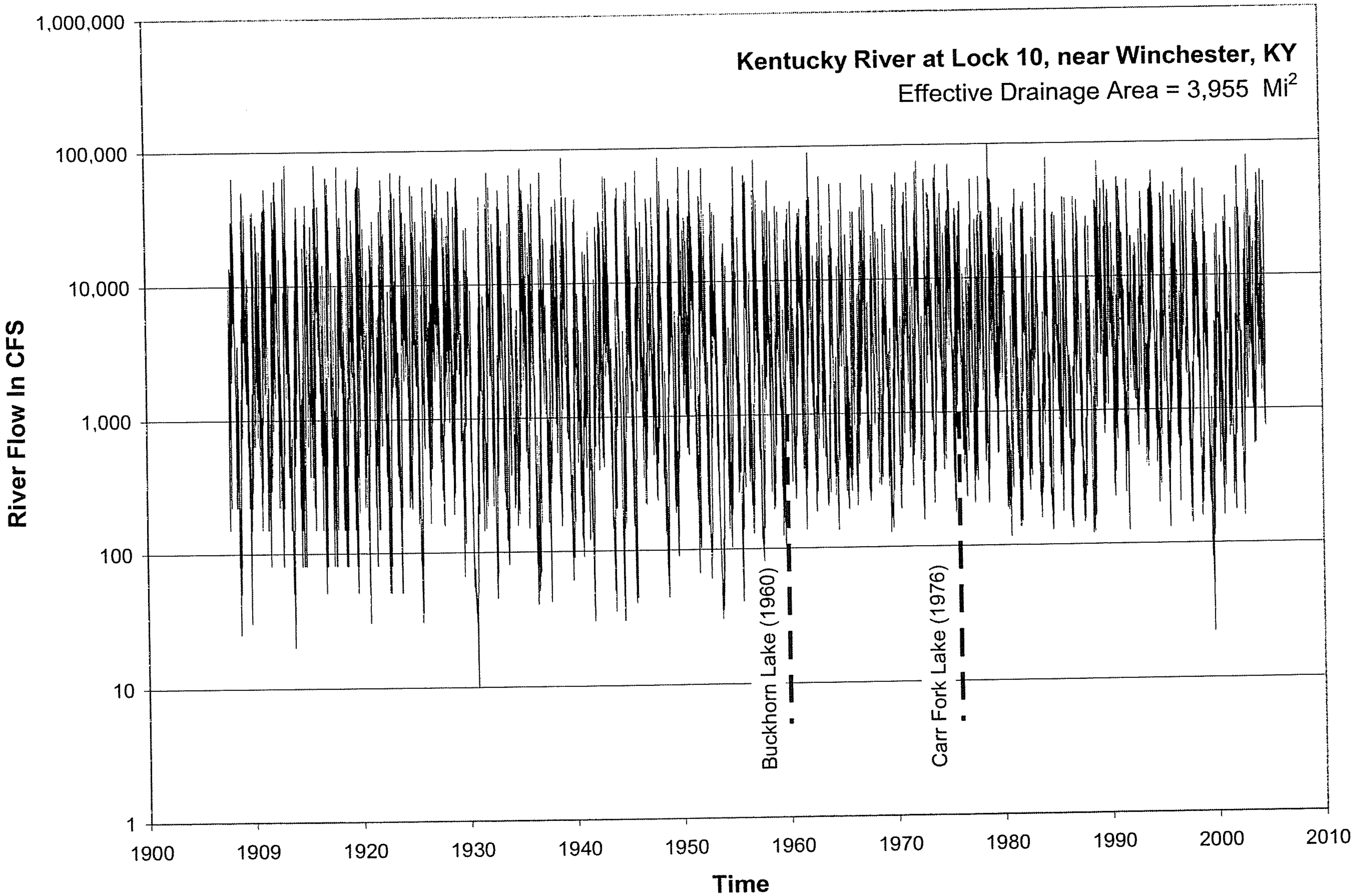



Figure 6. Plot of Daily River Flow Recorded at Lock 10 (USGS Gaging Station No. 03284000) from 1907 to Current Year

## Summary

Based on the USGS gaging station data, it appears that Pool 3 has a safe yield significantly greater than 30 mgd. The lowest recorded daily average flow of 13 mgd at Lock 2 that occurred on July 8, 1930 was prior to the upstream regulation that has occurred since this extreme drought event. Since construction of Buckhorn Reservoir in 1960, the lowest daily average flow recorded at Lock 2 was 72 mgd, which occurred on September 16, 1999. Another important consideration is the fact that the water withdrawn from Pool 3 will be treated and pumped upstream to Lexington and other users, and then returned to the Kentucky River upstream of Pool 3 as treated wastewater (minus consumptive use).

Based on the information reviewed, Pool 3 of the Kentucky River has a safe yield in excess of 30 mgd.

# *Appendix B*

## Preliminary Design Criteria
## KAW Kentucky River Pool 3 WTP Project

**Preliminary Design Criteria**

**KAW Kentucky River Pool 3 WTP Project**

*Facility Capacity*

The proposed facility will have a capacity of 20 mgd, expandable to 30 mgd.

*Raw Water Intake*

The raw water intake and pumping station would be located at a site adjacent to Pool 3 with a normal water level of El. 457. The intake would be located in Pool 3 upstream from Lock and Dam 3. A cast-in-place concrete streambank intake would be comprised of two (2) 30-inch diameter wedge wire basket screens in a tee configuration, each with a capacity of 10 mgd. The facility would be designed for addition of a future third screen.

The screens would discharge into a forebay to which a single 42 inch diameter intake main would be connected. This intake main would convey gravity flow to a remote raw water pumping station sump. The main could be extremely deep due to the adjacent raw water pumping station location on the river bank.

*Raw Water Pumping Station*

The raw water pumping station would convey raw water to the water treatment plant site. Facilities at the pumping station would include:

- Two (2) 6 mgd and two (2) 12 mgd vertical turbine pumps with variable frequency drives, with provisions made for a third 12 mgd vertical turbine pump. The pumps would be designed to pump the maximum design flow with multiple pumps in operation.
- Surge control facilities.
- A potassium permanganate feed system located in an isolated room.
- Zebra mussel polymer feed equipment.
- Air burst system for intake screen cleaning.
- Emergency generator.
- 42-inch raw water main from the pumping station to the WTP.

The raw water pumping station would be located away from the river bank with a floor elevation above the 1937 flood level. The pumping station would have three (3) levels: the foundation at a sump level equivalent to the river intake, an intermediate flood-proofed ground floor main access level that would house the vertical turbine pump discharge head, discharge piping, generator, and chemical storage and feed equipment, and an elevated floor level with the motors and electrical equipment.

*Kentucky River Water Quality and Conceptual Treatment Process*

Kentucky River Station (KRS) Pool 9 water quality was evaluated as the basis for this study. Pool 9 water quality was indicated by KAW to be similar in nature to that of Pool 3, from which the proposed water treatment plant would be supplied. Monthly Pool 9 raw water quality data for the period from 2001 through 2005 and daily data for the first 10 months of 2005 were reviewed. USGS water quality data from Lock 2, for the period of record from 1972 through 1995, was also reviewed, although the sampling frequency was somewhat sporadic. A summary of the water quality is provided below.

- Kentucky River Pool 9 turbidity is moderately high. Average turbidity during the period reviewed was 26 nephelometric turbidity units (NTU). Maximum turbidity was 565 NTU. Pool 2 data appeared to be similar.
- Pool 9 pH is basic with an average value of 7.8 standard units and a maximum value of 8.5. Pool 2 USGS data indicated periods with pH as low as 6.1 standard units in association with low stream flow and elevated algal activity and carbon dioxide concentration.
- Pool 9 alkalinity is moderately high with average and maximum values of 84 and 150 milligrams per liter (mg/L), respectively. Pool 2 data appeared to be similar.
- Iron concentration is high with average and maximum values of 0.77 and 1.67 mg/L, respectively.
- Pool 2 manganese concentration is moderate with levels routinely exceeding the secondary maximum contaminant level (0.05 mg/L).
- Pool 2 arsenic concentration normally is below the detection limit, but was on occasion 4 micrograms per liter (ug/L).

- Pool 2 ammonia concentration (as Nitrogen) is normally below 0.1 mg/L, with a maximum of 0.24 mg/L.
- Pool 9 total organic carbon (TOC) concentration is moderate with average and maximum values of 2.7 and 4.8 mg/L, respectively.
- Pool 9 *Cryptosporidium* and *Giardia* have been monitored monthly since 2003. To date *Cryptosporidium* has not been detected. *Giardia* has been detected on six (6) occasions with a maximum concentration of 0.6 cysts per liter.
- Zebra mussels are reported by KAW to be present in the Kentucky River.

To effectively treat this turbid source, a process including conventional or high rate clarification and filtration followed by disinfection would be required. Oxidation with potassium permanganate is recommended for manganese control. Taste and odor control can be achieved with application of powdered activated carbon in a suitably designed contact basin, or via filter adsorbers with GAC.

Two (2) alternative treatment processes, both judged to be capable of meeting regulatory requirements, were evaluated for this study. Provisions for future UV disinfection were included with each process. The first process included oxidation using potassium permanganate applied at the raw water pumping station, flocculation – sedimentation with plate settlers, granular media filtration with provisions for GAC in lieu of anthracite if needed in the future, a clearwell designed for 1-log *Giardia* inactivation, and secondary chloramination. An alternate clarification process using ACTIFLO® was also evaluated.

Alternate membrane filtration (MF) technologies were also considered as an alternative to the more conventional granular media filtration for this turbid source. A decision was made not to utilize MF because there were not compelling cost, operations, or process reasons for its use in this application. Reasons for this decision are summarized below:

- To justify the use of MF to the KDOW and to determine appropriate design criteria, a pilot test would need to be performed. Testing covering four (4) seasons would be recommended. Following testing, KDOW review would be required and likely the proprietary membrane equipment would be pre-purchased following acceptable review of the pilot test report and its recommendations. Pre-purchasing the equipment would be necessary to form the basis for a final design because manufacturers systems vary significantly. This process could take 15 to 18 months, which would escalate project costs.

- Although capital costs for granular media filtration and MF are becoming competitive as membrane system costs decrease, the additional power, chemical, and membrane replacement costs associated with the MF system are significant and result in higher life cycle costs compared to granular media filtration.
- Both granular media filtration and MF are capable of meeting and exceeding Bin 1 classified source water treatment requirements.
- Use of MF precludes use of GAC adsorption in the original filter process, if necessary for future taste and odor control. If MF were used and GAC was necessary, an additional process would be required.

*WTP Site Facilities*

The water treatment plant would be located on a site having a moderate slope. This would allow water to flow across the site by gravity to finished water storage facilities. With this type of site, structures would be located at grade or higher and excavation could be minimized, if necessary, depending upon subsurface conditions. The facility would be configured with a unified water treatment plant structure housing administration, chemical storage, process trains, finished water storage, and high service pumping. Wastewater treatment facilities and a dewatering building would be separate facilities.

Site appurtenances would include:

- A chain link fence around the perimeter of the entire WTP site. The fence would be provided with:
    - A motorized access gate with keypad entry system and communications to the main control room.
    - A security barrier in front of the main gate to secure the site against forced entry via a moving vehicle.

- An electrification system to deter access over the fence and detect breeches of security and activate video surveillance.

- A paved access road around the WTP complex with parking facilities for WTP operations and administrative staff, chemical delivery, and maintenance.
- Sidewalks and walkways to allow for movement between buildings and other areas of the site.
- Chemical delivery area with retention facilities to contain a chemical spill.
- Fire hydrants.
- Storm water detention and conveyance system.
- Electrical substation.

*Administration Building*

The administration building would be the focal point and main entrance to the WTP, serving as both a control and operations center. Facilities would include:

- An architecturally treated entrance that would complement the design of the WTP.
- Control Room containing the computer interface between the operator and the WTP facilities to allow for monitoring and control of all processes.
- Supervisory Control and Data Acquisition (SCADA) room containing the facilities that support the computer control system and house the communications network that allows for monitoring and control of remote sites.
- Two offices.
- Office Storage Room for storing related supplies.
- Conference Room/Lunch Room.
- Operator's laboratory including:
    - Wet Chemistry Laboratory
    - Bacteriological Laboratory
    - Storage Room
- Men's and Women's Lavatories.
- Men's and Women's Locker Rooms.

- Janitors Closet.
- Battery Room for back up power supply for SCADA system

*Chemical Storage and Feed Facilities*

Chemical feed data for the Kentucky River Station (KRS) were reviewed and considered for this study. Tables 1 and 2 list chemical feed rates based on historical data for each chemical currently applied at the KRS. Potassium permanganate is not currently applied, but has been included to allow minimizing pre-chlorine application. Two coagulants, ferric chloride and polyaluminum chloride, were included in the historical data. Polyaluminum chloride was used as the basis for design. Potassium permanganate would be included at the raw water pumping station for zebra mussel control with provisions for a future zebra mussel polymer. Wastewater polymers would be provided for filter backwash clarification and residuals dewatering. Storage quantities are based upon providing 30 days of storage at average feed rates and average day design flow. Liquid storage volumes in the tables were rounded up or sized to accept a full truckload shipment.

**Table 1**

**Pre-Treatment Chemical Application Rates and Storage Requirements**

| | Carbon | Polyaluminum Chloride | Coagulant Aid Polymer | Potassium Permanganate |
|---|---|---|---|---|
| Average, mg/L | 1.2 | 19 | 0.2 | 1.0 |
| Maximum, mg/L | 2.2 | 106 | 0.4 | 2.0 |
| Storage, lbs | 16,000 | 98,000 | 1,035 | 5,000 |
| Storage, gallons | NA[1] | 30,000 | 120 | NA[1] |

**Table 2**

**Post-Treatment Chemical Application Rates and Storage Requirements**

| | Ammonia | Caustic Soda | Corrosion Inhibitor | Fluoride | Chlorine |
|---|---|---|---|---|---|
| Average, mg/L | 1.1 | 2.6 | 2.9 | 1 | 6.4 |
| Maximum, mg/L | 2.1 | 21.0 | 15.6 | 1.3 | 9.7 |
| Storage, lbs | 4,000 | 9,000 | 10,000 | 3,500 | 21,300 |
| Storage, gallons[2] | NA[1] | 4,000 (25%) | 4,000 | 4,000 | NA[1] |

[1]NA = Not Applicable [2]4,000 gallon truckload used when calculated volume less than 4,000 gallons

Pre- and post-treatment chemical feed and storage equipment would be housed in a chemical building, integral with the process, administrative, and pumping facilities. The chemical facility would include:

- An architecturally treated building that would complement the design of the WTP.
- Unloading area with spill containment for delivery of chemicals.
- Storage for bulk delivery of all chemicals.
- Gas feed equipment for application of chlorine and chlorine scrubber system.
- Gas feed equipment for ammonia.
- Redundant liquid metering pumps for application of all liquid chemicals.
- Dry feeders for potassium permanganate (located at raw water pumping station).
- Redundant units for each feed system to assure continuous plant operation during equipment outages and maintenance.
- Feed and delivery areas with eyewash and showers.
- Individual rooms with spill containment for each chemical.
- Control system for automation of each chemical.

*Treatment Process Facilities*

A unified building concept would be utilized, with a single structure for all process components, with the exception of the wastewater facilities. The facility would include hydraulic and physical layout considerations for potential future processes. All facilities would be cast-in-place concrete construction. The following process units were included in the design criteria:

- Rapid mixer basin
  - Two (2) vertical turbine mixers (in series)
  - Ten (10) second detention time at maximum flow
  - No superstructure
- Flocculation basins
  - Three-stage mixing with horizontal reels
  - Thirty (30) minute detention time at maximum flow
  - Four (4) basins, each designed for one fourth of the maximum flow, with provisions made for two (2) additional basins.
  - No superstructure
- Sedimentation basins with plate settlers
  - Effective surface loading rate of 0.3 gpm/sf of plate area
  - Hoseless vacuum-type sludge removal equipment
  - Four (4) basins, each designed for one fourth of the maximum flow, with provisions made for two (2) additional basins.
  - No superstructure
- Filters
  - 5 gpm/sf surface loading rate with one filter out of service at maximum flow
  - Sand and anthracite media
  - Extra depth provided for possible future conversion to deep bed or filter adsorber with GAC
  - Five (5) filters, with provisions made for two (2) additional filters.
  - Superstructure
- Clearwells
  - 1.0-log inactivation value for *Giardia* with chlorine disinfection
  - 0.7 baffle factor
  - Two (2) clearwells so that either can be taken out of service for cleaning or maintenance while leaving the other in service
  - Covered with pre-cast concrete planks and membrane

Presedimentation may be required by state regulators. Design criteria developed for this facility were based on the following assumptions:

- Presedimentation basin
  - One (1) hour detention time
  - Hoseless vacuum-type sludge removal equipment
  - No superstructure

Future source water assessment and subsequent Bin Classification in accordance with the Long Term 2 Enhanced Surface Water Treatment Rule may necessitate UV disinfection. Design criteria developed for this facility were based on the following assumptions:

- UV disinfection system
  - 3.0-log inactivation value for *Cryptosporidium* and *Giardia*
  - Two (2) low pressure UV reactors, each capable of treating the maximum flow
  - Superstructure

*Treated Water Pumping Station*

The pumping station would transmit water withdrawn from the clearwell to the distribution system. Design criteria include the following facilities:

- Four (4) vertical turbine pump units
  - Two (2) 7 mgd pumps
  - Two (2) 10 mgd pumps
  - Provisions for a 6 mgd pump
  - Constant speed motors on the 7 mgd units
  - VFDs on the 10 mgd units
  - Capability to pump maximum plant flow with the largest pump out of service
  - Provisions to pump maximum flow with multiple units in operation.
- Two (2) washwater pumps
- Surge control facilities

- Traveling bridge crane to facilitate pump removal and maintenance

*Wastewater and Residuals Handling Facilities*

The wastewater and residuals handling processes would include filter wastewater clarification and sludge thickening and dewatering. Facilities would include two (2) wastewater clarifiers, two (2) sludge thickeners, a building to house the clarifier and thickener piping and control functions, and a sludge dewatering building to house belt filter presses and sludge conditioning polymer equipment. Design criteria include the following facilities:

- Wastewater clarifiers
    - Two (2) circular clarifiers
    - Each clarifier to batch fill, settle, and decant backwash and rinse wastewater for one filter in 6 hours
    - Includes sludge scraper equipment
    - Uncovered
    - Ability for one unit to act as a thickener.
- Sludge thickener
    - One (1) circular sludge thickener
    - Storage to equalize sludge production during high turbidity events
    - Maximum loading rate of 5 pounds dry solids per day per square foot (lbs/day/sf) of surface area
    - Uncovered
- Wastewater control building
    - Three (3) redundant clarifier sludge transfer pumps
    - Three (3) redundant thickened sludge transfer pumps
    - Three (3) redundant clarified wastewater recycle pumps
    - Houses transfer piping, valves, and control panels
- Sludge dewatering building
    - Two (2) belt filter presses
    - Polymer feed equipment for sludge thickener and belt filter presses
    - Space for a future belt filter press for WTP expansion to 30 mgd
    - Conveyor to transfer dewatered sludge to storage bins

*Instrumentation and Control System*

The WTP would be designed to operate in a totally automated, semi-automated, or manual mode. A SCADA system would be used to monitor and control the intake/raw water pumping station, the WTP, the treated water pumping station, the wastewater processes, and the remote facilities. The SCADA system would collect and analyze real-time data, store the information in a historical data base, and provide summary reports and graphs. The SCADA system would consist of PLCs that are connected together to form a network. The Operator interface with the system would be accomplished through personal computer workstations located in the Control Room and network connections located throughout the WTP. Provisions for network connections would be provided in the Control Room, on the filter operating floor, and in the chemical feed area, raw water pumping station, treated water (high service) pumping station, and wastewater facilities. These connections would allow for plant operations and off-site monitoring and control. Fiber optic data cabling and modems would be used to network the PLCs. A telemetry system would bring data back to the WTP site from remote facilities.

*Telemetry System*

A telemetry system would be provided to maintain communications between remote sites and the WTP. The system would transmit control, status, operational data, and alarms. The system would include facilities at the:

- Raw Water Pumping Station
- Water Treatment Plant
- Booster Pumping Station
- Kentucky River Station

*Special Systems*

Special systems would be provided to support WTP operations. These systems would include the following:

- Telephone/Intercom System
- Security System including:
    - Computer-Based Central Monitoring and Alarm
    - Exterior and Interior Video Monitoring
    - Door Switches
    - Window Switches

  - Access Keypads
  - Motion Detectors
- Fire Detection System including:
  - Smoke Detectors
  - Heat Detectors
  - Pull Box Stations
  - Annunciator (Horns and Strobe Lights) Stations

# *Appendix C*

**Transmission Main Route Evaluation**
**KAW Kentucky River Pool 3 WTP Project**

**Transmission Main Route Evaluation**

**KAW Kentucky River Pool 3 WTP Project**

*General*

Five (5) potential intake/Raw Water Pumping Station (RWPS) sites and six (6) potential Water Treatment Plant (WTP) sites were identified, as shown on Exhibit A. Four (4) combinations of these sites and six (6) treated water transmission main routes were evaluated in detail. The RWPS#2 and WTP#3 potential sites were eliminated from consideration during preliminary screening of alternatives.

*RWPS#1 and WTP#1/WTP#2 Project*

The intake for this water supply project would be located just upstream from Lock and Dam No. 3 on the Kentucky River. Raw water would be pumped from the Kentucky River to either WTP#1 (north of SSR 607) or WTP#2 (south of SSR 607) through RWPS#1. The raw water main would be 4.07 miles in length, and would follow SR 127 and SSR 607 for most of its length, as shown on Exhibit B.

Treated water from either WTP#1 or WTP#2 would be pumped through a 42-inch main to the KAW Central Division distribution system, which includes Lexington-Fayette County and parts of six (6) surrounding counties. Two (2) alternate routes were identified and evaluated, as shown on Exhibits C and D. One of the routes would follow SR 368 (Cedar Creek Road/Cedar Road) southeast to SR 227, as shown on Exhibit C. The route would then follow SR 227 southeast through Stamping Ground to SR 460 (Frankfort Road). From SR 460, the route would follow Cane Run Road south to Ironworks Pike, then would follow Ironworks Pike southeast to the termination point at SR 922 (Newtown Pike). Total length of this route would be 32.40 miles.

The other alternate transmission main route would follow an existing power line right-of-way for part of the route, as shown on Exhibit D, from the WTP site to Snavely Road, then along Snavely Road to SR 368. From that point the route would be the same as the first alternate route. Total length of this route would be 31.22 miles.

For both alternate routes, the intermediate storage tank and booster pumping station would be located on high ground southeast of Stamping Ground. Hydraulic grade lines (HGL) for 20 and 30 mgd supply from the WTP and with the treated water main route profiles for the two alternate routes are shown on Exhibit E (Road) and Exhibit F (ROW). The gradient at the termination point was set at 1,170 feet for all evaluations. Similarly, the height of the intermediate storage tank was limited to 100 feet, which would result in an overflow elevation of 957 feet.

*RWPS#3 and WTP#4 Project*

The intake for this water supply project would be located about 2.5 miles upstream from Lock and Dam No. 3 on the Kentucky River. Raw water would be pumped from the Kentucky River to WTP#4 through RWPS#3. The raw water main would be 2.20 miles in length, and would generally follow the valley formed by a tributary to the Kentucky River, as shown on Exhibit G.

Treated water from WTP#4 would be pumped through a 42-inch main to the KAW Central Division distribution system, which includes Lexington-Fayette County and parts of six (6) surrounding counties. Two (2) alternate routes were identified and evaluated, as shown on Exhibits H and I. The Stamping Ground route from WTP#4 would follow Old Frankfort Pike and SSR 607 to SR 127, as shown on Exhibit H. From there, the route would be the same as that used for the RWPS#1/WTP#1 project. Total length of this route would be 33.58 miles.

The other alternate route for the RWPS#3/WTP#4 project would follow Old Frankfort Pike south to SR 127, then south along SR 127 to SR 2919, as shown on Exhibit I. The route would follow SR 2919 through Peaks Mill and continue southeast along Peaks Mill Road, Rocky Branch Road, and SR 1262 to SR 1688, where it would turn southwest and follow SR 1688 to SR 460 (Georgetown Road). The Peaks Mill route would then follow SR 460 east to SR 1973 (Ironworks Pike), then follow Ironworks Pike southeast to the termination point at SR 922 (Newtown Pike). Total length of this route would be 32.55 miles.

For the Stamping Ground route, the intermediate storage tank and booster pumping station would be located on high ground southeast of Stamping Ground, which would be the same location as that for the RWPS#1/WTP#1 project. For the Peaks Mill route, the intermediate storage tank and booster pumping station would be located near the intersection of SR 1262 and SR 1688, north of SR 460. Hydraulic grade lines (HGL) for 20 and 30 mgd supply from the WTP and the treated water main route profiles for the two alternate routes are shown on Exhibit J (Stamping Ground) and Exhibit K (Peaks Mill). The gradient at the termination point was set at 1,170 feet for all evaluations. Similarly, the height of the intermediate storage tank for the Stamping Ground route was limited to 100 feet, which resulted in an overflow elevation of 975 feet. Based on land availability, the overflow elevation of the intermediate storage tank for the Peaks Mill route was set at 910 feet.

*RWPS#4 and WTP#5 Project*

The intake for this water supply project would be located about 6.0 miles upstream from Lock and Dam No. 3 on the Kentucky River. Raw water would be pumped from the Kentucky River to WTP#5 through RWPS#4. The raw water main would be 0.56 miles in length, and would require cross-county construction up a steep incline to a WTP located on the bluff above, as shown on Exhibit L.

Treated water from WTP#5 would be pumped through a 42-inch main to the KAW Central Division distribution system, which includes Lexington-Fayette County and parts of six (6) surrounding counties. The treated water transmission main route is shown on Exhibit M, and would follow the Peaks Mill route described previously for the RWPS#3/WTP#4 project. The intermediate storage tank and booster pumping station location would also be the same. Hydraulic grade lines (HGL) for 20 and 30 mgd supply from the WTP and the treated water main route profile are shown on Exhibit N. The gradient at the termination point was set at 1,170 feet for all evaluations. Similarly, the overflow elevation of the intermediate storage tank for the Peaks Mill route was set at 910 feet.

*RWPS#5 and WTP#6 Project*

The intake for this water supply project would be located about 10.0 miles upstream from Lock and Dam No. 3 on the Kentucky River. Raw water would be pumped from the Kentucky River to WTP#6 through RWPS#5. The raw water main would be 1.73 miles in length, as shown on Exhibit O.

Treated water from WTP#6 would be pumped through a 42-inch main to the KAW Central Division distribution system, which includes Lexington-Fayette County and parts of six (6) surrounding counties. The treated water transmission main route is shown on Exhibit P, and would follow the Peak Mill route described previously for the RWPS#3/WTP#4 project. The intermediate storage tank and booster pumping station location would also be the same. Hydraulic grade lines (HGL) for 20 and 30 mgd supply from the WTP and the treated water main route profile are shown on Exhibit Q. The gradient at the termination point was set at 1,170 feet for all evaluations. Similarly, the overflow elevation of the intermediate storage tank for the Peaks Mill route was set at 910 feet.

*Hydraulic Data Summary*

The hydraulic data provided on the exhibits are summarized in Table 1. As shown, discharge pressure at the WTP for the alternative KAW water supply projects would range between 67 and 106 psi when demand is 20 mgd. Lower discharge pressures would be associated with the higher elevation potential WTP locations and the Peaks Mill route, in large part because of the lower overflow elevation of the intermediate storage tank that would be associated with this route. Booster pump discharge pressure would be about 165 to 167 psi for either of the routes at 20 mgd.

## Table 1

## Treated Water Transmission Main Hydraulic Data Summary

| Project | Route | Route Alternate | WTP Elevation (ft) | WTP Discharge Pressure (psi) | | Storage Tank Overflow Elevation (ft) | Booster Pump Discharge Pressure | | Highest Pressure to Low Elevation Area | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | 20 mgd | 30 mgd | | 20 mgd | 30 mgd | 20 mgd | 30 mgd |
| RWPS#1/WTP#1 | Stamping Ground | Road | 780 | 106 | 143 | 957 | 167 | 201 | 200 | 233 |
| RWPS#1/WTP#1 | Stamping Ground | ROW | 780 | 103 | 138 | 957 | 167 | 201 | 200 | 233 |
| RWPS#3/WTP#4 | Stamping Ground | --- | 820 | 97 | 137 | 957 | 167 | 201 | 200 | 233 |
| RWPS#3/WTP#4 | Peaks Mill | --- | 820 | 67 | 100 | 910 | 165 | 205 | 208 | 243 |
| RWPS#4/WTP#5 | Peaks Mill | --- | 760 | 90 | 118 | 910 | 165 | 205 | 208 | 243 |
| RWPS#5/WTP#6 | Peaks Mill | --- | 720 | 105 | 131 | 910 | 165 | 205 | 208 | 243 |

**KENTUCKY-AMERICAN WATER COMPANY**
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**AND REQUEST FOR PRODUCTION OF DOCUMENTS**


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**Witness: Linda C. Bridwell**

7. Refer to Kentucky-American's application at Exhibit B, Volume II, Drawing 18. This drawing shows the proposed pipeline crossing existing 12-inch and 8-inch water mains.

   a. Provide the names and addresses of the owners of these water mains.

   b. State whether Bluegrass Water Supply Commission ("BWSC") or Kentucky-American has considered connecting the proposed water main with either of the two existing water mains.

**<u>Response</u>:**

a. The proposed water line crosses an existing 12-inch, 8-inch, and 4-inch water main on the drawing identified. The owner of these mains is Georgetown Municipal Water & Sewer Service, P O Box 640, 125 W. Clinton St., Georgetown, KY 40324.

b. KAW is not aware of the considerations of the BWSC and specific connection points have not been identified during conversations about the project. Kentucky American Water however, in its hydraulic modeling efforts, has identified the 16-inch water main presented on Drawing 16 of Exhibit B, Volume II, as a probable connection point.

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**Witness: Nick O. Rowe**

8. State whether Kentucky-American will be able to provide wholesale water service through the proposed transmission main to any public water suppliers along the proposed route of the water transmission main. Explain.

**Response:**

Yes. There are four public water suppliers adjacent to the transmission line route including Georgetown Municipal Water and Sewer Service, Frankfort Water and Electric Plant Board ("FWEPB") (who are both members of the BWSC), Peaks Mill Water District in Franklin County and Elkhorn Water District in Franklin County. KAW's current Sale for Resale tariff is higher than the rate that the two districts pay to their existing supplier, the FWEPB, so KAW does not anticipate replacing any existing supply, but could envision a supplemental supply. Clearly KAW would consider any request as part of its overall capacity plan and if the request required construction of additional capacity the cost would need to be borne by the purchaser.

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**Witness:** **Nick O. Rowe**

9. State whether Kentucky-American will be able to provide retail water service through the proposed transmission main directly to persons or entities located along the proposed transmission main's route. Explain.

**Response:**

KAW will not compromise the integrity of the water transmission main with individual corporation stops, connections or taps of either 5/8" or 1" size. Further, KAW is prohibited from providing retail water service within the service territory of a water district without the written authorization from the district. At this time KAW believes all but one property along the transmission line already has access to public water service from one of the four providers listed in the response to Item 8 of this same data request. KAW would anticipate providing retail water service through the proposed transmission main only if requested by another water provider and only if it can be done without risk to the integrity of the main, for example through a 6" or larger connection that then could be reduced down to the request service size.

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**Witness: Richard C. Svindland**

10. According to Exhibit D of Kentucky-American's application, the proposed water transmission main will connect to existing Kentucky-American facilities at the intersection of Ironworks Pike and Newtown Pike in Fayette County.

    a. Describe the extent of the hydraulic impact upon Kentucky-American's system when the proposed water treatment plant is producing at the following rates:

        (1) 6 million gallons per day ("MGD");
        (2) 13 MGD;
        (3) 20 MGD;
        (4) 25 MGD; and,
        (5) 30 MGD.

    b. Provide all hydraulic analyses and modeling that Kentucky-American has conducted reflecting the operation of Kentucky-American's treatment and distribution system with the proposed facilities while operating at the levels of production set forth in Item 10(a) above.

    c. List and describe each system improvement on the existing Kentucky-American system beyond the connection at Ironworks Pike and Newtown Pike necessary to accommodate water transported from the proposed water treatment plant. State the cost of each improvement.

**Response:**

a. Please refer to the attachment which are pressure contour maps of KAW's system under the referenced flow rates. In addition to the referenced flow, pressure contour maps are provided for two existing flow conditions so as to make a comparison.

    (1) At 6 MGD, there is no impact to KAW system as illustrated between slides 1 and 3 in the referenced attachment.
    (2) At 13 MGD, there is a slight increase in pressure for a portion of the system as shown on slide 4. The pressure increase is in the order of 6 psi.

(3) At 20 MGD, there is a slight increase in pressure for a portion of the system as shown on slide 5. The pressure increase is in the order of an additional 7 psi.

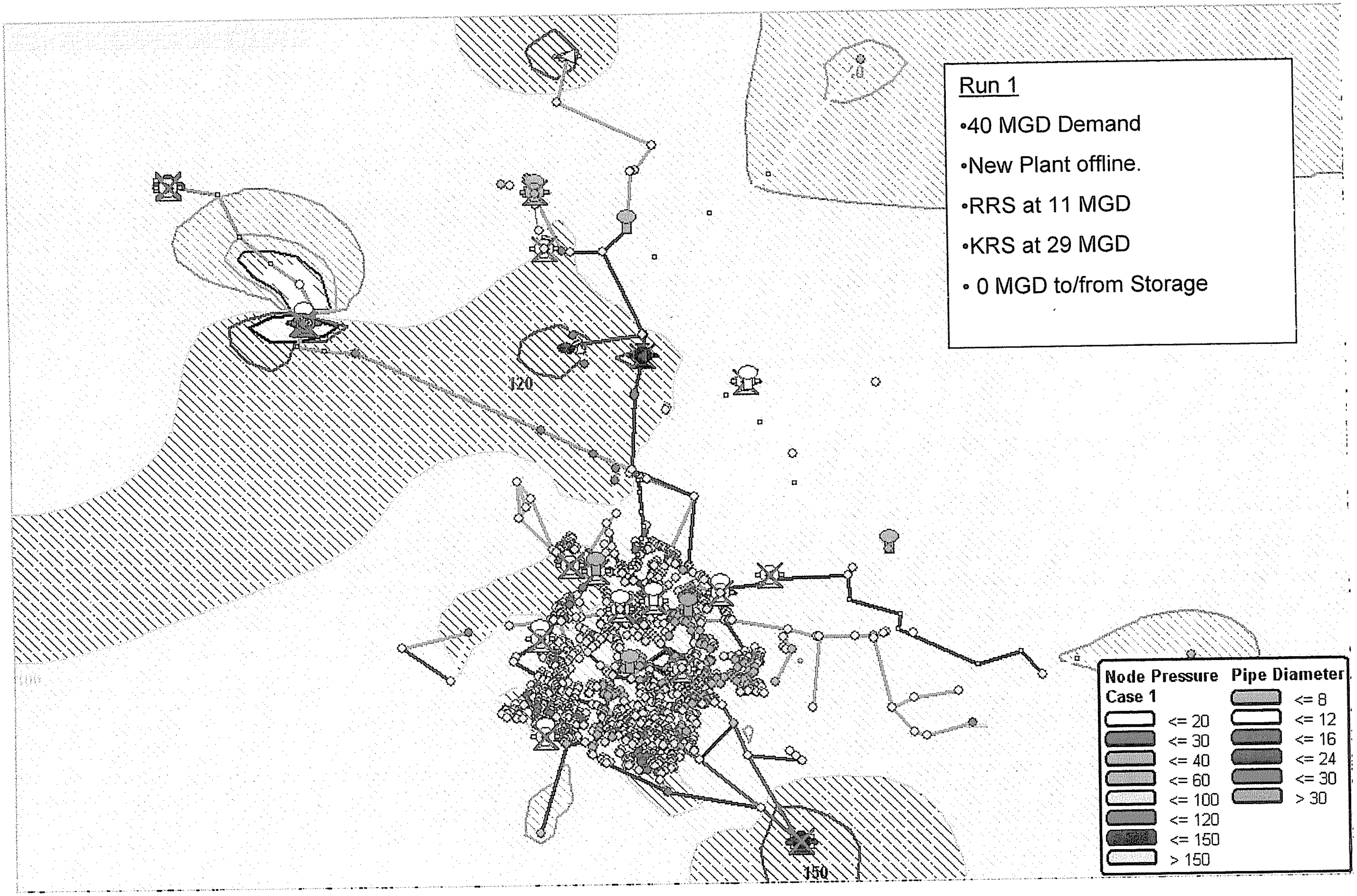
(4) At 25 MGD, there is a slight increase in pressure for a portion of the system as shown on slide 6. The pressure increase is in the order of an additional 5 psi

(5) At 30 MGD, there is a slight increase in pressure for a portion of the system as shown on slide 7. The pressure increase is in the order of an additional 8 psi. Thus total increase in pressure above existing condition is approx. 30 psi.

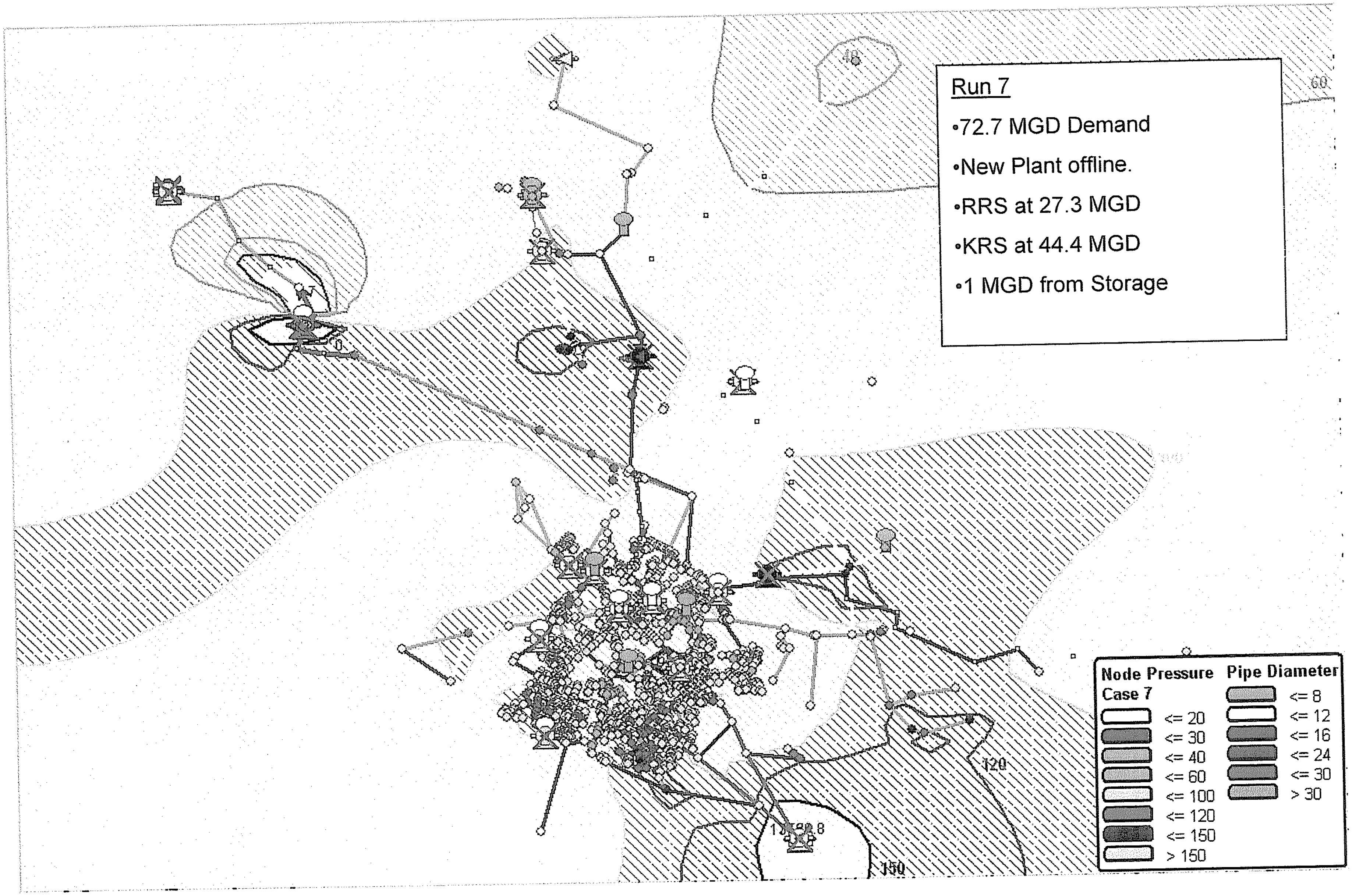
As seen on slide 7, the area with pressures above 150 psi in on the new line only. Thus it is anticipated that none of KAW's existing customers will have pressure above 150 psi. If there are remote instances where customers would have pressure above 150 psi, KAW will install individual PRV's in each customers meter box.

b. A static hydraulic model output file for the above referenced cases is being provided on a CD because it contains 1189 pages. Strand Associates is currently working on extended period simulations hydraulic models to further refine the operational aspects of the new plant and the existing plants. A copy of Strand's work will be forwarded upon completion, if so requested.

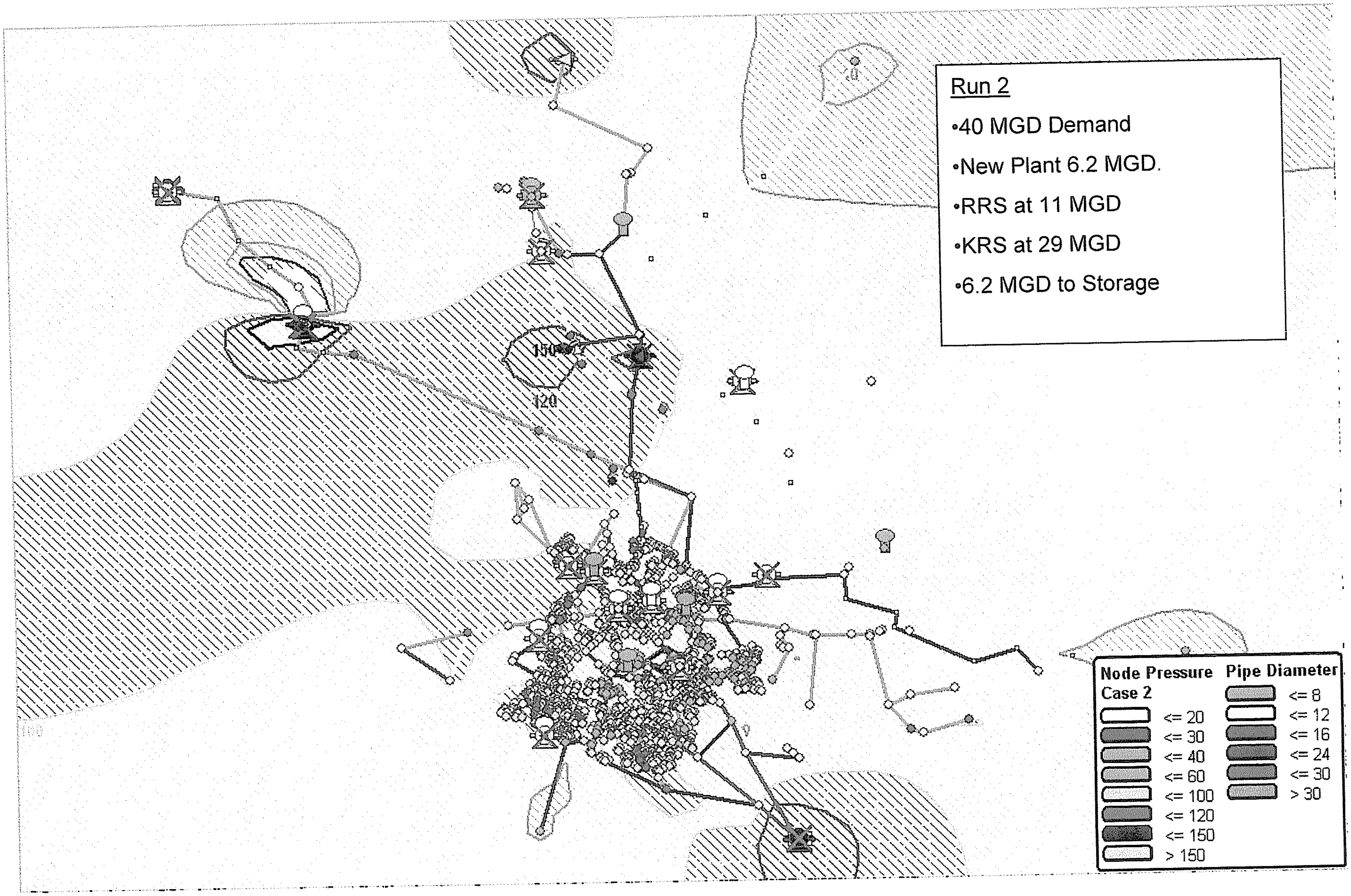
c. There are three needed improvements to convey KAW's needed capacity from the new water treatment plant into KAW's existing distribution system. These three improvements are the installation of 25,000 feet of 24-inch main along Newtown Pike from Ironworks to New Circle Road, the second is the installation of 1625 feet of 20-inch main along New Circle Road between Georgetown Road and Newtown Pike at a cost of $410,000 and the final is a 2,300 feet of 12-inch main along Citation between McGrathiana and Prescott at a estimated cost of $115,000. 10,000 feet along Newtown Pike is currently being replaced as part of a Transportation Cabinet widening project from Ironworks to Interstate 75 at a total cost to KAW of $340,000. The additional work on Newtown Pike is estimated at $3.75 million.



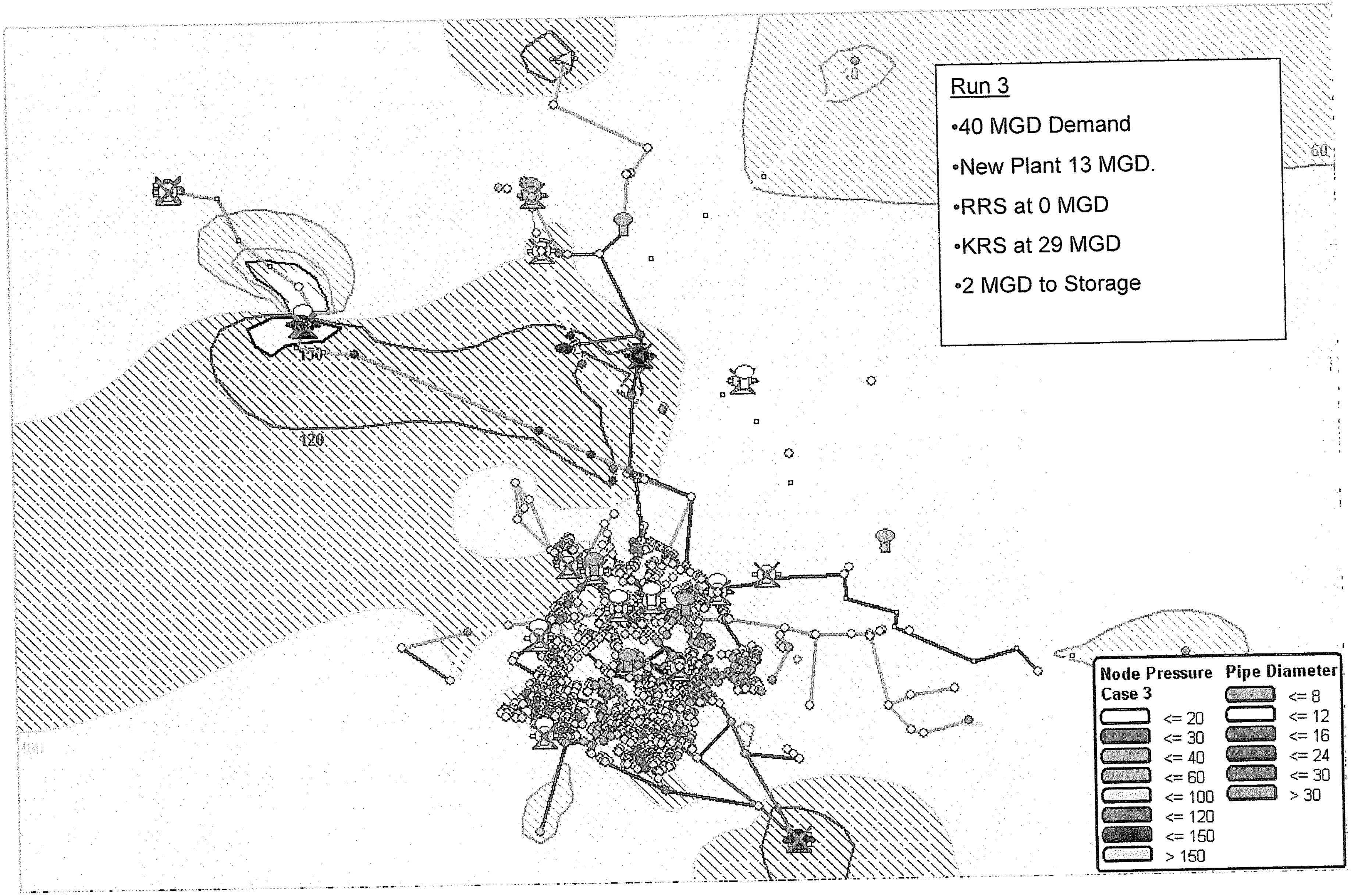

Pressure on Existing System Avg Day w/o New Plant



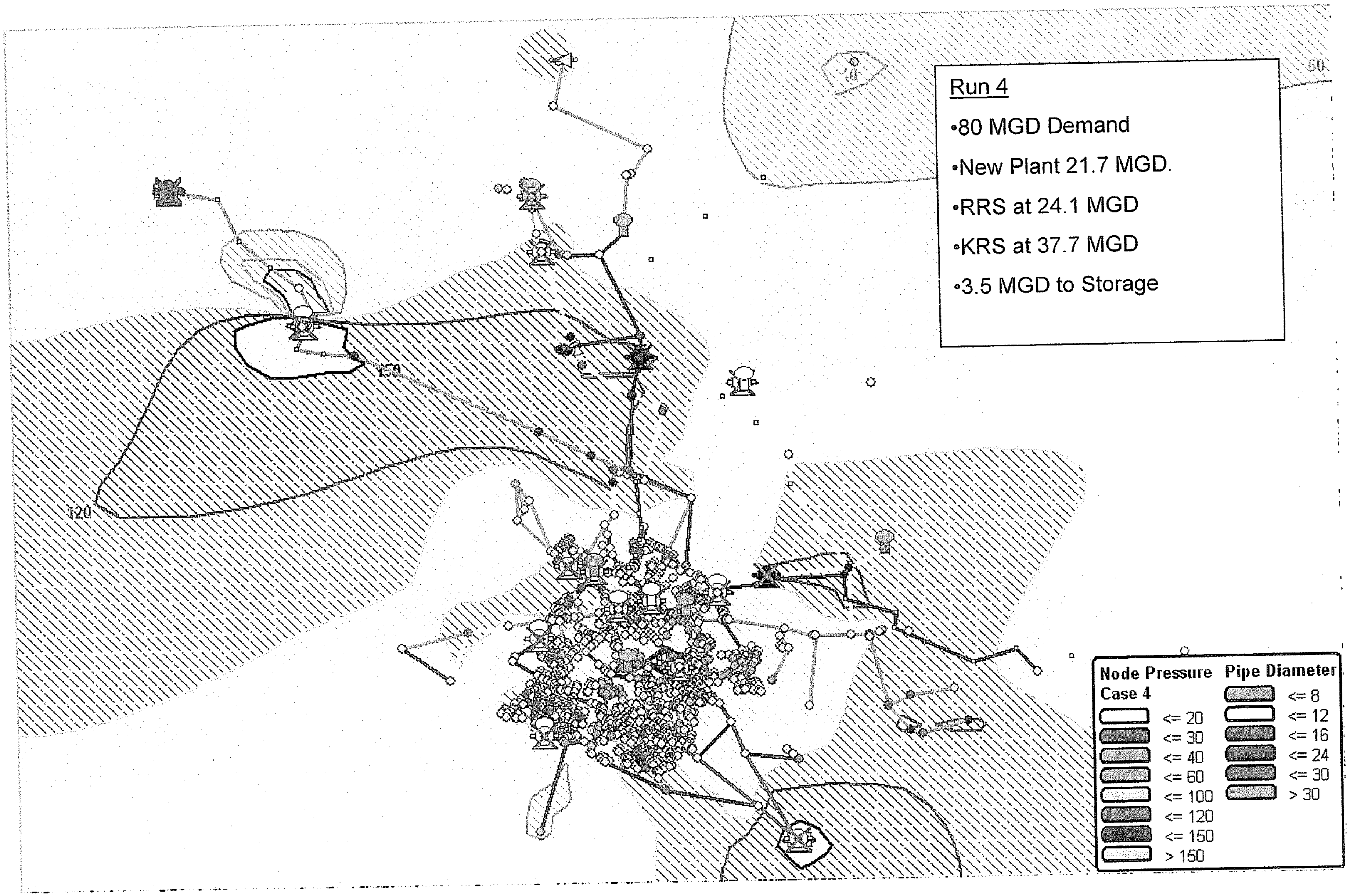

Pressure on Existing System Max Day w/o New Plant



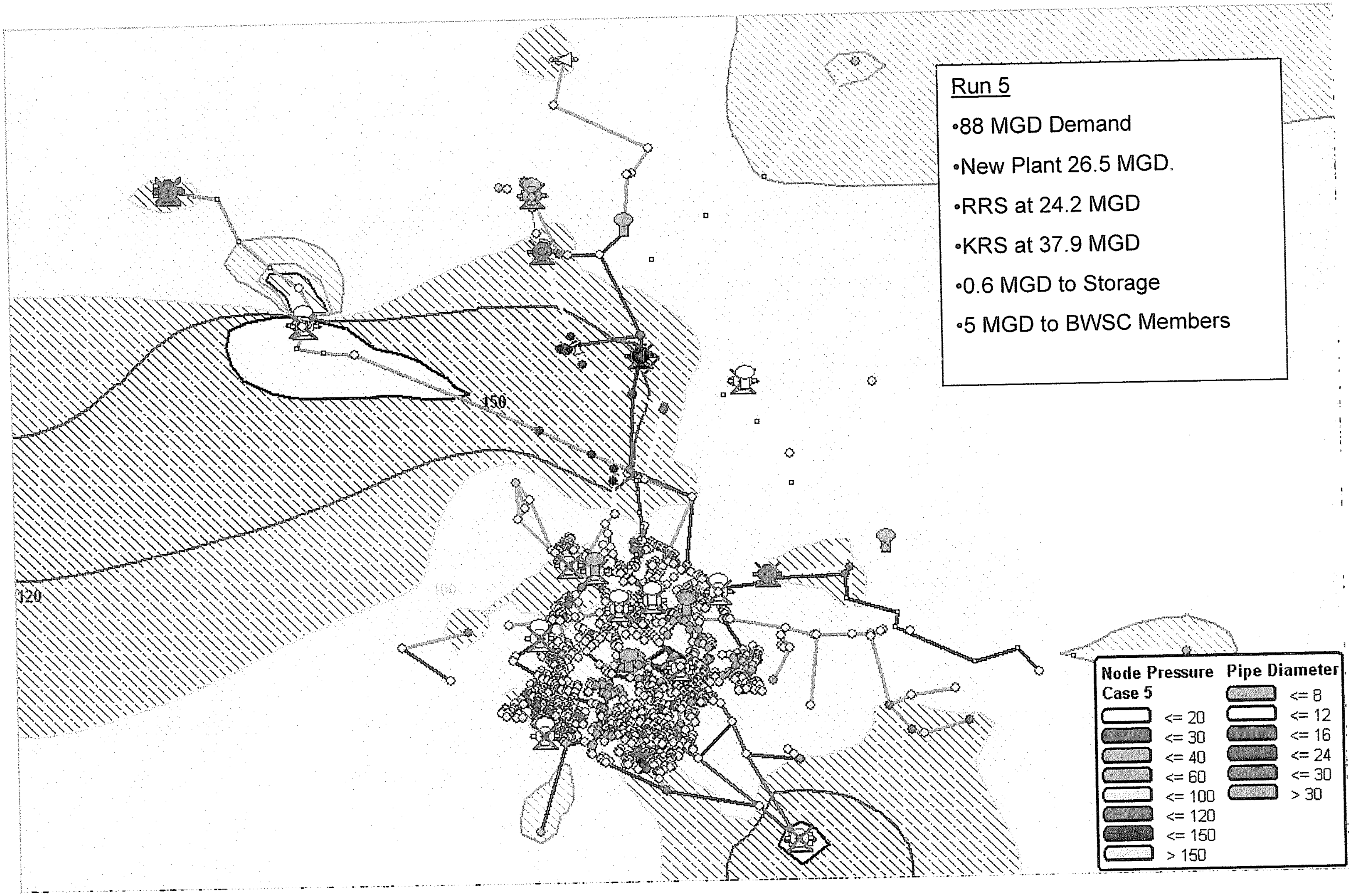

Pressure on System at 6 MGD from New Plant



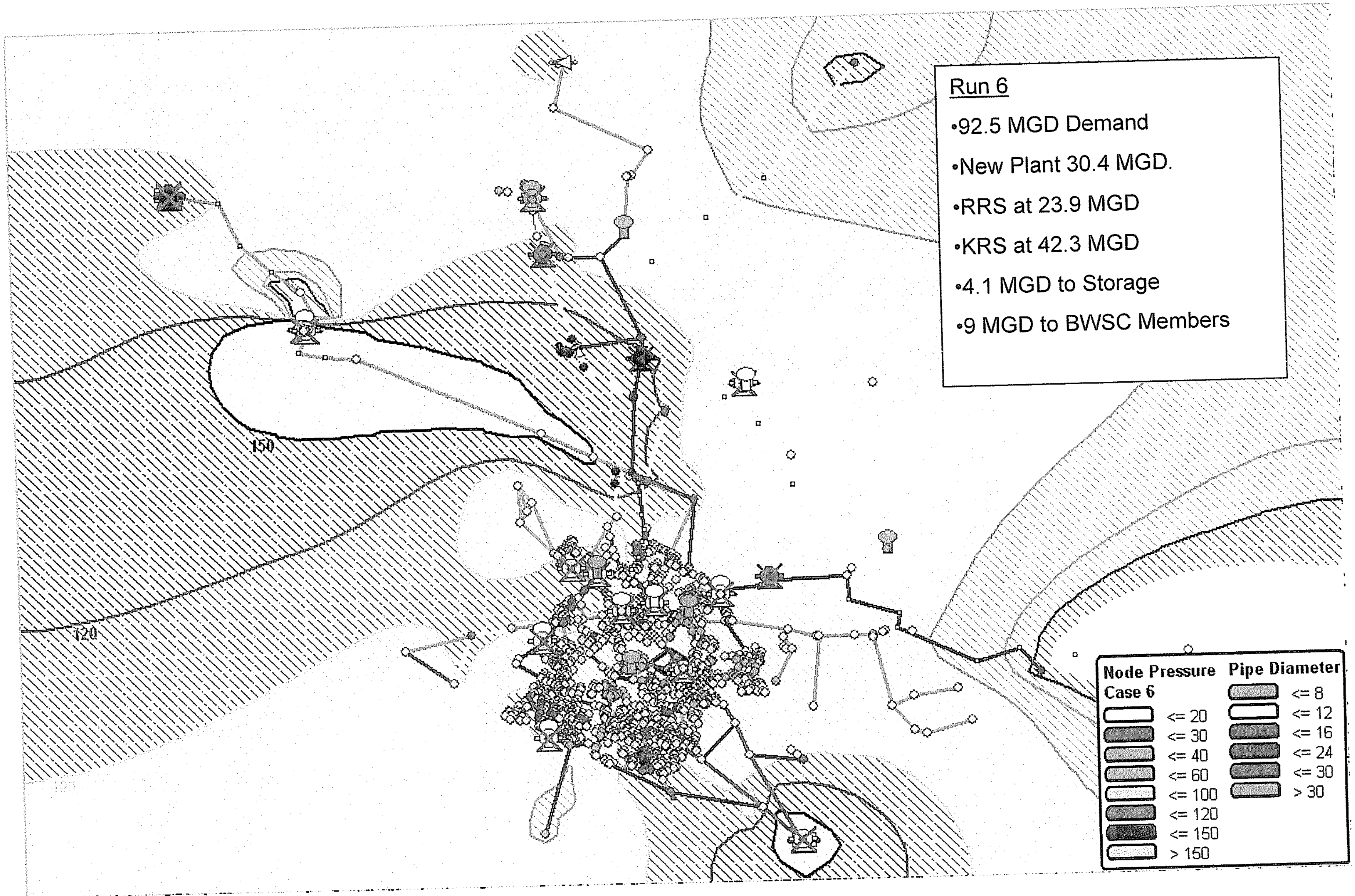

Pressure on System at 13 MGD from New Plant




Pressure on System at 20 MGD from New Plant




Pressure on System at 25 MGD from New Plant




Pressure on System at 30 MGD from New Plant

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**Witness: Linda Bridwell/Richard Svindland**

11. Refer to Kentucky-American's Application, Exhibit D. The proposed route of the transmission main from the proposed booster station to the connection with existing Kentucky-American facilities follows Route 1262 south and then east along US Highway 460 to the intersection of US Highway 460 and State Route 3378.

    a. State whether Kentucky-American considered routing the transmission main cross country from the proposed booster station to State Route 3378 and then along State Route 3378 south to US Highway 460. Explain.

    b. Describe the advantages and disadvantages of using the proposed route from the booster station to US Highway 460.

    c. State the cost of the segment of the proposed transmission main from the proposed booster station to the intersection of US Highway 460 and State Route 3378.

    d. Describe the advantages and disadvantages of using the cross-country route described in Item 11(a) above.

    e. State the cost of the segment of the proposed transmission main from the proposed booster station to the intersection of intersection of US Highway 460 and State Route 3378 if the cross-country route described in Item 11(a) above is used.

**Response:**

a. There are an infinite number of options to consider when connecting two points, all options were not considered.

b. The advantages of using the proposed route from the booster pump station to the US Highway 460 include:

    (1) avoiding the line of depression contours (sink holes) running in a southeasterly direction from the booster station to the intersection of US Highway 460 and State Route 3378
    (2) avoiding elevations extremes, low elevation of 730 and intermediate high point of 890. The main at booster station is at elevation 856, and the main at the

intersection of US Highway 460 and State Route 3378 is at elevation 834.

(3) minimize the lengths of restrained joint pipe required to overcome the elevation extremes,
(4) avoiding an additional, if not multiple crossing of the electrical transmission lines,
(5) paralleling the existing Highway right-of-way, providing easy access for construction and future operations and maintenance,
(6) any easement acquisitions would be parallel and adjacent to roadways or Buck Run,
(7) Each alternative intersects four (4) streams.

The disadvantages of using the proposed route from the booster pump station to the US Highway 460 include:

(1) The route may be 3,200 feet greater in distance,
(2) Each alternative intersects four (4) streams.

c. KAW is using an estimate of $300 per linear foot for the 42" transmission main. Under that estimate, the cost of the segment of the proposed transmission main from the proposed booster station to the intersection of US Highway 460 and State Route 3378 would be $5,070,000.

d. The advantages of using the cross-country route from the booster pump station to the US Highway 460 include:

(1) the route may be 3,200 feet shorter in distance,
(2) each alternative intersects four (4) streams.

The disadvantages of using the cross-country route from the booster pump station to the US Highway 460 include:

(1) construction of a 42" transmission main through the line of depression contours (sink holes) running in a southeasterly direction from the booster station to the intersection of US Highway 460 and State Route 3378 would add additional cost to the construction of the project and introduce a long term maintenance liability.
(2) elevations extremes, low elevation of 730 and intermediate high point of 890, The main at booster station is at elevation 856, and the main at the intersection of US Highway 460 and State Route 3378 is at elevation 834.
(3) increased lengths of restrained joint pipe will be required to overcome the elevation extremes,
(4) an additional, if not multiple crossing of the electrical transmission lines,
(5) construction of a transmission main not paralleling the existing Highway right-of-way, will complicate access for construction and future operations and maintenance,
(6) any easement acquisitions subdividing parcels may not as desirable as easement acquisitions adjacent to roadways,
(7) Each alternative intersects four (4) streams.

e. Based on the $300 per linear foot estimate, the cross-country route would initially appear to have a $960,000 cost savings, but this initial cost saving will likely result in added expense when manipulating the depression contours, elevation extremes, restrained joint pipe, and existing electrical transmission lines.

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**Witness: Richard C. Svindland**

12. At page 5 of his testimony, Richard C. Svindland states: "By the first week of April [2006], KAW had aerial PVA maps for all of Southern Owen County and Northern Franklin County. . . . An option for the intake property was obtained in June 2006, the option for the WTP [water treatment plant] site was obtained in August 2006 and an option for an intermediate booster station was obtained in October 2006."

    a. Provide a map showing the complete boundaries for the options for the intake property and the water treatment plant property, all adjacent properties and their owner's names and addresses, as well as the Franklin-Owen County boundary, with the August 2006 aerial photography as a background.

    b. (1) State whether Owen County has a planning and zoning commission.

       (2) If yes, identify each Owen County planning and zoning regulation that relates to the construction of the proposed water treatment plant and state the current status of Kentucky-American's efforts to comply with that regulation.

    c. Provide a map showing the complete property boundaries for the intermediate booster station, with adjacent parcels and their owner names and addresses, with the August 2006 aerial photography as a background.

    d. (1) State whether Franklin County has a planning and zoning commission.

       (2) If yes, identify each Franklin County planning and zoning regulation that relates to the construction of the proposed booster station or proposed intake facility and state the current status of Kentucky-American's efforts to comply with that regulation.

**Response:**

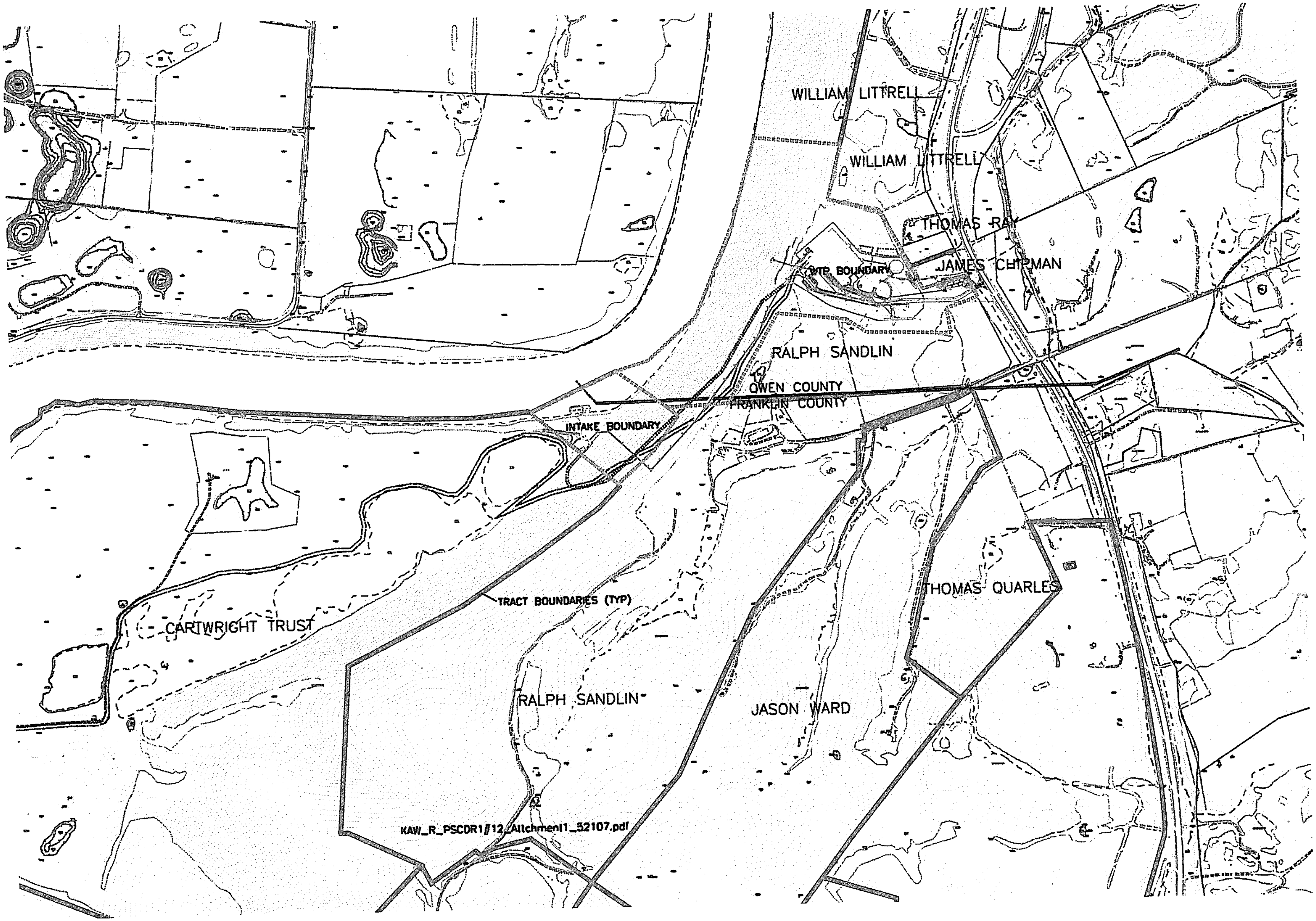
a. A map showing the optioned intake and WTP properties, the Owen - Franklin County line and the surrounding property owner's names is attached.

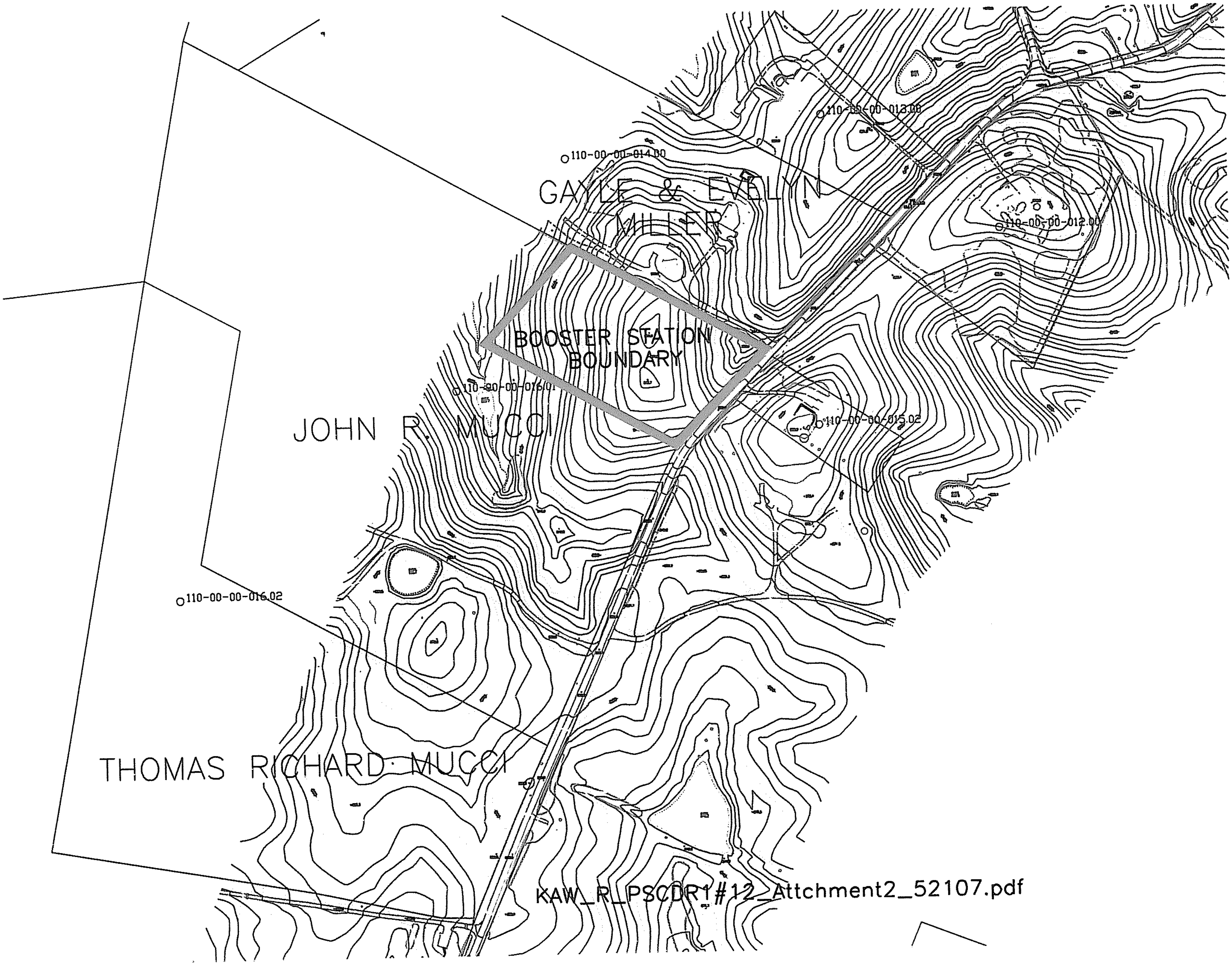
b. (1) Owen County does not have a planning and zoning commission.

c. A map showing the optioned intermediate booster station property and the surrounding property owner's names is attached.

d. (1) Franklin County does have planning and zoning commission.

(2) KAW, as a public utility regulated by the Public Service Commission, is exempt from planning and zoning regulation per KRS 100.324 for structures used in the production of water Both structures located in Franklin County are non-occupied pump stations. KAW has discussed this with the Franklin County Planning Commission and Franklin concurred. KAW did agree to submit copies of all plans and specification to Franklin County as a courtesy.


WILLIAM LITTRELL
WILLIAM LITTRELL
THOMAS RAY
JAMES CHIPMAN
WTP BOUNDARY
RALPH SANDLIN
OWEN COUNTY
FRANKLIN COUNTY
INTAKE BOUNDARY
TRACT BOUNDARIES (TYP)
CARTWRIGHT TRUST
RALPH SANDLIN
JASON WARD
THOMAS QUARLES
KAW_R_PSCDR1#12_Attchment1_52107.pdf

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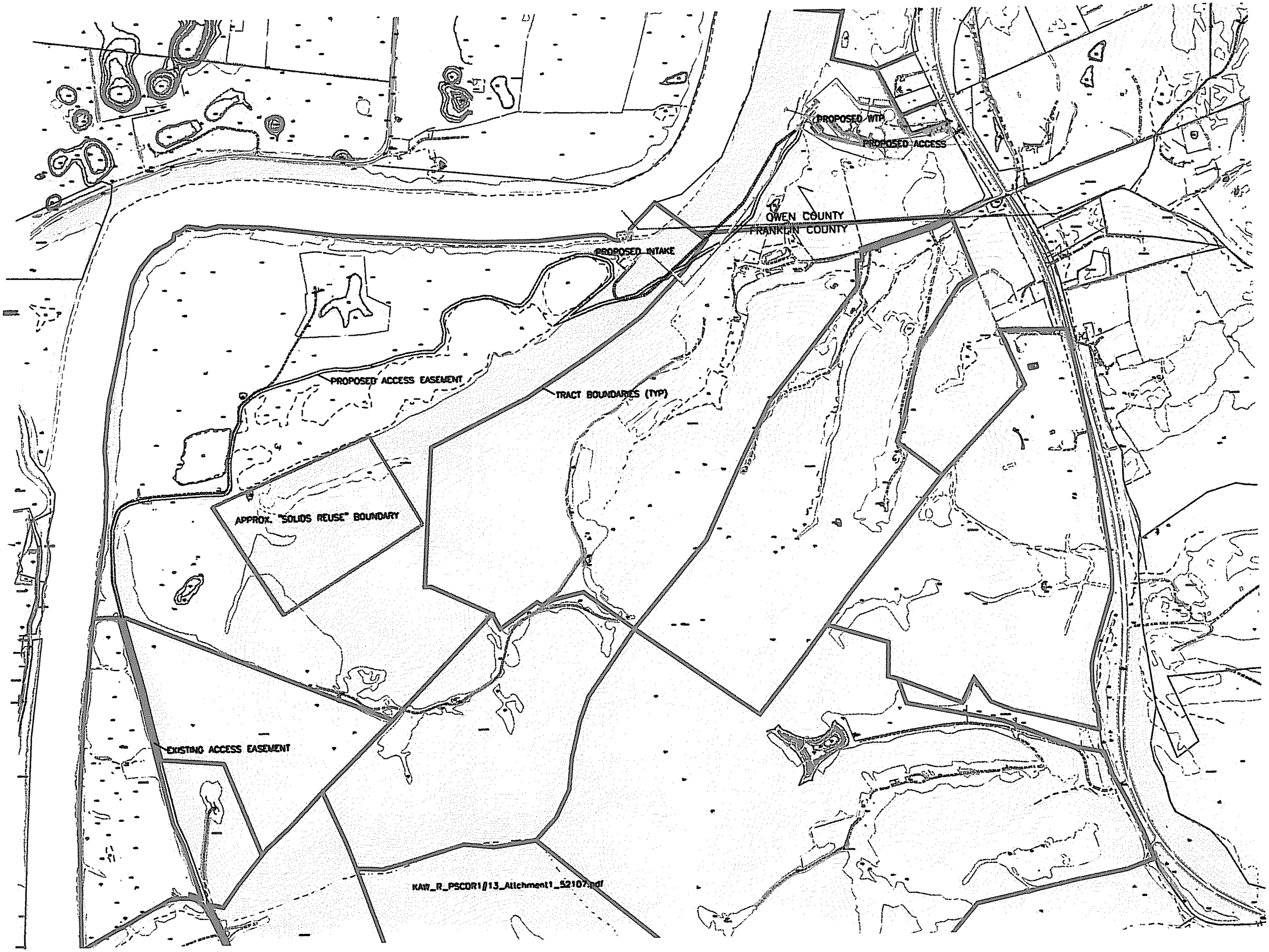
**Witness: Linda C. Bridwell/Richard C. Svindland**

13. State whether land on the optioned property for the proposed water treatment plant and intake facility will be available for "solids reuse." If yes, provide a map of these properties outlining those areas available to be used for "solids reuse," tract boundaries, existing and proposed roads and driveways, and the proposed water treatment plant and intake facilities.

**Response:**

The land on the optioned property for the intake facility will be available for "solids reuse." See attached map.

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**Witness: Linda C. Bridwell/Richard C. Svindland**

14. Refer to Direct Testimony of Richard C. Svindland at 14. State why Kentucky-American is not seeking permits for the property for "solids reuse" until the construction phase of the project.

**Response:**

After further review of the permit process since the testimony was filed in this case, KAW has decided to seek the permit for the beneficial re-use of solids from the plant during the plant approval process in 2007.

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**Witness: Richard C. Svindland**

15. a. State the number of tons of dewatered solids that will be generated for disposal per week when the proposed water treatment plant is operating at:

(1) 6 MGD;
(2) 20 MGD.

b. State the annual cost for disposal of dewatered solids off-site if the proposed water treatment plant is operating at full capacity.

c. State the annual cost for disposal of dewatered solids on-site if the proposed water treatment plant is operating at full capacity.

**Response:**

a. The estimated tons of dewatered solids at average expected river turbidities and a flow of 6 MGD is 93.7 tons per week. At 20 MGD the estimated tons of dewatered solids at average expected river turbidities is 312 tons per week

b. Assuming $30 / ton tipping fee, a transportation cost of $2.00 / mile, a 200 mile trip, and a truck capacity of 32 tons per trip, the annual cost of disposal for dewatered solids (20% solids) off-site at a landfill is estimated at $486,700 for tipping fees and $202,800 for transportation fees. Total estimate fee annual cost is $689,500.

c. Assuming KAW utilizes an existing dump truck capable of 8 tons per trip and transports dewatered solids to land it optioned at a round trip distance of 10.5 miles and an equivalent cost of $2.00 / mile, the annual cost is estimated to be $42,600.

**Witness: Richard C. Svindland**

16. Refer to Direct Testimony of Richard C. Svindland at 8-9. For each of the criteria that Mr. Svindland sets forth in his direct testimony, explain how the proposed locations for the water treatment plant and raw water intake facility meet the selection criteria.

**Response:**

To assist with the response, there were 9 selection criteria listed in my testimony. Although they were not numbered, for this response assume they are numbered 1 through 9 from top to bottom. Listed below is the response for each selection criteria.

1. The criteria is met because the intakes screen are located in a portion of pool 3 that is deep enough to allow the intake screens to be at least 6 feet below the upper sill elevation of lock 3 thus allowing barge traffic. The intake is 5.3 miles upstream of lock and dam 3 and thus will not interfere with any future dam improvement projects planned by the Kentucky River Authority.

2. The intake is located in an area of suitable hydraulics because it is located in an area where sand bars and debris should not deposit in front of or around the intake due to its location on the outside of the next river curve. The intake's location should also insure that sand and debris will not be driven directly into the intake since it is located prior to the beginning of the curve in the river.

3. The criteria is met because the intake and raw water pump is accessible via McDonalds Ferry Road and a private access easements. McDonalds Ferry Road is a paved county maintained road and the private access easement is a 12'foot wide gravel road capable of supporting construction traffic if maintained.

4. McDonalds Ferry Road and a portion of the private access easement will be flooded during 100yr flood event, thus preventing access to the intake from that road. A "Gator"[1] road from the water treatment plant (WTP) site directly to the intake is provided to allow light equipment and personnel access to the raw water pump station from land during a 100yr or 500 yr flood event.

[1] "Gator" is used here to reference a John Deere all terrain vehicle that would be capable of navigating the narrow and steep access road.

5. The elevation of the land optioned for the water treatment plant site varies from elevation 710 feet to 810 feet MSL with a majority of the land around elevation 750. The elevation of the main operating floor of the water treatment plant is 760.67 and the clearwell overflow elevation is 741.00.

6. The plant is located directly of US Hwy 127, a major north south corridor between Owenton and Frankfort. A 1200 foot long driveway will run from US Hwy 127 to the upper back portion of the water treatment plant. US Hwy 127 was recently improved by the KY Transportation Cabinet and features two 12-wide lanes and 2 twelve foot wide shoulders. The road can accommodate all expected construction traffic and chemical tanker truck deliveries.

7. The site optioned for the intermediate pump station is at elevation 880. More importantly the overflow elevation of the tank proposed at that location is elevation 910 which meets the criteria of being above elevation 900.

8. During site selection, representatives from Owen Electric Company (OEC) and Kentucky Utilities (KU) were contacted to determine the proximity of their respective services. OEC indicated they could easily serve the project by extending three phase service from the area of US127 and SR 607. KU indicated that would need to bring power from over 5 miles south from the project site.

9. Over 50 acres of land was optioned for solids reuse. The optioned land is 5.25 miles away from the WTP using existing roads. In the future, a direct road from the plant to the optioned site could be built if proven to be economical. The distance would be approximately 1 mile.

---

**Witness: Richard C. Svindland**

17. Refer to Direct Testimony of Richard C. Svindland at 10. The raw water intake land value is $3,500 per acre, the treatment plant land value is $13,500 per acre, and the booster pump station land is $21,250 per acre. Explain the wide ranges in the cost of land on a per acre basis.

**<u>Response</u>:**

The raw water intake land is located entirely in the flood plain and $3,500 per acre was the cost negotiated with the property owner. The water treatment plant land is located across the street from a 20+ acre tract that sold for over $10,000 / acre during our property negotiations. $13,500 per acre was the cost negotiated with the property owner. The booster pump station property is located 12 miles to the east of the WTP property and is much closer to Frankfort and Lexington. The $21,250 cost per acre was the cost negotiated with the property owner.

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**Witness:** Richard C. Svindland

18. Refer to Direct Testimony of Richard C. Svindland at 11. List and describe the advantages that newer technologies have over the technology that Kentucky-American selected for use at the proposed water treatment plant.

**Response:**

There are three main reasons that newer technologies are used in the water industry. One is to reduce man-power needs, the second is to reduce cost and the final reason is to meet regulations.

With the above items in mind, and to the best of my knowledge, there is no advantage that any newer technology would have over the technology selected for the new plant.

---

**Witness:** **Linda C. Bridwell**

19. Refer to Direct Testimony of Linda Bridwell at 22.

    a. Provide all studies, analyses, reports, and estimates that Kentucky-American, any Kentucky-American affiliated entity, or person retained or commissioned by Kentucky-American has prepared since March 1, 2004, on the cost of constructing a pipeline to the Louisville Water Company.

    b. If no updates have been made to the study in which Kentucky-American participated and which the BWSC issued in February 2004, provide an updated estimate of the costs to construct a pipeline to the Louisville Water Company and compare the updated costs to those of constructing the 20 MGD treatment facility on the Kentucky River at Pool 3. Provide all workpapers, show all calculations, and state all assumptions used to develop the updated costs.

**Response:**

a) Please refer to the response to Item 6 of this same data request.

b) Please refer to the response to Item 6 of this same data request.

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**Witness:** Richard C. Svindland

20. a. Provide a comparison of the capital costs of the ACTIFLO® system to the flocculation process currently proposed. Provide all workpapers, show all calculations, and state all assumptions that Kentucky-American used to develop the comparison.

    b. Provide a comparison of the operational and maintenance costs of the ACTIFLO® system to the flocculation process currently proposed. Provide all workpapers, show all calculations and state all assumptions that Kentucky-American used to develop the comparison.

    c. State whether the ACTIFLO® treatment process requires a one-year pilot study. Explain.

    d. State whether Kentucky-American considered membrane technology as an alternative for the filtration part of the treatment process. If yes, explain why Kentucky-American did not select this technology.

    e. State whether Kentucky-American considered riverbank filtration as an alternative for the filtration part of the treatment process. If yes, explain why Kentucky-American did not select this technology.

**Response:**

a. The capital cost comparison of the ACTIFLO® process to the proposed process is attached in a spreadsheet. The only assumption made is that the Commonwealth requires 30 minutes of detention time after the ACTIFLO® process. A cost for the concrete tank was included. As shown the difference in capital cost at the 30% design portion of the project was estimated to be less than $130,000

b. There are two main differences in O&M cost between the two processes, chemical feed and power costs. The spreadsheet attached in response "a" is the comparison of electrical costs only. Power costs were assumed to be Kentucky Utilities General Service Rate. The expected savings in power cost alone is approx. $37,000 per year. Because ACTIFLO® process consumes more polymer and sand than the selected process we have assumed that the estimated annual savings will be even higher resulting in a payback of around 3 years.

c. The ACTIFLO® treatment process requires a one-year pilot study in the Commonwealth of Kentucky because the there are sufficient installations across the state such that the Drinking Water Branch of the Division of Water is comfortable with their performance.

d. Please refer to exhibit D of my direct testimony. That document indicates the reasons why KAW did not choose to consider membrane technologies.

e. Kentucky-American never considered riverbank filtration as an alternative for the filtration part of the treatment process. In the United States, riverbank infiltration technology is used as a part of the pre-treatment process. It is only effective in sandy soils that will not plug or foul over time. The soil conditions along pool 3 in the vicinity of our treatment plant location were not sandy enough for riverbank infiltration.

## Cost of Actiflo

| Spec Section | Item Description | Units | Material Cost | Labor Cost | Total Unit Cost | Quantity | Total Item Cost | Total Process Cost |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| 11 | Actiflo Process Equipment | Ea Basin | $500,000 | $175,000 | $675,000 | 4 | $2,700,000 | |
| 11 | Sample pump - MW, CSWS | Ea | $1,500 | $500 | $2,000 | 2 | $4,000 | |
| | | | | | | | | **$2,704,000** |
| | | | | | | | | |
| 3 | Cast in Place Concrete - Contact Tank | CY | | | $600 | 622 | $373,200 | |
| 3 | Cast in Place Concrete - Actiflo Tank | CY | | | $600 | 978 | $586,800 | |
| | | | | | | | | **$960,000** |
| | | | | | | | | |
| 6 | Motor Control Center | ea | $60,000 | $10,000 | $70,000 | 4 | $280,000 | |
| | | | | | | | | **$280,000** |
| | | | | | | | | **$3,944,000** |

## Cost of Plates

| Spec Section | Item Description | Units | Material Cost | Labor Cost | Total Unit Cost | Quantity | Total Item Cost | Total Process Cost |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
| 11 | Plate settler and vacuum sludge removal equip. | Ea Basin | $357,500 | $107,250 | $464,750 | 4 | $1,859,000 | |
| 11 | Rapid mixer | Ea | $80,000 | $15,000 | $95,000 | 2 | $190,000 | |
| 11 | Sample pump - MW, CSWS | Ea | $1,500 | $500 | $2,000 | 2 | $4,000 | |
| 11 | Flocculation equipment | Ea Basin | $90,000 | $27,000 | $117,000 | 4 | $468,000 | |
| | | | | | | | | **$2,521,000** |
| | | | | | | | | |
| 3 | Cast in Place Concrete - Rapid mixing | CY | | | $600 | 36 | $21,458 | |
| 3 | Cast in Place Concrete - Flocculation | CY | | | $600 | 1391 | $834,600 | |
| 3 | Cast in Place Concrete - Clarification | CY | | | $600 | 639 | $383,400 | |
| | | | | | | | | **$1,239,458** |
| | | | | | | | | |
| 16 | Motor Control Center | ea | $60,000 | $10,000 | $70,000 | 3 | $210,000 | |
| | | | | | | | | **$210,000** |
| | | | | | | | | **$3,970,458** |

Difference vs Actiflo $26,458

## Power Cost for Plate Settlers

| Load No. | Description | No. of phase | Volts | Hp | Watts | Amps | KW |
|---|---|---|---|---|---|---|---|
| 1 | Rapid Mix 1 | 3 | 480 | 20.0 | 15,963 | 20 | 16.0 |
| 2 | Rapid Mix 2 | 3 | 480 | 20.0 | 15,963 | 20 | 16.0 |
| 3 | Flocculators 1 | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 4 | Flocculators 1b | 3 | 480 | 2.0 | 1,596 | 2 | 1.6 |
| 5 | Flocculators 2 | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 6 | Flocculators 2b | 3 | 480 | 2.0 | 1,596 | 2 | 1.6 |
| 7 | Flocculators 3 | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 8 | Flocculators 3b | 3 | 480 | 2.0 | 1,596 | 2 | 1.6 |
| 9 | Flocculators 4 | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 10 | Flocculators 4b | 3 | 480 | 2.0 | 1,596 | 2 | 1.6 |
| 11 | Clarifier 1 Sludge Collector | 3 | 480 | 0.3 | 798 | 1 | 0.8 |
| 12 | Clarifier 1b Sludge Collector | 3 | 480 | 0.3 | 798 | 1 | 0.8 |
| 13 | Clarifier 2 Sludge Collector | 3 | 480 | 0.3 | 798 | 1 | 0.8 |
| 14 | Clarifier 2b Sludge Collector | 3 | 480 | 0.3 | 798 | 1 | 0.8 |
| 15 | Clarifier 3 Sludge Collector | 3 | 480 | 0.3 | 798 | 1 | 0.8 |
| 16 | Clarifier 3b Sludge Collector | 3 | 480 | 0.3 | 798 | 1 | 0.8 |
| 17 | Clarifier 4 Sludge Collector | 3 | 480 | 0.3 | 798 | 1 | 0.8 |
| 18 | Clarifier 4b Sludge Collector | 3 | 480 | 0.3 | 798 | 1 | 0.8 |
| | | | | 70.0 | 28,733 | | 28.7 |

| Rate Name | Cost Per Month | Annual Cost |
|---|---|---|
| KU General Service | $ 1,118.53 | $ 13,422.31 |

## Power Cost for Actiflo

| Load No. | Description | No. of phase | Volts | Hp | Watts | Amps | KW |
|---|---|---|---|---|---|---|---|
| 1 | Coagulation Tank Mixer | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 2 | Injection Tank Mixer | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 3 | Maturation Tank Mixer | 3 | 480 | 7.5 | 6,385 | 8 | 6.4 |
| 4 | Scraper Motor | 3 | 480 | 0.5 | 798 | 1 | 0.8 |
| 5 | Sand Recirculation Pump | 3 | 480 | 15.0 | 11,972 | 15 | 12.0 |
| 6 | Coagulation Tank Mixer | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 7 | Injection Tank Mixer | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 8 | Maturation Tank Mixer | 3 | 480 | 7.5 | 6,385 | 8 | 6.4 |
| 9 | Scraper Motor | 3 | 480 | 0.5 | 798 | 1 | 0.8 |
| 10 | Sand Recirculation Pump | 3 | 480 | 15.0 | 11,972 | 15 | 12.0 |
| 11 | Coagulation Tank Mixer | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 12 | Injection Tank Mixer | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 13 | Maturation Tank Mixer | 3 | 480 | 7.5 | 6,385 | 8 | 6.4 |
| 14 | Scraper Motor | 3 | 480 | 0.5 | 798 | 1 | 0.8 |
| 15 | Sand Recirculation Pump | 3 | 480 | 15.0 | 11,972 | 15 | 12.0 |
| 16 | Coagulation Tank Mixer | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 17 | Injection Tank Mixer | 3 | 480 | 5.0 | 3,991 | 5 | 4.0 |
| 18 | Maturation Tank Mixer | 3 | 480 | 7.5 | 6,385 | 8 | 6.4 |
| 19 | Scraper Motor | 3 | 480 | 0.5 | 798 | 1 | 0.8 |
| 20 | Sand Recirculation Pump | 3 | 480 | 15.0 | 11,972 | 15 | 12.0 |
| | | | | 132.0 | 108,546 | | 108.5 |

| Rate Name | Cost Per Month | Annual Cost |
|---|---|---|
| KU General Service | $ 4,199.15 | $ 50,389.85 |

Annual Savings of Selected Process vs. Actiflo **$ 36,967.54**

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**Witness:** **Linda C. Bridwell**

21. Refer to Direct Testimony of Linda Bridwell at 13. Provide a schedule comparing the daily flow of the Kentucky River in Pool 9 and Pool 3 during the 1999 drought.

**Response:**

There is not a gage for water flow at Pool 3, however there is one at Pool 2 and Pool 4. Please see the attached file.

| KY River Data at Lock 10 | | | | KY River Data at Lock 4 | | | |
|---|---|---|---|---|---|---|---|
| Agency | Site No | Date | Flow at 10 (cfs) | Agency | Site No | Date | Flow at 4 (cfs) |
| USGS | 3284000 | 6/1/1999 | 537 | USGS | 3287500 | 6/1/1999 | 672 |
| USGS | 3284000 | 6/2/1999 | 488 | USGS | 3287500 | 6/2/1999 | 321 |
| USGS | 3284000 | 6/3/1999 | 456 | USGS | 3287500 | 6/3/1999 | 370 |
| USGS | 3284000 | 6/4/1999 | 446 | USGS | 3287500 | 6/4/1999 | 434 |
| USGS | 3284000 | 6/5/1999 | 479 | USGS | 3287500 | 6/5/1999 | 433 |
| USGS | 3284000 | 6/6/1999 | 510 | USGS | 3287500 | 6/6/1999 | 440 |
| USGS | 3284000 | 6/7/1999 | 494 | USGS | 3287500 | 6/7/1999 | 479 |
| USGS | 3284000 | 6/8/1999 | 451 | USGS | 3287500 | 6/8/1999 | 641 |
| USGS | 3284000 | 6/9/1999 | 416 | USGS | 3287500 | 6/9/1999 | 324 |
| USGS | 3284000 | 6/10/1999 | 378 | USGS | 3287500 | 6/10/1999 | 340 |
| USGS | 3284000 | 6/11/1999 | 365 | USGS | 3287500 | 6/11/1999 | 443 |
| USGS | 3284000 | 6/12/1999 | 346 | USGS | 3287500 | 6/12/1999 | 434 |
| USGS | 3284000 | 6/13/1999 | 338 | USGS | 3287500 | 6/13/1999 | 429 |
| USGS | 3284000 | 6/14/1999 | 383 | USGS | 3287500 | 6/14/1999 | 485 |
| USGS | 3284000 | 6/15/1999 | 406 | USGS | 3287500 | 6/15/1999 | 482 |
| USGS | 3284000 | 6/16/1999 | 427 | USGS | 3287500 | 6/16/1999 | 429 |
| USGS | 3284000 | 6/17/1999 | 455 | USGS | 3287500 | 6/17/1999 | 413 |
| USGS | 3284000 | 6/18/1999 | 423 | USGS | 3287500 | 6/18/1999 | 412 |
| USGS | 3284000 | 6/19/1999 | 371 | USGS | 3287500 | 6/19/1999 | 423 |
| USGS | 3284000 | 6/20/1999 | 332 | USGS | 3287500 | 6/20/1999 | 388 |
| USGS | 3284000 | 6/21/1999 | 304 | USGS | 3287500 | 6/21/1999 | 342 |
| USGS | 3284000 | 6/22/1999 | 282 | USGS | 3287500 | 6/22/1999 | 298 |
| USGS | 3284000 | 6/23/1999 | 257 | USGS | 3287500 | 6/23/1999 | 264 |
| USGS | 3284000 | 6/24/1999 | 258 | USGS | 3287500 | 6/24/1999 | 284 |
| USGS | 3284000 | 6/25/1999 | 261 | USGS | 3287500 | 6/25/1999 | 304 |
| USGS | 3284000 | 6/26/1999 | 236 | USGS | 3287500 | 6/26/1999 | 333 |
| USGS | 3284000 | 6/27/1999 | 225 | USGS | 3287500 | 6/27/1999 | 519 |
| USGS | 3284000 | 6/28/1999 | 283 | USGS | 3287500 | 6/28/1999 | 2310 |
| USGS | 3284000 | 6/29/1999 | 480 | USGS | 3287500 | 6/29/1999 | 4190 |
| USGS | 3284000 | 6/30/1999 | 542 | USGS | 3287500 | 6/30/1999 | 1290 |
| USGS | 3284000 | 7/1/1999 | 650 | USGS | 3287500 | 7/1/1999 | 1180 |
| USGS | 3284000 | 7/2/1999 | 816 | USGS | 3287500 | 7/2/1999 | 1130 |
| USGS | 3284000 | 7/3/1999 | 682 | USGS | 3287500 | 7/3/1999 | 1600 |
| USGS | 3284000 | 7/4/1999 | 544 | USGS | 3287500 | 7/4/1999 | 1500 |
| USGS | 3284000 | 7/5/1999 | 496 | USGS | 3287500 | 7/5/1999 | 1150 |
| USGS | 3284000 | 7/6/1999 | 522 | USGS | 3287500 | 7/6/1999 | 909 |
| USGS | 3284000 | 7/7/1999 | 506 | USGS | 3287500 | 7/7/1999 | 791 |
| USGS | 3284000 | 7/8/1999 | 441 | USGS | 3287500 | 7/8/1999 | 747 |
| USGS | 3284000 | 7/9/1999 | 362 | USGS | 3287500 | 7/9/1999 | 693 |
| USGS | 3284000 | 7/10/1999 | 312 | USGS | 3287500 | 7/10/1999 | 595 |
| USGS | 3284000 | 7/11/1999 | 270 | USGS | 3287500 | 7/11/1999 | 537 |
| USGS | 3284000 | 7/12/1999 | 235 | USGS | 3287500 | 7/12/1999 | 486 |
| USGS | 3284000 | 7/13/1999 | 229 | USGS | 3287500 | 7/13/1999 | 441 |
| USGS | 3284000 | 7/14/1999 | 222 | USGS | 3287500 | 7/14/1999 | 378 |
| USGS | 3284000 | 7/15/1999 | 214 | USGS | 3287500 | 7/15/1999 | 341 |
| USGS | 3284000 | 7/16/1999 | 205 | USGS | 3287500 | 7/16/1999 | 304 |

| KY River Data at Lock 10 | | | | KY River Data at Lock 4 | | | |
|---|---|---|---|---|---|---|---|
| Agency | Site No | Date | Flow at 10 (cfs) | Agency | Site No | Date | Flow at 4 (cfs) |
| USGS | 3284000 | 7/17/1999 | 202 | USGS | 3287500 | 7/17/1999 | 294 |
| USGS | 3284000 | 7/18/1999 | 198 | USGS | 3287500 | 7/18/1999 | 286 |
| USGS | 3284000 | 7/19/1999 | 218 | USGS | 3287500 | 7/19/1999 | 273 |
| USGS | 3284000 | 7/20/1999 | 273 | USGS | 3287500 | 7/20/1999 | 270 |
| USGS | 3284000 | 7/21/1999 | 321 | USGS | 3287500 | 7/21/1999 | 297 |
| USGS | 3284000 | 7/22/1999 | 314 | USGS | 3287500 | 7/22/1999 | 388 |
| USGS | 3284000 | 7/23/1999 | 304 | USGS | 3287500 | 7/23/1999 | 463 |
| USGS | 3284000 | 7/24/1999 | 395 | USGS | 3287500 | 7/24/1999 | 479 |
| USGS | 3284000 | 7/25/1999 | 464 | USGS | 3287500 | 7/25/1999 | 453 |
| USGS | 3284000 | 7/26/1999 | 511 | USGS | 3287500 | 7/26/1999 | 512 |
| USGS | 3284000 | 7/27/1999 | 489 | USGS | 3287500 | 7/27/1999 | 635 |
| USGS | 3284000 | 7/28/1999 | 474 | USGS | 3287500 | 7/28/1999 | 708 |
| USGS | 3284000 | 7/29/1999 | 416 | USGS | 3287500 | 7/29/1999 | 724 |
| USGS | 3284000 | 7/30/1999 | 356 | USGS | 3287500 | 7/30/1999 | 644 |
| USGS | 3284000 | 7/31/1999 | 318 | USGS | 3287500 | 7/31/1999 | 575 |
| USGS | 3284000 | 8/1/1999 | 288 | USGS | 3287500 | 8/1/1999 | 508 |
| USGS | 3284000 | 8/2/1999 | 273 | USGS | 3287500 | 8/2/1999 | 473 |
| USGS | 3284000 | 8/3/1999 | 247 | USGS | 3287500 | 8/3/1999 | 424 |
| USGS | 3284000 | 8/4/1999 | 252 | USGS | 3287500 | 8/4/1999 | 388 |
| USGS | 3284000 | 8/5/1999 | 279 | USGS | 3287500 | 8/5/1999 | 349 |
| USGS | 3284000 | 8/6/1999 | 268 | USGS | 3287500 | 8/6/1999 | 311 |
| USGS | 3284000 | 8/7/1999 | 219 | USGS | 3287500 | 8/7/1999 | 317 |
| USGS | 3284000 | 8/8/1999 | 184 | USGS | 3287500 | 8/8/1999 | 353 |
| USGS | 3284000 | 8/9/1999 | 172 | USGS | 3287500 | 8/9/1999 | 349 |
| USGS | 3284000 | 8/10/1999 | 149 | USGS | 3287500 | 8/10/1999 | 305 |
| USGS | 3284000 | 8/11/1999 | 125 | USGS | 3287500 | 8/11/1999 | 278 |
| USGS | 3284000 | 8/12/1999 | 114 | USGS | 3287500 | 8/12/1999 | 253 |
| USGS | 3284000 | 8/13/1999 | 104 | USGS | 3287500 | 8/13/1999 | 237 |
| USGS | 3284000 | 8/14/1999 | 94 | USGS | 3287500 | 8/14/1999 | 232 |
| USGS | 3284000 | 8/15/1999 | 78 | USGS | 3287500 | 8/15/1999 | 226 |
| USGS | 3284000 | 8/16/1999 | 87 | USGS | 3287500 | 8/16/1999 | 231 |
| USGS | 3284000 | 8/17/1999 | 158 | USGS | 3287500 | 8/17/1999 | 208 |
| USGS | 3284000 | 8/18/1999 | 217 | USGS | 3287500 | 8/18/1999 | 202 |
| USGS | 3284000 | 8/19/1999 | 205 | USGS | 3287500 | 8/19/1999 | 198 |
| USGS | 3284000 | 8/20/1999 | 167 | USGS | 3287500 | 8/20/1999 | 184 |
| USGS | 3284000 | 8/21/1999 | 135 | USGS | 3287500 | 8/21/1999 | 190 |
| USGS | 3284000 | 8/22/1999 | 112 | USGS | 3287500 | 8/22/1999 | 191 |
| USGS | 3284000 | 8/23/1999 | 97 | USGS | 3287500 | 8/23/1999 | 196 |
| USGS | 3284000 | 8/24/1999 | 89 | USGS | 3287500 | 8/24/1999 | 215 |
| USGS | 3284000 | 8/25/1999 | 116 | USGS | 3287500 | 8/25/1999 | 237 |
| USGS | 3284000 | 8/26/1999 | 452 | USGS | 3287500 | 8/26/1999 | 213 |
| USGS | 3284000 | 8/27/1999 | 1230 | USGS | 3287500 | 8/27/1999 | 214 |
| USGS | 3284000 | 8/28/1999 | 891 | USGS | 3287500 | 8/28/1999 | 765 |
| USGS | 3284000 | 8/29/1999 | 541 | USGS | 3287500 | 8/29/1999 | 1470 |
| USGS | 3284000 | 8/30/1999 | 379 | USGS | 3287500 | 8/30/1999 | 1080 |
| USGS | 3284000 | 8/31/1999 | 308 | USGS | 3287500 | 8/31/1999 | 733 |
| USGS | 3284000 | 9/1/1999 | 258 | USGS | 3287500 | 9/1/1999 | 523 |

| KY River Data at Lock 10 | | | | KY River Data at Lock 4 | | | |
|---|---|---|---|---|---|---|---|
| Agency | Site No | Date | Flow at 10 (cfs) | Agency | Site No | Date | Flow at 4 (cfs) |
| USGS | 3284000 | 9/2/1999 | 216 | USGS | 3287500 | 9/2/1999 | 424 |
| USGS | 3284000 | 9/3/1999 | 180 | USGS | 3287500 | 9/3/1999 | 369 |
| USGS | 3284000 | 9/4/1999 | 147 | USGS | 3287500 | 9/4/1999 | 310 |
| USGS | 3284000 | 9/5/1999 | 126 | USGS | 3287500 | 9/5/1999 | 263 |
| USGS | 3284000 | 9/6/1999 | 111 | USGS | 3287500 | 9/6/1999 | 234 |
| USGS | 3284000 | 9/7/1999 | 101 | USGS | 3287500 | 9/7/1999 | 197 |
| USGS | 3284000 | 9/8/1999 | 89 | USGS | 3287500 | 9/8/1999 | 168 |
| USGS | 3284000 | 9/9/1999 | 79 | USGS | 3287500 | 9/9/1999 | 169 |
| USGS | 3284000 | 9/10/1999 | 65 | USGS | 3287500 | 9/10/1999 | 164 |
| USGS | 3284000 | 9/11/1999 | 58 | USGS | 3287500 | 9/11/1999 | 167 |
| USGS | 3284000 | 9/12/1999 | 52 | USGS | 3287500 | 9/12/1999 | 182 |
| USGS | 3284000 | 9/13/1999 | 58 | USGS | 3287500 | 9/13/1999 | 186 |
| USGS | 3284000 | 9/14/1999 | 103 | USGS | 3287500 | 9/14/1999 | 180 |
| USGS | 3284000 | 9/15/1999 | 99 | USGS | 3287500 | 9/15/1999 | 172 |
| USGS | 3284000 | 9/16/1999 | 84 | USGS | 3287500 | 9/16/1999 | 162 |
| USGS | 3284000 | 9/17/1999 | 78 | USGS | 3287500 | 9/17/1999 | 157 |
| USGS | 3284000 | 9/18/1999 | 72 | USGS | 3287500 | 9/18/1999 | 168 |
| USGS | 3284000 | 9/19/1999 | 70 | USGS | 3287500 | 9/19/1999 | 176 |
| USGS | 3284000 | 9/20/1999 | 84 | USGS | 3287500 | 9/20/1999 | 182 |
| USGS | 3284000 | 9/21/1999 | 75 | USGS | 3287500 | 9/21/1999 | 198 |
| USGS | 3284000 | 9/22/1999 | 85 | USGS | 3287500 | 9/22/1999 | 184 |
| USGS | 3284000 | 9/23/1999 | 85 | USGS | 3287500 | 9/23/1999 | 171 |
| USGS | 3284000 | 9/24/1999 | 82 | USGS | 3287500 | 9/24/1999 | 166 |
| USGS | 3284000 | 9/25/1999 | 86 | USGS | 3287500 | 9/25/1999 | 177 |
| USGS | 3284000 | 9/26/1999 | 94 | USGS | 3287500 | 9/26/1999 | 176 |
| USGS | 3284000 | 9/27/1999 | 102 | USGS | 3287500 | 9/27/1999 | 177 |
| USGS | 3284000 | 9/28/1999 | 103 | USGS | 3287500 | 9/28/1999 | 162 |
| USGS | 3284000 | 9/29/1999 | 107 | USGS | 3287500 | 9/29/1999 | 128 |
| USGS | 3284000 | 9/30/1999 | 101 | USGS | 3287500 | 9/30/1999 | 123 |
| USGS | 3284000 | 10/1/1999 | 22 | USGS | 3287500 | 10/1/1999 | 115 |
| USGS | 3284000 | 10/2/1999 | 39 | USGS | 3287500 | 10/2/1999 | 114 |
| USGS | 3284000 | 10/3/1999 | 62 | USGS | 3287500 | 10/3/1999 | 122 |
| USGS | 3284000 | 10/4/1999 | 103 | USGS | 3287500 | 10/4/1999 | 136 |
| USGS | 3284000 | 10/5/1999 | 140 | USGS | 3287500 | 10/5/1999 | 137 |
| USGS | 3284000 | 10/6/1999 | 194 | USGS | 3287500 | 10/6/1999 | 134 |
| USGS | 3284000 | 10/7/1999 | 232 | USGS | 3287500 | 10/7/1999 | 134 |
| USGS | 3284000 | 10/8/1999 | 199 | USGS | 3287500 | 10/8/1999 | 134 |
| USGS | 3284000 | 10/9/1999 | 300 | USGS | 3287500 | 10/9/1999 | 168 |
| USGS | 3284000 | 10/10/1999 | 550 | USGS | 3287500 | 10/10/1999 | 320 |
| USGS | 3284000 | 10/11/1999 | 722 | USGS | 3287500 | 10/11/1999 | 364 |
| USGS | 3284000 | 10/12/1999 | 731 | USGS | 3287500 | 10/12/1999 | 696 |
| USGS | 3284000 | 10/13/1999 | 837 | USGS | 3287500 | 10/13/1999 | 775 |
| USGS | 3284000 | 10/14/1999 | 825 | USGS | 3287500 | 10/14/1999 | 787 |
| USGS | 3284000 | 10/15/1999 | 681 | USGS | 3287500 | 10/15/1999 | 808 |
| USGS | 3284000 | 10/16/1999 | 538 | USGS | 3287500 | 10/16/1999 | 739 |
| USGS | 3284000 | 10/17/1999 | 432 | USGS | 3287500 | 10/17/1999 | 600 |
| USGS | 3284000 | 10/18/1999 | 356 | USGS | 3287500 | 10/18/1999 | 503 |

| KY River Data at Lock 10 | | | | KY River Data at Lock 4 | | | |
|---|---|---|---|---|---|---|---|
| Agency | Site No | Date | Flow at 10 (cfs) | Agency | Site No | Date | Flow at 4 (cfs) |
| USGS | 3284000 | 10/19/1999 | 298 | USGS | 3287500 | 10/19/1999 | 430 |
| USGS | 3284000 | 10/20/1999 | 237 | USGS | 3287500 | 10/20/1999 | 382 |
| USGS | 3284000 | 10/21/1999 | 204 | USGS | 3287500 | 10/21/1999 | 345 |
| USGS | 3284000 | 10/22/1999 | 170 | USGS | 3287500 | 10/22/1999 | 327 |
| USGS | 3284000 | 10/23/1999 | 146 | USGS | 3287500 | 10/23/1999 | 284 |
| USGS | 3284000 | 10/24/1999 | 137 | USGS | 3287500 | 10/24/1999 | 263 |
| USGS | 3284000 | 10/25/1999 | 129 | USGS | 3287500 | 10/25/1999 | 245 |
| USGS | 3284000 | 10/26/1999 | 123 | USGS | 3287500 | 10/26/1999 | 220 |
| USGS | 3284000 | 10/27/1999 | 121 | USGS | 3287500 | 10/27/1999 | 202 |
| USGS | 3284000 | 10/28/1999 | 120 | USGS | 3287500 | 10/28/1999 | 203 |
| USGS | 3284000 | 10/29/1999 | 120 | USGS | 3287500 | 10/29/1999 | 202 |
| USGS | 3284000 | 10/30/1999 | 116 | USGS | 3287500 | 10/30/1999 | 199 |
| USGS | 3284000 | 10/31/1999 | 113 | USGS | 3287500 | 10/31/1999 | 193 |
| USGS | 3284000 | 11/1/1999 | 112 | USGS | 3287500 | 11/1/1999 | 192 |
| USGS | 3284000 | 11/2/1999 | 192 | USGS | 3287500 | 11/2/1999 | 283 |
| USGS | 3284000 | 11/3/1999 | 566 | USGS | 3287500 | 11/3/1999 | 310 |
| USGS | 3284000 | 11/4/1999 | 815 | USGS | 3287500 | 11/4/1999 | 438 |
| USGS | 3284000 | 11/5/1999 | 729 | USGS | 3287500 | 11/5/1999 | 929 |
| USGS | 3284000 | 11/6/1999 | 635 | USGS | 3287500 | 11/6/1999 | 1180 |
| USGS | 3284000 | 11/7/1999 | 529 | USGS | 3287500 | 11/7/1999 | 1070 |
| USGS | 3284000 | 11/8/1999 | 438 | USGS | 3287500 | 11/8/1999 | 927 |
| USGS | 3284000 | 11/9/1999 | 368 | USGS | 3287500 | 11/9/1999 | 775 |
| USGS | 3284000 | 11/10/1999 | 314 | USGS | 3287500 | 11/10/1999 | 630 |
| USGS | 3284000 | 11/11/1999 | 270 | USGS | 3287500 | 11/11/1999 | 509 |
| USGS | 3284000 | 11/12/1999 | 245 | USGS | 3287500 | 11/12/1999 | 458 |
| USGS | 3284000 | 11/13/1999 | 218 | USGS | 3287500 | 11/13/1999 | 416 |
| USGS | 3284000 | 11/14/1999 | 196 | USGS | 3287500 | 11/14/1999 | 374 |
| USGS | 3284000 | 11/15/1999 | 185 | USGS | 3287500 | 11/15/1999 | 350 |
| USGS | 3284000 | 11/16/1999 | 169 | USGS | 3287500 | 11/16/1999 | 323 |
| USGS | 3284000 | 11/17/1999 | 160 | USGS | 3287500 | 11/17/1999 | 305 |
| USGS | 3284000 | 11/18/1999 | 144 | USGS | 3287500 | 11/18/1999 | 285 |
| USGS | 3284000 | 11/19/1999 | 125 | USGS | 3287500 | 11/19/1999 | 282 |
| USGS | 3284000 | 11/20/1999 | 131 | USGS | 3287500 | 11/20/1999 | 281 |
| USGS | 3284000 | 11/21/1999 | 153 | USGS | 3287500 | 11/21/1999 | 290 |
| USGS | 3284000 | 11/22/1999 | 163 | USGS | 3287500 | 11/22/1999 | 290 |
| USGS | 3284000 | 11/23/1999 | 167 | USGS | 3287500 | 11/23/1999 | 289 |
| USGS | 3284000 | 11/24/1999 | 170 | USGS | 3287500 | 11/24/1999 | 289 |
| USGS | 3284000 | 11/25/1999 | 203 | USGS | 3287500 | 11/25/1999 | 310 |
| USGS | 3284000 | 11/26/1999 | 287 | USGS | 3287500 | 11/26/1999 | 375 |
| USGS | 3284000 | 11/27/1999 | 497 | USGS | 3287500 | 11/27/1999 | 393 |
| USGS | 3284000 | 11/28/1999 | 1340 | USGS | 3287500 | 11/28/1999 | 475 |
| USGS | 3284000 | 11/29/1999 | 1800 | USGS | 3287500 | 11/29/1999 | 1260 |
| USGS | 3284000 | 11/30/1999 | 1300 | USGS | 3287500 | 11/30/1999 | 2200 |
| USGS | 3284000 | 12/1/1999 | 920 | USGS | 3287500 | 12/1/1999 | 1820 |
| USGS | 3284000 | 12/2/1999 | 712 | USGS | 3287500 | 12/2/1999 | 1720 |
| USGS | 3284000 | 12/3/1999 | 594 | USGS | 3287500 | 12/3/1999 | 1350 |
| USGS | 3284000 | 12/4/1999 | 500 | USGS | 3287500 | 12/4/1999 | 1020 |

| KY River Data at Lock 10 | | | | KY River Data at Lock 4 | | | |
|---|---|---|---|---|---|---|---|
| Agency | Site No | Date | Flow at 10 (cfs) | Agency | Site No | Date | Flow at 4 (cfs) |
| USGS | 3284000 | 12/5/1999 | 430 | USGS | 3287500 | 12/5/1999 | 861 |
| USGS | 3284000 | 12/6/1999 | 390 | USGS | 3287500 | 12/6/1999 | 713 |
| USGS | 3284000 | 12/7/1999 | 379 | USGS | 3287500 | 12/7/1999 | 628 |
| USGS | 3284000 | 12/8/1999 | 372 | USGS | 3287500 | 12/8/1999 | 594 |
| USGS | 3284000 | 12/9/1999 | 365 | USGS | 3287500 | 12/9/1999 | 560 |
| USGS | 3284000 | 12/10/1999 | 450 | USGS | 3287500 | 12/10/1999 | 649 |
| USGS | 3284000 | 12/11/1999 | 614 | USGS | 3287500 | 12/11/1999 | 755 |
| USGS | 3284000 | 12/12/1999 | 828 | USGS | 3287500 | 12/12/1999 | 988 |
| USGS | 3284000 | 12/13/1999 | 1790 | USGS | 3287500 | 12/13/1999 | 1870 |
| USGS | 3284000 | 12/14/1999 | 3730 | USGS | 3287500 | 12/14/1999 | 4650 |
| USGS | 3284000 | 12/15/1999 | 4560 | USGS | 3287500 | 12/15/1999 | 5500 |
| USGS | 3284000 | 12/16/1999 | 4480 | USGS | 3287500 | 12/16/1999 | 5700 |
| USGS | 3284000 | 12/17/1999 | 3150 | USGS | 3287500 | 12/17/1999 | 5480 |
| USGS | 3284000 | 12/18/1999 | 2180 | USGS | 3287500 | 12/18/1999 | 3890 |
| USGS | 3284000 | 12/19/1999 | 1770 | USGS | 3287500 | 12/19/1999 | 2700 |
| USGS | 3284000 | 12/20/1999 | 1560 | USGS | 3287500 | 12/20/1999 | 2190 |
| USGS | 3284000 | 12/21/1999 | 1330 | USGS | 3287500 | 12/21/1999 | 1920 |
| USGS | 3284000 | 12/22/1999 | 1170 | USGS | 3287500 | 12/22/1999 | 1710 |
| USGS | 3284000 | 12/23/1999 | 1050 | USGS | 3287500 | 12/23/1999 | 1510 |
| USGS | 3284000 | 12/24/1999 | 881 | USGS | 3287500 | 12/24/1999 | 1390 |
| USGS | 3284000 | 12/25/1999 | 749 | USGS | 3287500 | 12/25/1999 | 1230 |
| USGS | 3284000 | 12/26/1999 | 665 | USGS | 3287500 | 12/26/1999 | 1010 |
| USGS | 3284000 | 12/27/1999 | 628 | USGS | 3287500 | 12/27/1999 | 870 |
| USGS | 3284000 | 12/28/1999 | 587 | USGS | 3287500 | 12/28/1999 | 805 |
| USGS | 3284000 | 12/29/1999 | 535 | USGS | 3287500 | 12/29/1999 | 753 |
| USGS | 3284000 | 12/30/1999 | 502 | USGS | 3287500 | 12/30/1999 | 715 |
| USGS | 3284000 | 12/31/1999 | 467 | USGS | 3287500 | 12/31/1999 | 687 |

**Witness: Linda C. Bridwell**

23. Provide Kentucky-American's current projections for plant availability in terms of percentage production available for 2010, 2020, and 2030. Provide a composite number for all three plants.

**Response:**

The percent utilization will vary depending whether the plants are operating to meet an average day demand, maximum day demand or drought average day demand. Presented below are three tables indicating percent utilization under the three demand scenarios.

**Table 1 - Percent Utilization – Avg. Day**

| | | Year | | |
|---|---|---|---|---|
| | | **2010** | **2020** | **2030** |
| | Projected Avg. Demand | 42.7 | 46.6 | 49.5 |
| Plant | RRS | 43% | 49% | 49% |
| | KRS | 65% | 71% | 71% |
| | KRS II | 30% | 30% | 45% |
| | | | Composite of all Plants | 58% |

**Table 2 - Percent Utilization – Max. Day**

| | | Year | | |
|---|---|---|---|---|
| | | 2010 | 2020 | 2030 |
| | Projected Max. Day Demand | 77.7 | 80.9 | 85.6 |
| Plant | RRS | 100% | 100% | 100% |
| | KRS | 100% | 100% | 100% |
| | KRS II | 64% | 80% | 103% |
| | | | Composite of all Plants | 101% |

**Table 3 - Percent Utilization – Drought Avg. Day**

| | | Year | | |
|---|---|---|---|---|
| | | 2010 | 2020 | 2030 |
| | Projected Drought Avg. Day Demand | 54 | 59 | 62 |
| Plant | RRS | 0% | 0% | 0% |
| | KRS | 88% | 88% | 88% |
| | KRS II | 95% | 120% | 135% |
| | | | Composite of all Plants | 73% |
| | | | Composite of all Plants minus RRS | 103% |

**KENTUCKY-AMERICAN WATER COMPANY**
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**COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUEST FOR PRODUCTION OF DOCUMENTS**
**Item 24 of 34**

---

**Witness:** **Linda C. Bridwell**

24. At pages 30 and 31 of her direct testimony, Ms. Bridwell states that Kentucky-American requested its customers to restrict their water usage for four months due to the inadequate raw water supply during the drought of 1999.

    a. List the months that the water restrictions were in place.

    b. List the months in 1999 in which the drought occurred

**Response:**

a) A Water Shortage Advisory was declared on June 23, 1999. All restrictions were lifted October 25, 1999.

b) Unlike other extreme weather events, droughts occur over long time periods and have more difficult to define beginnings and endings. However, the drought of 1999 actually began in the fall of 1998 with below-average rainfall through the winter and fall. The Palmer Drought Index indicated drought conditions by early 1999 and a drought watch was listed by the Drought Monitor as early as June 15, 1999. Although rain raised river levels in October 1999, it was not until March 2000 that the Drought Monitor indicated no drought conditions for Central Kentucky.

**KENTUCKY-AMERICAN WATER COMPANY**
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**Witness: Linda C. Bridwell**

25. Refer to Direct Testimony of Linda Bridwell at 32-34.

a. State the criteria that Kentucky-American used to determine the optimal point for interconnection to its existing system.

b. Identify the other points that Kentucky-American considered for interconnection and describe how each of these points compared to the point chosen.

c. Describe how Kentucky-American determined the initial three pipeline routes.

d. List and describe the criteria that Kentucky-American used to establish the potential routes.

e. Describe how the three pipeline routes were evaluated. Provide all evaluations of the routes.

f. Provide the attendance records and meeting summaries for the four public meetings to which Ms. Bridwell refers at page 33 of her direct testimony.

g. Explain why the middle route, which has the transmission main collated along an electric transmission line corridor, is not a desirable route.

**Response:**

a. The criteria used to determine the optimal point for interconnection into our existing system included:
   a. Location at a point where the Hydraulic Grade Line is not heavily influenced by RRS or KRS.
   b. Located south of the Newtown Booster Pump Station.
   c. Located in an area suitable to BWSC members and their plans.
   d. Located in an area where minimal improvements were needed to the existing system.
   e. Located at a point where existing pipeline could handle the moderate change in pressure or flow direction.

b. The only other point considered was a more northerly point off Delaplain Road in Scott County near the Toyota Motor Manufacturing facility. This location was not the optimal location because it would have required the paralleling of over 13 miles of 24-inch main and would have required additional pumping power.

c. Once the treatment plant sites were identified, there were a limited number of variations of routes that followed existing road rights-of-way or existing utility right-of way. Once the treatment plant site itself was narrowed down, KAW looked for the most feasible routes that would be comparable in length, knowing that additional length would increase costs. KAW also looked to minimize the number of stream crossings, sensitive environmental areas, and cultural or historic resources.

d. KAW looked for routes that would follow existing road or utility rights-of-way for most of the route to provide easy access for construction and ongoing assessment and maintenance. Mr. Svindland, in conjunction with Gannett-Fleming engineers established the three proposed routes preliminarily, then began investigating the routes for any feature that might make construction infeasible.

e. First, the length of all three routes was established through mapping for cost estimating purposes. Then all three routes were reviewed extensively in the field for constructability and any potentially difficult challenges from construction perspective. The three routes were evaluated with preliminary hydraulic grade lines, with significant elevation changes to be less desirable from a technical standpoint. Additionally, all three routes were reviewed for potential environmentally sensitive areas by Gannett-Fleming Engineers, and for nearby cultural resources. In December, KAW held public and invited property owners from all three routes to determine if there were issues or concerns that could impact construction that KAW had not already identified. Then Quest Engineers, who had been retained to design the transmission line, gave KAW an opinion of a recommended route that is attached. Gannett-Fleming included an environmental investigation of the routes that is discussed in the Department of Army Section 404 permit application which is in thr response to Item 30 of this same data request. After careful consideration of all of these items, KAW determined the South route to be the optimal route and notified adjacent property owners on all three routes.

f. Please see the attached and refer to the response to Item 26 a of this same data request.

g. The electric transmission line corridor route has several disadvantages. First, the middle route has a significant number of elevation changes resulting in frequent high, then low, then high pressures again. This necessitates large air/vacuum valves and can cause significant problems from a maintenance standpoint due to surge transients along the route. Second, the additional length and fluctuation in elevations would likely require a second booster or significantly high pressures along the route. Third, as an underground facility KAW anticipates leak sounding and valve operation at least annually and the middle route has limited access from existing roads, requiring KAW to regularly cross easement property owners land for access during these monitoring efforts. There is significantly less disruption to easement property owners for underground mains even adjacent to roads for ongoing monitoring efforts. Finally, the middle route begins through a heavily wooded area which would be significantly impacted during construction, and travels extensively through the Keebler Wildlife Management Area which KAW considers an environmentally sensitive area.

# WATERLINE ROUTING OPTIONS 42" HIGH SERVICE MAINS FOR NEW WTP ON POOL 3 KENTUCKY RIVER

PREPARED FOR: Kentucky American Water

PREPARED BY: Brent A. Tippey, P.E./Quest Engineers, Inc.

DATE: February 13, 2007

## Project Overview

To address water supply deficits for Central Kentucky, Kentucky American Water (KAW) is designing a new 30 million gallon per day(MGD) water treatment plant near the Owen/Franklin County line that will withdrawal water from Kentucky River Pool 3. This location was identified based on pool characteristics as well as property availability. The 42" transmission waterline will begin at this location and terminate at the intersection of Ironworks Pike (KY 1973) and Newtown Pike (KY 922) in Fayette County. KAW has tentatively identified three possible waterline routes between these terminal points. These will be discussed in more detail in subsequent sections. The total length of line ranges from 30.1 and 32.1 miles depending on the option selected. The length of the project and the terrain of all routes require at least one booster pumping station facility be constructed. In addition, a 5 million gallon tank will be built adjacent to the booster pumping facility. The tank will have the dual role of serving as a suction well for the pumps and as a receiving tank during flushing of the transmission waterline.

The purpose of this technical memorandum is to evaluate each of the transmission waterline options based on constructability, cost and other key considerations such as environmental impact, property acquisition requirements and historical/archaeological factors.

## Potential Waterline Routes

Three potential routes have been identified that would connect the water treatment plant site with the proposed Ironworks Pike/Newtown Pike terminus point. These three routes have been identified as the "North", "Middle" and "South" routes. A brief description of each follows:

### North Route

This route begins at the WTP site near the Owen/Franklin county line along US 127. The proposed route then proceeds north along US 127 approximately 5,000 LF to Gill Branch Road, it then runs southeasterly over several unimproved roads (including Gill Branch, King and Plummers Branch) along with a short stretch of KY 897 until the route intersects KY 368 between Tacketts Mill and Elmdale. From this point, it parallels KY 368 and then diverges to follow Oakland Branch Road until its intersection with KY 227. The route then parallels KY 227 to its intersection with US 460 near Georgetown. The route then follows the Georgetown bypass around to Etter Lane where it turns south to meet up with Ironworks Pike. From this location, the route follows Ironworks Pike to the Newtown Pike intersection. The total length of this option is approximately 166,000 feet (31.4 miles).

The North Route has a number of sensitive areas that require special construction measures which will be factored into the overall cost including the following:

- Six identified cemeteries
- 7,000 LF (approximately) of waterline would be constructed within Kleber Wildlife Management Area (WMA).
- 33,000 LF of waterline construction through heavily wooded areas that have not experienced significant previous disturbance.
- 27 Stream Crossings with 57,000 LF (approximately) of waterline installed in proximity to streams.
- Significant creek crossings of Cedar Creek (north of Elmville), Elkhorn Creek (near Great Crossing), and Cane Run (Etter Lane)
- Construction around Historic Stamping Ground which would likely have numerous historical/archaeological sites.
- Crossing of Interstate 75, US 460 and US 25.
- Construction along Ironworks Pike adjacent to the Kentucky Horse Park and multiple horse farms.

The preliminary estimate of construction costs for the North route is $ 67,038,178 and is attached to this Memorandum.

**Middle Route**

This route follows the North route through Gill Branch, King Lane, KY 897 and Plummers Branch to the intersection with the Kentucky Utilities overhead powerlines. At this intersection, it leaves the North route and follows the powerline in a southeasterly direction cross-country to the powerline intersection with Snavely Road. At this point, the route follows Snavely Road to its intersection with KY 227 on the northern edge of Stamping Ground. The Middle route then follows the North route around Stamping Ground and runs along KY 227 to its intersection with Galloway Road. At this intersection, the route follows Galloway Road south to US 460. It then follows US 460 for a short distance to the intersection with Craig Lane. The route then follows Craig Lane south to the Ironworks Pike intersection. From that point, it follows the North route along Ironworks Pike across US 25, Interstate 75 and in front of the Kentucky Horse Park and other horse farms. The total length of this option is approximately 169,900 feet (32.1 miles).

The Middle Route has a number of sensitive areas that require special construction measures which will be factored into the overall cost including the following:

- Six identified cemeteries

- 14,000 LF (approximately) of waterline would be constructed within Kleber WMA.
- 47,000 LF of waterline construction through heavily wooded areas that have not experienced significant previous disturbance.
- 29 Stream Crossings with 63,000 LF (approximately) of waterline installed in proximity to streams.
- Significant creek crossings of Elkhorn Creek (near Great Crossing), and Cane Run (Galloway Road)
- Construction around Historic Stamping Ground which would likely have numerous historical/archaelogical sites.
- Crossing of Interstate 75, US 460 and US 25.
- Construction along Ironworks Pike adjacent to the Kentucky Horse Park and multiple horse farms.

The preliminary estimate of construction costs for this option is $68,584,041 and is attached to this Memorandum.

**South Route**

This route begins by going south from the WTP site along US 127 to Indian Gap Road (KY 2919). At this point it follows Indian Gap Road for a short distance before being routed over a bluff and across the Pfeiffer Fish Hatchery property. After traversing another short section of private property, the route rejoins KY 2919 until its intersection with KY 1707. Next it crosses KY 1707 and stays parallel with KY 1262 but bypasses around the community of Peaks Mill. After traversing the Peaks Mill area, the route rejoins KY 1262 and stays within the right-of-way of the road until the crossing of Elkhorn Creek near Switzer. After the crossing, the route again rejoins KY 1262 and follows it until its intersection with US 460. At the intersection, the route begins to follow US 460 and this continues until its intersection with Ironworks Pike (KY 1973). At this intersection, the route follows Ironworks Pike across US 62 to intersection points with the North and Middle Routes. From these points, the route then crosses US 25, Interstate 75 and the Kentucky Horse Park and other horse farms in a manner similar to the previous options. The total length of this option is approximately 158,500 feet (30.1 miles).

The South Route has a number of construction-sensitive areas which exist including the following:

- Four identified cemetaries
- Historic sites of Switzer Covered Bridge and Tarleton Tavern that must be avoided.
- 3,000LF (approximately) of waterline may be constructed within an Agricultural District.
- 4,000 LF of waterline construction through heavily wooded areas that have not experienced significant previous disturbance.

- 29 Stream Crossings with 45,000 LF (approximately) of waterline installed in proximity to streams.
- Significant creek crossing of Elkhorn Creek (in Switzer).
- 86,000 LF (approximately) of construction that will be required within highway right-of-way or under roadways
- Crossing of Interstate 75, US 62, US 460 and US 25.
- Construction along Ironworks Pike adjacent to the Kentucky Horse Park and multiple horse farms.

The preliminary estimate of construction costs for this option is $63,834,048 and is attached to this Memorandum.

## Recommendations

A review of the constructability elements of the project have been identified above. Some of the key comparisons between the routes are identified below.

- Both the North and Middle routes have substantial segments (between 6.25 and 9.0 miles) that are either located within the Kleber Wildlife Management Area or traverse areas that have not been previously disturbed by road or other significant construction activities. The South route does not traverse the Kleber WMA and has only a short distance (less than 1.0 mile) through previously undisturbed areas. In addition, the South route has approximately 86,000 feet of waterline that will be installed within highway right-of-way. This represents approximately 55% of the project and will minimize the impact on sensitive areas and local property owners.
- The North route and Middle routes have significant construction access challenges in the areas along Gill Branch, KY 897, King Lane and Plummers Branch. These areas presently have very limited access and would not be capable of supporting gravel trucks, semi-tractor trailers, etc. without improvement. This will impact production rates for stringing pipe, preparing bedding, backfilling and restoration activities.
- The South route has to traverse the Fish Hatchery area and the bluff above it. This will be very difficult and expensive construction. An evaluation of an aerial pipeline will have to be performed considering thrust restraint issues. Accessibility to this segment will be poor, however, this portion of the line is only about 400 feet in length. High pressure in the area around the fish hatchery will require Class 350 pressure pipe and restrained joint installation through much of the bottom lands.
- All of the routes will have to cross Elkhorn Creek. However, the Middle route also has a major creek crossing of Cane Run and the North route has to cross Cane Run and Cedar Creek. Therefore, the South route will have the lowest impact on the major creeks in the region.
- The South route traverses an agricultural district. We can find no prohibition or condition on waterline installation in this area.

- The South route has the shortest length of waterline installed in proximity to streams. This is relevant for constructability because construction in these areas can create unique challenges such as subsidence of the trench, risk of impacting local roadways, presence of substantial culverts, etc. The South Route has 71% of the streams compared to the Middle route and 79% as compared to the North route.
- The historic sites and cemeteries for all options will need to be avoided.

Based on the key items identified above and the preliminary opinion of probable construction costs, it is our recommendation that the South route be the selected option.

Kentucky American Water

Quest

***Transmission Mains from New WTP on Pool 3***
***Kentucky American Water***
***Preliminary Cost Estimate***
***February 1 , 2007***

***North Route***

| Item No. | Item | Qty. | Unit | Unit Price Material | Unit Price L&E | Unit Price Total | Total Price |
|---|---|---|---|---|---|---|---|
| 1 | General | | | | | | |
| | - General Conditions (0.5%) | 1 | LS | $ - | $ - | $ 297,364 | $ 297,364 |
| | - Mobilization (0.5%) | 1 | LS | $ - | $ - | $ 297,364 | $ 297,364 |
| | - Bonds and Insurance (1%) | 1 | LS | $ - | $ - | $ 594,729 | $ 594,729 |
| 2 | Pipeline | | | | | | |
| | - Earth Excavation | 135,000 | CY | $ - | $ 6 | $ 6 | $ 810,000 |
| | - Rock Excavation | 384,000 | CY | $ - | $ 35 | $ 35 | $ 13,440,000 |
| | - Bedding Material (6" below to 6" Above Pipe) | 261,000 | Tons | $ 8 | $ 3 | $ 11 | $ 2,871,000 |
| | - 42" Class 250 Ductile Iron (DI) Pipe | 146,000 | LF | $ 150 | $ 40 | $ 190 | $ 27,740,000 |
| | - 42" Class 250 Restrained Joint (RJ) DI Pipe | 20,000 | LF | $ 190 | $ 40 | $ 230 | $ 4,600,000 |
| | - 42" RJDI 45 Deg Elbows | 71 | EA | $ 7,250 | $ 1,500 | $ 8,750 | $ 621,250 |
| | - 42" RJDI 22 Deg Elbows | 58 | EA | $ 6,200 | $ 1,250 | $ 7,450 | $ 432,100 |
| | - 42" RJDI 11 Deg Elbows | 131 | EA | $ 6,200 | $ 1,250 | $ 7,450 | $ 975,950 |
| | - Stone Backfill | 300,000 | Tons | $ 8 | $ 2 | $ 10 | $ 3,000,000 |
| | - Earthen Backfill | 73,000 | Tons | $ 3 | $ 2 | $ 5 | $ 365,000 |
| | - Surface Restoration (excl. Pavement) | 575,000 | SY | $ - | $ - | $ 0.25 | $ 143,750 |
| 3 | Special Pipeline Conditions | | | | | | |
| | - 60" Steel Casing Pipe/Tunnel Liner Plates Under I-75 | 185 | LF | $ 350 | $ 750 | $ 1,100 | $ 203,500 |
| | - 60" Steel Casing Pipe, B&J | 410 | LF | $ 250 | $ 250 | $ 500 | $ 205,000 |
| | - Elkhorn Creek Crossing | 175 | LF | $ 250 | $ 500 | $ 750 | $ 131,250 |
| | - Cedar Creek Crossing | 125 | LF | $ 250 | $ 500 | $ 750 | $ 93,750 |
| | - Cane Run Crossing | 125 | LF | $ 250 | $ 500 | $ 750 | $ 93,750 |
| | - Fish Hatchery Vertical Wall (collars, extra measures, etc) | 300 | LF | $ 200 | $ 100 | $ 300 | $ 90,000 |
| | - Allowance for Construction Access to Undisturbed Areas | 33,000 | LF | $ - | $ 25 | $ 25 | $ 825,000 |
| | - Stream/Creek Crossings | 2,130 | LF | $ 200 | $ 150 | $ 350 | $ 745,500 |
| | - CSX Crossing | 185 | LF | $ 250 | $ 250 | $ 500 | $ 92,500 |
| 4 | Appurtenances | | | | | | |
| | - 42" Double Disc Gate Valves w/ Valve Box | 13 | EA | $ 60,000 | $ 3,000 | $ 63,000 | $ 819,000 |
| | - Fire Hydrants | 12 | EA | $ 3,500 | $ 2,000 | $ 5,500 | $ 66,000 |
| | - Combination Air Valves (4") | 17 | EA | $ 5,000 | $ 1,500 | $ 6,500 | $ 110,500 |
| | - Drains/Blowoffs | 9 | EA | $ 3,500 | $ 1,500 | $ 5,000 | $ 45,000 |
| | - Leak Detection Assembly | 1 | EA | $ 3,500 | $ 1,500 | $ 5,000 | $ 5,000 |
| | - Precast Vaults/MHs for CAV/Drains/Leak Detection | 17 | EA | $ 8,000 | $ 1,500 | $ 9,500 | $ 161,500 |
| 5 | Restoration | | | | | | |
| | - Concrete Driveway Replacement | 1,320 | SY | $ 15 | $ 7 | $ 22 | $ 29,040 |
| | - BP Lane Width Overlay Replacement | 13,000 | SY | $ 9 | $ 4 | $ 13 | $ 169,000 |
| | - BP Lane Width Replacement | 13,000 | SY | $ 12 | $ 5 | $ 17 | $ 221,000 |
| | - BP Driveway Replacement | 3,000 | SY | $ 8 | $ 8 | $ 16 | $ 48,000 |
| | - Crushed Stone Driveway Replacement | 670 | SY | $ 3 | $ 3 | $ 6 | $ 4,020 |
| | - Special Restoration Requirements (fencing, walls, etc.) | 10,000 | LF | $ 8 | $ 2 | $ 10 | $ 100,000 |
| 6 | Erosion Control Measures | | | | | | |
| | - Silt Fence | 165,400 | LF | $ 0.25 | $ 0.35 | $ 0.60 | $ 99,240 |
| | - Rock Checks | 75 | CY | $ 250 | $ 100 | $ 350 | $ 26,250 |
| 7 | Other Measures | | | | | | |
| | - Traffic Control | 30,000 | LF | $ - | $ 3 | $ 3 | $ 90,000 |
| 8 | Demobilization (0.5%) | 1 | LS | $ - | $ - | $ 281,491 | $ 281,491 |
| 9 | Contractor O&P (10%) | 1 | LS | | | $ - | $ 6,094,380 |
| | **Total Opinion of Probable Construction Costs** | | | | | | **$ 67,038,178** |

Kentucky American Water®

Quest

*Transmission Mains from New WTP on Pool 3*
*Kentucky American Water*
***Preliminary Cost Estimate***
*February 1 , 2007*

*Middle Route*

| Item No. | Item | Qty. | Unit | Unit Price Material | Unit Price L&E | Unit Price Total | Total Price |
|---|---|---|---|---|---|---|---|
| 1 | General | | | | | | |
| | - General Conditions (0.5%) | 1 | LS | $ - | $ - | $ 281,491 | $ 304,253 |
| | - Mobilization (0.5%) | 1 | LS | $ - | $ - | $ 281,491 | $ 304,253 |
| | - Bonds and Insurance (1%) | 1 | LS | $ - | $ - | $ 562,982 | $ 608,506 |
| | | | | | | | |
| 2 | Pipeline | | | | | | |
| | - Earth Excavation | 138,000 | CY | $ - | $ 6 | $ 6 | $ 828,000 |
| | - Rock Excavation | 392,000 | CY | $ - | $ 35 | $ 35 | $ 13,720,000 |
| | - Bedding Material (6" below to 6" Above Pipe) | 267,500 | Tons | $ 8 | $ 3 | $ 11 | $ 2,942,500 |
| | - 42" Class 250 Ductile Iron (DI) Pipe | 149,000 | LF | $ 150 | $ 40 | $ 190 | $ 28,310,000 |
| | - 42" Class 250 Restrained Joint (RJ) DI Pipe | 20,900 | LF | $ 190 | $ 40 | $ 230 | $ 4,807,000 |
| | - 42" RJDI 45 Deg Elbows | 72 | EA | $ 7,250 | $ 1,500 | $ 8,750 | $ 630,000 |
| | - 42" RJDI 22 Deg Elbows | 58 | EA | $ 6,200 | $ 1,250 | $ 7,450 | $ 432,100 |
| | - 42" RJDI 11 Deg Elbows | 135 | EA | $ 6,200 | $ 1,250 | $ 7,450 | $ 1,005,750 |
| | - Stone Backfill | 310,000 | Tons | $ 8 | $ 2 | $ 10 | $ 3,100,000 |
| | - Earthen Backfill | 75,000 | Tons | $ 3 | $ 2 | $ 5 | $ 375,000 |
| | - Surface Restoration (excl. Pavement) | 588,500 | SY | $ - | $ - | $ 0.25 | $ 147,125 |
| | | | | | | | |
| 3 | Special Pipeline Conditions | | | | | | |
| | - 60" Steel Casing Pipe/Tunnel Liner Plates Under I-75 | 185 | LF | $ 350 | $ 750 | $ 1,100 | $ 203,500 |
| | - 60" Steel Casing Pipe, B&J | 410 | LF | $ 250 | $ 250 | $ 500 | $ 205,000 |
| | - Elkhorn Creek Crossing | 150 | LF | $ 250 | $ 500 | $ 750 | $ 112,500 |
| | - Cane Run Creek Crossing | 125 | LF | $ 250 | $ 500 | | |
| | - Allowance for Construction Access to Undisturbed Areas | 47,000 | LF | $ - | $ 25 | $ 25 | $ 1,175,000 |
| | - Stream/Creek Crossings | 2,130 | LF | $ 200 | $ 150 | $ 350 | $ 745,500 |
| | - CSX Crossing | 185 | LF | $ 250 | $ 250 | $ 500 | $ 92,500 |
| | | | | | | | |
| 4 | Appurtenances | | | | | | |
| | - 42" Double Disc Gate Valves w/ Valve Box | 13 | EA | $ 60,000 | $ 3,000 | $ 63,000 | $ 819,000 |
| | - Fire Hydrants | 12 | EA | $ 3,500 | $ 2,000 | $ 5,500 | $ 66,000 |
| | - Combination Air Valves (4") | 17 | EA | $ 5,000 | $ 1,500 | $ 6,500 | $ 110,500 |
| | - Drains/Blowoffs | 9 | EA | $ 3,500 | $ 1,500 | $ 5,000 | $ 45,000 |
| | - Leak Detection Assembly | 1 | EA | $ 3,500 | $ 1,500 | $ 5,000 | $ 5,000 |
| | - Precast Vaults/MHs for CAV/Drains/Leak Detection | 17 | EA | $ 8,000 | $ 1,500 | $ 9,500 | $ 161,500 |
| | | | | | | | |
| 5 | Restoration | | | | | | |
| | - Concrete Driveway Replacement | 1,320 | SY | $ 15 | $ 7 | $ 22 | $ 29,040 |
| | - BP Lane Width Overlay Replacement | 13,000 | SY | $ 9 | $ 4 | $ 13 | $ 169,000 |
| | - BP Lane Width Replacement | 13,000 | SY | $ 12 | $ 5 | $ 17 | $ 221,000 |
| | - BP Driveway Replacement | 4,600 | SY | $ 8 | $ 8 | $ 16 | $ 73,600 |
| | - Crushed Stone Driveway Replacement | 670 | SY | $ 3 | $ 3 | $ 6 | $ 4,020 |
| | - Special Restoration Requirements (fencing, walls, etc.) | 10,000 | LF | $ 8 | $ 2 | $ 10 | $ 100,000 |
| | | | | | | | |
| 6 | Erosion Control Measures | | | | | | |
| | - Silt Fence | 165,400 | LF | $ 0.25 | $ 0.35 | $ 0.60 | $ 99,240 |
| | - Rock Checks | 75 | CY | $ 250 | $ 100 | $ 350 | $ 26,250 |
| | | | | | | | |
| 7 | Other Measures | | | | | | |
| | - Traffic Control | 30,000 | LF | $ - | $ 3 | $ 3 | $ 90,000 |
| | | | | | | | |
| 8 | Demobilization (0.5%) | 1 | LS | $ - | $ - | $ 281,491 | $ 281,491 |
| | | | | | | | |
| 9 | Contractor O&P (10%) | 1 | LS | | | $ - | $ 6,234,913 |
| | **Total Opinion of Probable Construction Costs** | | | | | | **$ 68,584,041** |

Kentucky American Water

Quest

*Transmission Mains from New WTP on Pool 3*
*Kentucky American Water*
***Preliminary Cost Estimate***
*February 1 , 2007*

*South Route*

| Item No. | Item | Qty. | Unit | Unit Price Material | Unit Price L&E | Unit Price Total | Total Price |
|---|---|---|---|---|---|---|---|
| 1 | General | | | | | | |
| | - General Conditions (0.5%) | 1 | LS | $ - | $ - | $ 281,491 | $ 284,465 |
| | - Mobilization (0.5%) | 1 | LS | $ - | $ - | $ 281,491 | $ 284,465 |
| | - Bonds and Insurance (1%) | 1 | LS | $ - | $ - | $ 562,982 | $ 568,931 |
| 2 | Pipeline | | | | | | |
| | - Earth Excavation | 129,000 | CY | $ - | $ 6 | $ 6 | $ 774,000 |
| | - Rock Excavation | 366,000 | CY | $ - | $ 35 | $ 35 | $ 12,810,000 |
| | - Bedding Material (6" below to 6" Above Pipe) | 250,000 | Tons | $ 8 | $ 3 | $ 11 | $ 2,750,000 |
| | - 42" Class 250 Ductile Iron (DI) Pipe | 139,590 | LF | $ 150 | $ 40 | $ 190 | $ 26,522,100 |
| | - 42" Class 250 Restrained Joint (RJ) DI Pipe | 13,955 | LF | $ 190 | $ 40 | $ 230 | $ 3,209,650 |
| | - 42" Class 350 RJ DI Pipe | 5,000 | LF | $ 225 | $ 45 | $ 270 | $ 1,350,000 |
| | - 42" RJDI 45 Deg Elbows | 68 | EA | $ 7,250 | $ 1,500 | $ 8,750 | $ 595,000 |
| | - 42" RJDI 22 Deg Elbows | 55 | EA | $ 6,200 | $ 1,250 | $ 7,450 | $ 409,750 |
| | - 42" RJDI 11 Deg Elbows | 126 | EA | $ 6,200 | $ 1,250 | $ 7,450 | $ 938,700 |
| | - Stone Backfill | 290,000 | Tons | $ 8 | $ 2 | $ 10 | $ 2,900,000 |
| | - Earthen Backfill | 70,000 | Tons | $ 3 | $ 2 | $ 5 | $ 350,000 |
| | - Surface Restoration (excl. Pavement) | 550,000 | SY | $ - | $ - | $ 0.25 | $ 137,500 |
| 3 | Special Pipeline Conditions | | | | | | |
| | - 60" Steel Casing Pipe/Tunnel Liner Plates Under I-75 | 185 | LF | $ 350 | $ 750 | $ 1,100 | $ 203,500 |
| | - 60" Steel Casing Pipe, B&J | 410 | LF | $ 250 | $ 250 | $ 500 | $ 205,000 |
| | - Elkhorn Creek Crossing | 175 | LF | $ 250 | $ 500 | $ 750 | $ 131,250 |
| | - Fish Hatchery Vertical Wall (collars, extra measures, etc) | 300 | LF | $ 200 | $ 100 | $ 300 | $ 90,000 |
| | - Stream/Creek Crossings | 2,130 | LF | $ 200 | $ 150 | $ 350 | $ 745,500 |
| | - CSX Crossing | 185 | LF | $ 250 | $ 250 | $ 500 | $ 92,500 |
| 4 | Appurtenances | | | | | | |
| | - 42" Double Disc Gate Valves w/ Valve Box | 13 | EA | $ 60,000 | $ 3,000 | $ 63,000 | $ 819,000 |
| | - Fire Hydrants | 12 | EA | $ 3,500 | $ 2,000 | $ 5,500 | $ 66,000 |
| | - Combination Air Valves (4") | 17 | EA | $ 5,000 | $ 1,500 | $ 6,500 | $ 110,500 |
| | - Drains/Blowoffs | 9 | EA | $ 3,500 | $ 1,500 | $ 5,000 | $ 45,000 |
| | - Leak Detection Assembly | 1 | EA | $ 3,500 | $ 1,500 | $ 5,000 | $ 5,000 |
| | - Precast Vaults/MHs for CAV/Drains/Pig/Leak Detection | 17 | EA | $ 8,000 | $ 1,500 | $ 9,500 | $ 161,500 |
| 5 | Restoration | | | | | | |
| | - Concrete Driveway Replacement | 1,320 | SY | $ 15 | $ 7 | $ 22 | $ 29,040 |
| | - BP Lane Width Overlay Replacement | 21,800 | SY | $ 9 | $ 4 | $ 13 | $ 283,400 |
| | - BP Lane Width Replacement | 21,800 | SY | $ 12 | $ 5 | $ 17 | $ 370,600 |
| | - BP Driveway Replacement | 4,600 | SY | $ 8 | $ 8 | $ 16 | $ 73,600 |
| | - Crushed Stone Driveway Replacement | 670 | SY | $ 3 | $ 3 | $ 6 | $ 4,020 |
| | - Special Restoration Requirements (fencing, walls, etc.) | 16,000 | LF | $ 8 | $ 2 | $ 10 | $ 160,000 |
| 6 | Erosion Control Measures | | | | | | |
| | - Silt Fence | 165,400 | LF | $ 0.25 | $ 0.35 | $ 0.60 | $ 99,240 |
| | - Rock Checks | 75 | CY | $ 250 | $ 100 | $ 350 | $ 26,250 |
| 7 | Other Measures | | | | | | |
| | - Traffic Control | 48,000 | LF | $ - | $ 3 | $ 3 | $ 144,000 |
| 8 | Demobilization (0.5%) | 1 | LS | $ - | $ - | $ 281,491 | $ 281,491 |
| 9 | Contractor O&P (10%) | 1 | LS | | | $ - | $ 5,803,095 |
| | **Total Opinion of Probable Construction Costs** | | | | | | **$ 63,834,048** |

You are invited to register:

| Name | Address | Phone | Email |
|---|---|---|---|
| ✓ Thomas & Louise Quarles | | 502-227-7839 | |
| ✓ Patrick Kennedy | 19980 Kays Branch | 682-9489 | |
| ✓ Nathan & Allison Depenbrock | 7283 Peaks Mill Rd | 227-1725 | |
| ✓ [illegible] (Rickey French) | 15280 127 South | | |
| ✓ Mark Schimmoeller | 852 Gregory Wood Rd Frankfort Ky 40601 | | |
| ✓ Mike Larimore | 1374 Indian Gap Frankfort | | |
| David Quarles | 4121 Peaks Mill Rd Fft 40601 | 227-8132 | |
| ✓ Thomas & Helen Kincaid | 519 Greenup Ave. Frankfort Ky 40601 | 502/875-1659 | |
| ✓ Ed Council | 7265 Peaks Mill Rd 40601 | (502) 227-1116 | |
| ✓ Kenneth Driskell | 15348 Owenton Rd | 2272847 | |
| ✓ Eric Thoreson | 6850 Georgetown Rd | 8594948766 | |
| ✓ Kevin Phillips | 1803 Woodlake Rd | 502-695-5115 | |
| 13 ✓ Jack Kuhn | 248 Sulphur Lick Rd | 875-0281 | |

T = 41



Kentucky American Water

PM

You are invited to register:

| Name | Address | Phone | Email |
|---|---|---|---|
| OLIN METFORD | 6076 ROCKY BRANCH | 502-227-7290 | |
| LINDA METFORD | " | " | |
| JAMES JORDAN | 730 WOODLAKE RD | 502-695-4618 | |
| Dean Rambo | 7686 Peaks mill | 502-223-2995 | |
| Lee Trontwine | 6057 Peaks Mill Rd | 502-875-1868 | |
| Margaret Q. Travis | 344 McDonald Fry Rd | 502-223-8866 | |
| [illegible] Thompson | 29 Still House Hollow | 502-223-0869 | |
| Lowell Clark | 2445 Indian Gap RD | 502-223-0825 | |
| [illegible] Wilson | 14070 Old Frankfort [illegible] | 502-875-1901 | |
| GEORGE T SHERA | 535 INDIAN GAP RD | 502-875-4408 | |
| Patrick Kennedy Dara Carlisle | 1890 Kays Branch Rd | 502-484-2017 | |
| John Harrod | 1860 Kays Branch Rd. | 502-484-2044 | |
| Edward Colley | 1402 Equestrian Way | 502-848-0155 | |
| Robby Parrish | 2038 Peaks Mill Rd | 502-2230139 | |
| Andy McDonald | 2235 Gregory Woods Rd | 502-223-7936 | |
| Ken Teron | 3071 Sulphur Lick rd | 502-223-4158 | |
| Brenda Teron | 3015 " | " | |
| Rob Parker | 7394 Peaks Mill Rd | (502) 875-4289 | |
| Chuck Quarles | 408 Indian Gap Rd. | (502) 875-5552 | |
| 20 Jennifer Lindberg | 852 Gregory Woods Rd | (502) 227-4241 | |

You are invited to register:

| Name | Address | Phone | Email |
| --- | --- | --- | --- |
| Roger & Wilma Faulkner | 3310 Union Ridge | 5025359277 | Wfaulkee1@aol.com |
| Ida Lanning | 1101 Indian Gap Rd. | | |
| Carol & Don Moore | 605 Indian Gap | | |

5



PM

# SIGN IN

Monterey

| Name | Address | Phone/email |
|---|---|---|
| Donald W. Smither II | 580 Duncan Rd Frankfort, KY 40601 | 502 695-4110 donald.w.smither@ky.ngb.army.mi |
| Dustin W. Smither | 100 Steele Branch Rd Frankfort, Ky 40601 | (502) 330-2831 / NA |
| Ray Smith | 655 [illegible] ST [illegible] | 502-484-5339 |
| Mary Robson | 14166 Owenton Rd Frankfort | 502 875-5802 |
| Jerry Kaiser | 14150 US 127 S Owenton | Jerry.Kaiser@ky.ga |

Monterey

# SIGN IN

| Name | Address | Phone/email |
|---|---|---|
| John & Bayley Spicer | 1935 Kays Branch | 502-484-9989 |
| (Lenora) Bee Spicer | 1505 Kays Br. Rd | 502-484-2666 |
| Rick Morgan (Michael?) | 217 W. Perry St. Owenton | 502-484-3090 Richamorgan@hotmail.com |
| John & Julia Bice | 13935, 13933, 13931 US 127 North Frankfort KY 40601 | 502 552 2086 Senorabice@aol.c |
| M. Todd Akers | 1177 Sharp Rd Stamp. Grd | 502 535-4729 |
| Joel Dufour | 660 Mt. Vernon Rd Frankfort, Ky 40601 | 502-226-5751 |
| (Chris Schimoeller) | | |

Monterey

# SIGN IN

| Name | Address | Phone/email |
|---|---|---|
| ⑤ Philip & Lena Ellis (Ellis Greenhouse?) | 1016 Silver Lake Blvd Frankfort KY 40601 | 502/695-6862 |
| Ben Miller | 1085 Gratz Rd - Owenton | |
| ✓ Harold Robinson | 467 Indian Gap Rd | |
| Milkweed Water | | (502) 750-2935 MILKWEED@BELLSOUTH.NET |
| ✓ on list ~~Ok~~ Mary Meade ? | 14170 Owenton Rd. | mameade@bellsouth.net 502-223-7295 |
| David B-Lilly | 408 South main Owenton | 502-484-2791 davidlilly-51@Hotmail.com |
| ✓ Bruce & Joy Irwe | 1875 Cedar Creek R. Owenton KY | |
| Teresa Davis | 4325 Georgetown Rd P.O Box 495 Owenton | |

White Sulfur Springs
12/14/06

You are invited to register:

| Name | Address | Phone | Email |
|---|---|---|---|
| √ Ken Schultz | 367 Etter Lane | 502-867-1551 | |
| √ Clyde R Kirk and Viola Kirk | 5116 Ironworks | | |
| √ Dan F. Coffman | 779 Snavely Rd Stamp-Gr. 40379 | 502-535-7722 | DCOFFMAN @MIS.NET |
| √ Ben Prewitt | 7282 G-Town Rd Midway 40347 | | |
| √ Chris Miller | 509 Craig Lane Georgetown 40324 | | |
| √ Kenneth & Sue True (? Henry C ?) | 2766 Frankfort Rd Geo 40324 | | |
| Don Wells + Patsy [illegible] Wells | 114 Lynette Dr Geo Ky 40324 | | |
| Brenda Childers & Tony | 3043 Fishers Mill Midway | 502/8630681 | |
| √ Rick Wallin | P.O. Box 502 Midway, Ky 40347 | | |
| √ Tony Curtsinger (listed under Tony) | 4541 Georgetown Rd Lex, Ky 40511 | | |
| √ Hannah Helm | 174 Jessamine Dr. Lex 40503 | | |
| Jim Dwyer | 3057 Houston Antioch Ky 40516 | | |
| Russell Stevens | 4200 Frankfort Rd. 40324 | | |
| √ Dal Webster | 628 Craig Lane Geo 40324 | | |
| √ Paul & Janet Holland | 100 Merlin Dr, Georgetown, Ky 40324 | | |
| √ [illegible] (Franklin?) | 1638 Cane Run Pk Geo. Ky 40324 | | |

1?

12/12/06

You are invited to register:

| Name | Address | Phone | Email |
|---|---|---|---|
| ✓ Dean House | 1018 Bonds Rd | 502-535-6890 | |
| ✓ Neyda Darby | 3011 Stamping Gr. Rd | 502 535 6806 | |
| ✓ Calvin Clark | 3607 Owenton Rd | 535-6161 | |
| Paula Cleveland | 1081 Stamping Gr. Rd. | 863-3430 | |
| ✓ Linda Kimbale | 648 Sharp Rd | 535-6906 | |
| ✓ Steven C Smith | 2828 Sutter Rd Frankfort Ky | 502 695769 | |
| ✓ Joyce Rice Tackett | 2786 Stamping Ground Rd Stamping Grd | 502 535 6655 | |
| ✓ Holly Ware | 1045 Cane Run Rd. Georgetown | 502 863-1460 | |
| ✓ Tommy Puckett | 1009 Turkey Foot Rd bex | 859-266-0745 | |
| Steve & Janice Hockensmith | 103 Stonetown St. Ground | (502) 535 6508 | |
| ✓ William Katz | 263 Galloway Road St. Grd Ky | (502) 535-4523 | |
| ✓ Lee Ray | 111 Stamping Ground Rd. Frankfort | (502) 695-5338 | |
| ✓ Wayne Robey (Marvin Robey Trust) | 2455 Stamping Ground Rd Stamping Ground, Ky 40379 | (859) 533-4695 (cell) | |
| ✓ Roy & Gretchen Soards | 1043 Galloway Stamping Grd Ky 40379 | (502) 863-2582 | |
| ✓ Jim & Jan Naree | 1010 Galloway Rd Stamping Ground Ky | 863-265 | |
| ✓ Helen Odelmal | 1281 Sharp Rd Stamping Ground | 859.420.4674 | |
| ✓ Robert Geyer | 994 Galloway Rd. Stamping Ground | (502) 863-2029 | |
| ✓ Paul Tackett | 2087 Stamping Ground Rd, Georgetown, Ky. | 502-867-298 | |
| ✓ Joe Arnold | 4714 Ironworks | 846-5697 | |
| ? ~~Bob~~ Riddle (Many Riddles) | 603 Fishers Mill Rd. | 846-4869 | |

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Stamping Ground

12/12/06

You are invited to register:

| Name | Address | Phone | Email |
|---|---|---|---|
| √ Catherine C. Jaeger | 1210 Stamping Gr. Rd | (502) 863-2073 | CTA45@ Hughes.net |
| √ CARL E. SULLIVAN | 289 GALLOWAY RD. STAMPING GROUND KY | 5025359850 | |
| √ James A. - Judy Mullarnie | 110 Pebblebeach Dr. Georgetown | 859-494-1929 | |
| √ [illegible] | 680 Galloway Rd, St. Grd | 502-535-[illegible] | |
| √ ED MERKLER | 2724 STAMPING GROUND ROAD - STAMPING GROUND | 502-535-705[illegible] | |
| √ Robt Hall | 1549 Stamping Gr Rd Georgetown 40324 | 502 863-2304 | |

Stamping Ground

Stamping Ground

12/12/06

## You are invited to register:

| Name | Address | Phone | Email |
|---|---|---|---|
| Donna Russell | 25 a Galloway | 502-535-5974 | |
| Bonnie Riddle | PO Box 2 Stamping Grd. | 535-7056 | |
| Bonnie Purvis | 3181 Main Street Stamping Grd. | 535-6822 | |
| Chauncey Whitman | 3466 Main Stamping Ground KY | | |
| Patty & Billy Thomas | 3179 Main St. Stamp. Grd | 502-330-1855 | |

22

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓ at this stage of the project

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ✓

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

We need to know if effects our land on 227 and Sharp Pike due to plan build to new homes (two) on 227 and Sharp Pike in next year or two.
Contact James A. Mullanix (AL) at 859-494-1929 during the day time 8am - 6pm.
James Mullanix

Kentucky American Water®



56

73

## You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ✓

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

______________________________________________________________

______________________________________________________________

Kentucky American Water®

SG

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ✓

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

______________________________________________

______________________________________________

Kentucky American Water®



56

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful X

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable X

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily X

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

______________________________________________________________

______________________________________________________________

Kentucky American Water®



SG

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ✓

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

I support the Bluegrass Water Supply Commission & urge you to participate together in this supply line

Catherine C Jacob

Kentucky American Water®



SG

7

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful _✓_

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable _✓_

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily _✓_

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

___________________________________________

___________________________________________

Kentucky American Water®



SG

28

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ✓

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

___________________________________________

___________________________________________

Kentucky American Water®



SG

## You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful X

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable X

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction X

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

______________________________________________________________

______________________________________________________________

Kentucky American Water®

30

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ✓

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

______________________________________________

______________________________________________

Kentucky American Water®



SG

## You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ___ helpful

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

Everything looks fine to me.

filled out for attendee by K Olsen based on what he wanted it to say

Kentucky American Water®

2

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ✓

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

T. C. Quarles
431 McDonald Ferry Frankfort, Ky 4060

Kentucky American Water®



PM

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful X

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable X

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction X

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

______________________________________________________________

______________________________________________________________

Kentucky American Water®



PM

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ___

   Not very helpful _√_

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable _✓_

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily _✓_

   Not very satisfactorily _✓_

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

Ricky French

502-607-1855 (W) / 502-395-2313 (H) AFTER 6:00

Kentucky American Water®



PM

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ✓

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

LEE@TROUTWINE.ORG

Kentucky American Water®



PM

## You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

Want to extend the comment period at least to the end of Jan. 07, if not longer. It's going down my lane & no time to think about it in detail.

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

Dara Carlisle, 1880 Kays Branch Rd (King Ln) Owenton 502-484-2017 betw 5-8:30 M-F

Kentucky American Water®



PM

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful _X_

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable _X_

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily _X_

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

______________________________________________

______________________________________________

Kentucky American Water®



PM

7

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

Some questions could not be Answered (At this time)

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable ✓

   Not very knowledgeable ___

   Not at all knowledgeable ___

Seem to be well informed About pipe lines. Less informed on possible impact to landowners

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ✓

   Not very satisfactorily ___

   Unsatisfactorily ___

See Above

Need to put off/extend comment period to at least Jan 31, 2007 Be Able to give landowners better direction

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

Patrick Kennedy 1880 Kay's Branch Rd (Kings Lane)
Owenton KY 40359 502-682-9489

Kentucky American Water®



PM

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ✓

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

A formal question + answer session could possibly be helpful.

Chuck Quarles
408 Indian Gap Road
Frankfort, Ky. 40601
502-875-5552

Kentucky American Water®

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable ✓

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ___ — need more details

   Not very satisfactorily ___ - lots more details

   Unsatisfactorily ✓ 1000' hard to tell much

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

Michael Larimore
1374 INDIAN GAP Rd
Frankfort Ky 40601 564-4957

need to extend the comment period as long as possible.

Kentucky American Water®



PM

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ✓

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

Carol Hummel/Moore
605 Indian Gap Rd
F-fort KY 40601

Kentucky American Water®



PM

## You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable ✓

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ✓

   Not very satisfactorily ___

   Unsatisfactorily ___

*Please have a follow up meeting w/ representatives giving a presentation w/ opportunities for public comment/discussion (ie town mtg format) so that we can come up with a solution.

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

Jennifer Lindberg, 852 Gregory Woods Rd. Frankfort 40601

Kentucky American Water®



PM

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable ✓

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ✓

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

________________________________________

________________________________________

Kentucky American Water®



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Not very helpful ___

Not at all helpful ___

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___

___

Kentucky American Water®



PM

15

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   Very helpful ___

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   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ___

   Not very satisfactorily ✓

   Unsatisfactorily ___

If you want to promote this project successfully & have the support of the affected landowners & avoid challenges & condemnation battles, you cannot achieve this with one letter and an open house just before Christmas when everyone is too busy to consider all the ramifications, I am not necessarily opposed to the project at this point, but I will certainly oppose it if I am not allowed the time & opportunity to acquaint

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

John Harrod, 1860 Kays Branch Rd. Owenton, Ky
502-484-2044 lostjohnharrod@yahoo.com.

myself with the facts, I strongly urge you to extend the comment period to January 30 2007. I would look forward to more public opportunities to learn more about this proposal

Kentucky American Water®



PM

\6

# You are invited to take our survey and offer comments:

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   Very helpful ✓

   Somewhat helpful ___

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______________________________________________

______________________________________________

Kentucky American Water®



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   Unsatisfactorily ___

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great finally

Kentucky American Water®



PM

18

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

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Kentucky American Water®



PM

a

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1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

historic community Morgadore cemetery off Gill Branch North + middle

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

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   Unsatisfactorily ___

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young man / Environmental consultant / another filled out survey but did not put this on sheet. Came up during discussion & I documented it w/ him there - M Ilwsen

Kentucky American Water®



PM

nb

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

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   Not at all knowledgeable ___

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   To my complete satisfaction ___

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

Answered quest @ where water would come from Frankin Co. No. I know water. He will (not change water to be hoped it was going the new water

told to M Oliver

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

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_______________________________________________

Kentucky American Water®



PM

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful X

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable X

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily X

   Not very satisfactorily ___

   Unsatisfactorily ___

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~~[illegible]~~ I think this pipeline would be un-necessary if better customer education existed regarding water conservation methods. Demand-side management is the wave of the future.

[illegible]

At the very least, we believe the Public involvement period should at least extend through the month of January, to give Residents the opportunity to air their concerns + preferences before a route is decided.

Mont

Kentucky American Water®

## You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

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   Unsatisfactorily ___

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   Jerry.Raisor@ky.gov

Kentucky American Water®

48

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to ~~be~~

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   Unsatisfactorily ___

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It sounds like a great idea for Somebody else's Property

Lenora Spicer

Kentucky American Water®



Mont

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   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

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   Not very knowledgeable ___

   Not at all knowledgeable ___

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   To my complete satisfaction ✓

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

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We don't have any questions; I assume you will email us with updates as progress happens with this project. John + Julie Brice

Kentucky American Water®



Mont

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Very helpful ___

Somewhat helpful ___

Not very helpful ___

Not at all helpful ___

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Blue Route, Blue Route, Blue Route

Kentucky American Water®



Mont

15

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   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

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for Emergency response would like to ask that Owen Co. Emergency agencies be included in future meetings again

Kentucky American Water®



Mont

53

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1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

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   To my complete satisfaction ✓

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Kentucky American Water®



Mont

53

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful _✓_

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable _✓_

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily _✓_

   Not very satisfactorily ___

   Unsatisfactorily ___

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Let me know what route you choose

Spicer-61502@Earthlink.net

Kentucky American Water®



Mont

54

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓ some more so than others

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ✓

   Somewhat satisfactorily ___

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   Unsatisfactorily ___

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Kentucky American Water®



Mont

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Very helpful √

Somewhat helpful ___

Not very helpful ___

Not at all helpful ___

2. I found the staff of the open house to be

Very knowledgeable √

Somewhat knowledgeable ___

Not very knowledgeable ___

Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

To my complete satisfaction √

Somewhat satisfactorily ___

Not very satisfactorily ___

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Kentucky American Water®



Mont

56

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful yes

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable yes

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

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   To my complete satisfaction ___

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   Not very satisfactorily ___

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Ray Smith 655 Crittenden St [illegible] Ky 40359
502 484 5339

Kentucky American Water®



Mont

57

# You are invited to take our survey and offer comments:

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   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

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Kentucky American Water®



Mont

58

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   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ___

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Kentucky American Water®



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Kentucky American Water®



WSS

32

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

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Kentucky American Water®



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   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

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   Not very knowledgeable ___

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   To my complete satisfaction ✓

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

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______________________________________________

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Kentucky American Water®



WSS

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful X

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable X

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

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   To my complete satisfaction X

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

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BRING it ON Thanks

Kentucky American Water®



WSS

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1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

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   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

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Kentucky American Water®

WSS

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   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ___

   Somewhat satisfactorily ?

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

Please be careful of [illegible] clean-up + repair

Thanks

Tim Dugan

Kentucky American Water



WSS

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

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   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

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________________________________________________

________________________________________________

Kentucky American Water®

WS-5

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable ✓

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ✓

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

If you Can it would be good & Save Cost to put the pipe in at the intersection of US 25 & [illegible]

Tony [illegible]

Kentucky American Water®



WSS

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ___

   Somewhat knowledgeable ✓

   Not very knowledgeable ___

   Not at all knowledgeable ___

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______________________________________________

______________________________________________

Kentucky American Water®



WSS

# You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful _✓_

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable _✓_

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

3. My questions, based on what is known about the project at this time, were answered

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   Not very satisfactorily ___

   Unsatisfactorily ___

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___________________________________________

Kentucky American Water®



W 55

## You are invited to take our survey and offer comments:

1. The information I received at the open house was

   Very helpful ___

   Somewhat helpful ✓

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

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Kentucky American Water®



W55

X√

# You are invited to take our survey and offer comments:

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   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

   Somewhat knowledgeable ___

   Not very knowledgeable ___

   Not at all knowledgeable ___

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Kentucky American Water®

W 55

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1. The information I received at the open house was

   Very helpful ✓

   Somewhat helpful ___

   Not very helpful ___

   Not at all helpful ___

2. I found the staff of the open house to be

   Very knowledgeable ✓

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3. My questions, based on what is known about the project at this time, were answered

   To my complete satisfaction ✓

   Somewhat satisfactorily ___

   Not very satisfactorily ___

   Unsatisfactorily ___

4. If you have additional comments, please provide your name, address, phone number, and e-mail address, if applicable, so that a Kentucky American Water project manager can contact you. Please indicate how you prefer to be contacted and the best time to reach you.

Kentucky American Water®

WSS

XX

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Kentucky American Water®



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**KENTUCKY-AMERICAN WATER COMPANY**
**CASE NO. 2007-00134**
**COMMISSION STAFF'S FIRST SET OF INTERROGATORIES**
**AND REQUEST FOR PRODUCTION OF DOCUMENTS**
**Item 26 of 34**

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**Witness:** **Linda C. Bridwell**

26. Refer to Direct Testimony of Linda Bridwell at 34-35.

    a. Provide a copy of the survey used at the December open houses and a summary of the responses received from the survey.

    b. Provide a current copy of the log maintained as part of the toll free number established to communicate with property owners.

**Response:**

a. Please see the attached.
b. Please see the attached.

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4. If you have additional questions, please provide your name and phone number so that a Kentucky American project manager may call you.

______________________________________________________________

**Open House Letter Feedback re:**
**Water Supply Project**
(Revised 01/30/07)

| Date | Name | Address, if provided | Phone | Comments | Followup? | Response |
|---|---|---|---|---|---|---|
| 12/6/07 | Thomas Kincaid | | 502-875-1659 | Spoke to Susan. Received letter re: open house and is concerned about location of intake, which will be approx. 4 miles from the Monterey Dam. He has had problems with a state project in the past, which took his home and two barns. He will try to attend one of the open houses to get more details on project from technical team. | NA | No followup requested. He will attend open house |
| 12/6/07 | Don Richards | | 502-863-0730 | Spoke to Nancy. "Kentucky American has really missed things up and these people won't realize what they have done until many years down the road." He wanted to confirm that he did not have to become a KAW customer. | NA | No follow up requested. |
| 12/6/07 | Jennifer Lindburgh | Lives in Franklin County, owns property in Owen County | 502-395-1637 | Would like the comment period to be extended to end of January. Doesn't feel December gives her enough time to review information and make informed comments. | | Susan called back and left a message acknowledging her concern. 1/15/07 -- S. Lancho left message re: 1/23 open house. |
| 12/11/06 | Chris Schimmoeller | Earth Tools | 502-226-5751 | Concerned about timing of open houses during holiday season; very disappointed and thinks it is intentional. Would like extension to January. | SL | Asked Linda to call her back. 12/15 - Called back; she could not attend meetings. She said they want to comment about whole area impact -- love natural area and don't want to see it impacted. Has call into PSC to understand process of public hearings; wants to know demand-side management information; wants to know alternative routes; wants to see why conservation won't solve problem and what went into reaching this conclusion. Packet of O'Brien and Gere report, PSC update and DMP sent on 1/8/07 |
| 12/11/06 | Joel Dufour | Representing Spicer Farm | 502-484-3988 | Poor timing of open houses during busiest time of year for most people; he said he had only one week's notice. Can't believe timing and requests extension of public comment period to end of January. | | Susan called back. He will try to attend the open house at Monterey. Would like additional opportunity. Packet of O'Brien and Gere report, PSC update and DMP sent on 1/8/07 |
| 12/1/06 | Trina Peiffer | 3050 W. State Road Engli | 812-739-4279 | Lives in Indiana and owns property near proposed routed. Asked for property comment to be extended to end of January. Concerned about trees being removed along roads. Suggests staying along already developed roadways to mitigate environmental impact (like 127). Will be moving to Kentucky soon, but didn't receive packet. | SL | S. Lancho sent packet sent to Indiana address. S. Lancho called on 1/16/07 to inform/remind her about 1/23 question and answer session in Peaks Mill. |

**Open House Letter Feedback re:**
**Water Supply Project**
**(Revised 01/30/07)**

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|---|---|---|---|---|---|---|
| 12/1/06 | Betty Beshoar | | 502-227-2695 | Interested in providing comment after January. Endangered Braun's rock cress -- Peak's Mill on route 1262 on Elkhorn Creek. Been identifed as the nature reserve commission. Will contiguous forests be jeopardized? Will attend open house | NA | On 1/15/07 S. Lancho called to make sure Betty knew about 1/23 session in Peaks Mill. |
| 12/1/06 | Carol Hummell | Indian Gap Road | Did not leave phone number | Need more time to consider project | | |
| 12/1/06 | Jane Bogardus | 1245 Sharp Road | | Did not receive letter. Heard from neighbors about project. Requested copy of letter. | SL | Sample of packet mailed. |
| | | Stamping Ground, KY 40379 | | | | |
| 12/12/06 | Judge Robert Roach | Franklin County judge | 502-875-8751 | Has received calls from one or some residents re: concerns about timing of open houses during holiday season. | SL | Susan assured judge we are working with residents who let us know they have concerns but can't attend meetings. Called office on 1/16/07 (now Judge Ted Collins office), to inform Judge about 1/23/07 session, should he receive calls or wish to attend. |
| 12/12/06 | Jim McClanahan | 3600 Frankfort Road Georgetown KY | 863-2370 | Questions re: southern route, but can't make it to tonight's meeting. Has two properties-- one on Iron Works (would pipe be on north or southern side of road?. Please call. | BT | Brent spoke with Jim McClanahan (863-2670) regarding the project after he contacted KAWC. Mr. McClanahan was interested in knowing which of the routes was most likely to be chosen since he had property along one of the options. I explained that no preliminary determination had been made and that the final decision would be based on several factors including line length, local impact, constructability and property considerations. Mr. McClanahan indicated that he was a County Magistrate and had property along the Southern Route. I told him the South route was the shortest. We talked about his property location and he felt we would not be on his side of the road due to construction obstacles. I did not confirm this although it did appear he was correct. He expressed no objections to the project and hoped that fire flow would be available to local residents. The call was very cordial. |

**Open House Letter Feedback re:**
**Water Supply Project**
**(Revised 01/30/07)**

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| 12/14/06 | Andy McDonald | 2235 Gregory Woods Road Frankfort, KY 40601 | 502-223-7936 sol | Attended Peaks Mill open house but found it ineffective. Suggests a public hearing with presentations so that overview of project can be presented followed by Q and A. He wants to be able to hear what other property owners think. Also said he had to wait 30 min before speaking with someone at Peaks Mill. Wants to see documentation re: why project is needed and what has been done to manage demand through conservation. Said he has worked with electric utlities that were able to solve demand problems through more conservation. He did not share any specific property concerns when asked. | SL | Packet of O'Brien and Gere report, PSC update and DMP sent on 1/8/07 |
| 12/15/06 | Mark Schimmoeller | 852 Gregory Woods Road | 502-227-4241 | Wants comment period extended. Prefers southern route due to less disturbance of woods and property. How much disturbance will there be on sides of roads. Concerns re: 50' of clearance for installation (is this correct?) -- disturb creek and forests in Peaks Mill. Wants to see other routes originally considered. Thinks property owners should have brought into process from onset because they will be affected. Thinks that we should approach problem from demand side. | SL | Packet of O'Brien and Gere report, PSC update and DMP sent on 1/8/07 |
| 12/15/06 | Eric and Nikki Bauman?? | Off Caves Branch Road | 502-484-3020 | Neighbors got letter but they didn't. Is water line going on their property? | LB | |
| 12/18/06 | Dara Carlisle | 1880 Kay's Branch Road (lives on Keene Lane) Owen | 502-682-9490 | Request of similar-sized lines to detect noise quality; doesn't understand how comments will be reviewed. Wants extension of time period. Has heard that water lines of that size make a great deal of noise -- says people in populated areas wouldn't hear it because they are used to gray noise. | SL/Rick Buchanan | 12/27/06 - Rick Buchanan spoke with Ms Carlisle about her concerns of noise in water lines. She asked for some locations of rural lines that KAW currently have that she may check herself. He gave her the directions to 2 locations -- Stone Road at the Newtown Booster and Cedar Creek off Evansmill |
| 12/18/06 | Steve Ross | Property on Galloway | 502-867-4479 | Unable to attend meetings; wants to know more about construction on hilly property. Called again on 1/3/07. | LB | Linda called Mr. Ross on 1/3/07. He is on the middle route, and she indicated that the southern route is the shortest and appears to have the least environemental concerns. He said his property drops off nearly 12 feet on a 45-degree slope from a very narrow road, while the other side goes uphill about the same grade. Linda told him we were looking specifically at laying under the pavement on difficult construction areas, which it sounds like his might be, and that we were working with the Highway department on those. He asked how we were going to cross the Elkhorn, and I indicated we would not lay on the bottom, but would either build coffer dams and dig under the stream bed, or directional drill in environmentally sensitive areas, which can be done up to 1000 feet. |

**Open House Letter Feedback re:**
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**(Revised 01/30/07)**

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| 12/20/2006/ | Chris Schimmoeller | | 502-226-5751 | Appreciated follow up; would like to schedule meeting in January with us and perhaps other property owners to gain more information about property concerns. | SL | He asked about the schedule and I indicated we would be making a decision at the end of January and notify property owners of the selected route, and file a Certificate Case in the Spring, with hope to be on line in mid-2010. |
| 12/21/07 | Ed Councill | 7265 Peaks Mill Rd in Frankfo | By email | Sent letter indicating several questions re: projects and concern that more detail is not available re: three routes suggested. Recommended middle route. Supports water supply project but disappointed with process of selecting a route. | SL | 12/22 - Confirmed receipt of letter and will share comments with project team; 1/8 - Followed up again with Mr. Councill to let him know about January 23 Q and A session in Peaks Mill and provided water supply information/studies and demand management plan. |
| 12/26/06 | Ron Gruzesky | 4725 Iron Works Drive Georgetown | 502-229-2250 | Has property on Iron Works; wanted to log his comments that he has several mature trees and horse fencing near roadway. Horse fencing goes within 15 feet. He is supportive of project but will look forward to more info. While work is being done, any chance that a bike trail can be installed along road? | | |
| 12/26/06 | Adam Saaid | P.O. Box 80164 Fairbanks Alaska 99708 | 502-472-5200 | Lives on Mount Vernon Road but will be in Alask for next month; would like map of proposed routes; just learned of project. | SL | I also let him know that there may be a meeting at Peaks Mill School in late January because some other property owners had additional questions. I urged him to call us back if he had any other questions. |
| 12/27/07 | Mark Schimmoeller | 852 Gregory Woods Road Frankfort, KY 40601 | 502-227-4241 | Sent letter expressing concerns about project and wants comment period extended. Of three routes, prefers Southern Route. Indicates will use legal means to oppose project if necessary. Asked if KAW has conservation plan that would help problem. | SL | Letter dated 12/27 but routed through other office -- not received until 1/16. Had already spoken to Mr. Schimmoeller and and sent packet on 1/8. Called to confirm receipt of information. |
| 1/3/07 | Mr. Again | 338 Soards Road | 859.338.0577 | Lives in Scott County and has questions about the middle route. | LB | Linda spoke to Mr. Agin on ???? |
| 1/3/07 | Chris Schimmoeller | | 502.226.5751, x3 | Called re: using old elementary school in Peaks Mill on January 23. Estimates 15-20 people will attend. | SL | S. Lancho to follow up with Nancy on logistics and then with Chris. |
| 1/4/07 | Tim Porritt | Switzer in Franklin Co. | 502-564-3160 | Has route been selected? May be interested in attending 1/23 meeting in Peaks Mill. E-mail address is 2005stix@fewpb.net. | SL | Susan shared information and will follow up re: 1/23. |
| 12/29/06 | Joel Dufour & Chris Schimmoe | 660 Mt Vernon Rd -- Frankfort, KY 40601 | | Letter sent re: objections to project; | SL | Susan spoke to Chris via phone and acknowledged letter; follow-up Q and A session scheduled for January 23 in Peaks Mill. |
| 1/5/07 | Susan Knoll | 2934 Virginia Street -- Houston, TX 77098 | 713.304.9898 | Letter sent re: objections to project; | SL | Susan sent email 1/8/07 acknowleding receipt of concerns. Sent copy of email to Linda Bridwell on 1/7/07. |

**Open House Letter Feedback re:**
**Water Supply Project**
**(Revised 01/30/07)**

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| 1/10/07 | Chris Schimmoeller | | | Called re: 1/23 session. | SL | Left message for Chris re: sign-in sheets, etc. |
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| 1/11/07 | Dr. Baumann | King Lane | 502.484.3020 | Dr. Baumann has had several neighbors indicate concerns about King Lane being part of the route, because the gravel county road also serves as their driveway. He said he would offer his property as an alternative because construction would not bother him. He did ask that we keep him posted on the project and let him know about what kind of compensation would be given for gaining access to private property for the project. His farm is 305 acres. He has no objections to the project. | SL | S. Lancho spoke to Dr. Baumann via phone, after Mayor Wotier indicated Dr. Baumann had questions. |
| 1/16/07 | Mark Schimmoeller | 852 Gregory Woods Road | 502.227.4241 | S. Lancho received letter dated 12/27/06 via e-mail from customer service center today that expresses concerns about project and indicates phone calls not returned. | SL | Followed up with packet of information about project on January 8, 2007. Called and left message for Mr. Schimmoeller on 1/16/07, acknowledging letter, indicating packet had been sent, reminding him of 1/23/07 event and asking him to call if he had further questions. |
| 1/22/07 | Magistrate Ira Fannin | | 502.330.4494 | Called re: 1/23 meeting. Is ill and probably won't attend. Has concerns about project. Believes if treatment plant is in Owen County then waterlines should be, too. Does not favor Southern route due to number of people affected, in his view. Recommends route that would mostly cover Owen County, not Franklin County. Has more questions about project and wishes to speak to Linda. | SL | Shared information about project; referred to Linda for additional followup. |
| 1/22/07 | Thomas Kincaid | Mailing address: 519 Greenup Avenue Frankfort, KY 40601-2048 | 502.875.1659 | Mr. Kincaid owns property at 10165 Hwy 127 South in Owen County and believes he will be affected by all of the three routes. He requested that he receive an aerial photo of the project relative to his area. He spoke with Rich Svindland at a recent open house and aerial photos were referenced. He was impressed with Rich's knowledge of the project, etc. | SL | Susan to send note to Rich about aerial photos and follow up with Mr. Kincaid later this week. She indicated that another Q and A will be held in Peaks Mill on 1/23, but Mr. Kincaid is not able to attend. A letter and aerial photo printout was mailed to Mr. Kincaid on 1/30. |
| 1/30/07 | Derron Rambo | 314 W 2nd Street Frankfort, K | 502-682-2726 | Derron is the Frankfort and Franklin County Emergency Management Director and called to introduce himself and learn more about the project, since the project's construction and operation could at some point impact his team. | SL | Susan called Derron back to provide general information about the project and will forward additional information to him via e-mail, including a list of contact names for the project and the company. |
| 1/26/07 | Jared Cunningham | University of Kentucky landsc | 270.875.0336 | Called re: Owen County Chamber's 2020 vision plan. Would like more information re: water supply project to consider for 2020 land use plan he is working on. | | |

**Open House Letter Feedback re:**
**Water Supply Project**
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| 1/29/07 | Dara Carlisle and Patrick Kenn | 1880 Kays Branch Road Monterey, KY 40359 | | Letter to inform KAW that they will fight any condemnation proceedings for easements on land for water supply line. Believe waterline is bad choice for numerous reasons. | SL | |
| 1/29/07 | Chris Schimmoeller and Joel D | 660 Mount Vernon Road in Frankfort, KY | | Letter thanking KAW for hosting the additional meeting in Peaks Mill on January 23. Enclosed map re: Agricultural District in area. | SL | Letter dated Feb. 6 acknowleding receipt of map and letter. |
| 2/13/07 | Teddy Greathouse | Clem Crest Farm | 859-621-6872 | Just received letter about waterine project and has a few general questions. | Yes | Received first mailing but has not received second mailing. Susan will send mailing to 1622 Moores Mill Road in Midway, 40347. She also gave him her direct phone number and the new website address. He also provided info on another farm owner who has questions -- Jimmy and Dicky Mucle on Woodlake/Stamping Ground Road and Leestown Road. |
| 2/13/07 | Robert Brady | 4701 Georgetown Road, Lexington | 621-6493 | Asked for you to call | Yes, Susan Lancho | Has questions about how project will impact property. The widening of US 25 is already impacting his front yard. |
| 2/13/07 | Joan Littrell | 15805 Hwy 127 South, Owenton KY | 502-484-0265 | Call after 4:00 p.m. | SL | River cliff runs along both of our farms, and they do not want any impact from project on this property, which is near Owen/Franklin County line. Has property that is for sale and does not want it impacted. Had questions about location of intake and treatment plant site. |
| 2/13/07 | Julia Swords | 2596 Ironworks Rd. | 502-868-6144 | Received letter on water project, but has a question about where line will run by her house. | Yes, Susan Lancho | Lives on 10 acres -- has created wildlife sanctuary and has several mature trees. There is also a spring-fed pond and an underground spring. Has a variety of wildlife on property. This section of road is on the Bluegrass Tours route. Alerted us to new oak tree planting on farm across the street (Summerwind Farm). Can we put underpass for wildlife? |
| 2/14/07 | Mike Switzer | mswitzer@insightbb.com | by email | Asked for detail re waterline route | SL | 2/14- Indicated more specific detail not yet available; Sent southern route map. |
| 2/21/07 | Mike Switzer | mswitzer@insightbb.com | by email | Expressed concern that definitive route information not yet available. Wants to know when details will be available | SL | Spoke with Mr. Switzer explaining nature of process and status of project. He wants more definitive information. |
| 2/14/07 | junietillett@bellsouth.net | | By email | Asked for detail re waterline route | SL | Indicated preliminary info is available; more specific alignment not yet determined. |
| 2/14/07 | Carol Moore | 605 Indian Jack Rd. | 502-682-3143 | Wants information on water project in Franklin County | Yes, Susan Lancho | Portion of Indian Gap Road has slipped during rainstorm. Blacktop may seem stable now, but may slide again during rainstorm. May be spring underneath road (DOT may have record of road slipping in area). Road stability may be questionable in the area. From Peaks Mill end, about 2,000 to 2,500 feet coming from Indian Gap. Closest to wear Elkhorn Creek gets to Indian Gap Road. Carol used to work at Drinking Water branch. |
| 2/14/07 | Sharon | Ridgeway Trust | 502-348-2372 | Just started receiving mailing on waterline project. Would like to be kept in the loop. Doesn't have a problem with it, but would like to know where the line will end since it looks like it stops at or near her property. Gave us her correct mailing information. | Yes. Valeria called her back. | Correct mailing address is: Ridgeway Trust, c/o Harry L. Seeger, P.O. Box 516, Bardstown, KY 40004. Also gave her website address for future reference. |

**Open House Letter Feedback re:**
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| 2/15/07 | Harry Borders | Ironworks Road in Scott Co. | Sent via email | Asked for more detail re: location of line and timeline of construction | SL | 2/15 - Wrote back indicating precise location not yet known, provided proposed timeline of project., length of feet to be laid each day, etc; |
| 2/16/07 | Joe Palmore | 5105 Rocky Branch Rd. | 859-621-1056 | Please call | SL | Mr. Palmore is extremely concerned about his pond, which is 30 feet from road and has significant amounts of rock around it. He is also concerned about any blasting work, which could create cracks in his pond or the foundation of his home, which is only 2 years old. Also, he has three sink holes on his property and is concerned that blasting could open them. |
| 2/19/07 | Kenneth Ware | 1045 Cane Run Rd. | 502-863-1460 | Other numbers: 868-0787; 859.983-0667 | SL | Has ponds close to road as well as drilled wells. Owns property at corner of Iron Works and Cane Run. Has concerns about blasting work. Would prefer that line not go on his property because it will devalue property. Existing Kentucky American Water, 36-inch line that is only one foot in depth. Interested in environmental issues related to disturbed soil in terms of livestock. Livestock and horses on property. Has signficant rock wall on property -- more than 1/4 of a mile on property. Will do whatever it takes to keep it off of his property. He is not opposed to project but eventually wants to sell property in sections and says the waterline on property would devalue it. Will hire an attorney if necessary. |
| 2/19/07 | Paul Harnice | 968 Emeness Rd., Frankfort, KY | 502-875-6260 (work) | Wants more information on southern route and possible impact on property he owns. | SL | Called Mr. Harnice and followed up with him by e-mail. Specifics of route not determined yet. |
| 2/19/07 | Gil Dunn | Berea Road | Sent via email | Asked for more detailed map | SL | Indicated more specific information not yet available; still in preliminary phase |
| 2/19/07 | Brian DeMers | | Sent via email | Asked for more detail re: location of line | SL | Indicated more specific information not yet available; still in preliminary phase |
| 2/19/07 | L. Michael Owens | Cobra Farm | Sent via email | Asked about detail of waterline route at Newtown Pike end, impact to farm. | SL | 2/21 - Wrote back indicating known information about tie-in near Newtown Pike. |
| 2/22/07 | Shelley and Garnett Sweeney | Wingate Farm on south corner of 460 and 1685 in Frankling county | Sent via email | Concerned about impact on property -- fence, spring, springhouse; suggested we stay on north side of IronWorks. | | |
| 2/22/07 | Steve Marcal | Dept. of Fish and Wildlife | 502-564-4957 | Receive letter saying waterline doesn't run adjacent or through his property, but says map shows that it does. Would like to talk to someone about this. | SL | Attempted to return call on 12/26 at 12:34 p.m. -- no answer. |
| 2/23/07 | Beulah Downey | | 502-352-6466 | First, there's a survey truck parked in her drivway and they didn't ask for permission. Secondly, she doesn't want anything built across the road from her house because it'll destroy the beauty of the land. Also she won't benefit from it so she doesn't want it. Wants to talk to someone about this. | SL | Left message on 2/26 at 12:37 p.m. on voicemail machine. Left Susan's direct contact information. |
| 2/26/07 | James Mucci | | 502-695-1304 | Called asking for Linda Bridwell. Says they received a letter dated February 12 on February 23 and was sent to wrong address. Says PVA has no problem sending tax bill to right address so they don't know why PVA would give us wrong address. They want to talk about water line running near their property. | SL | Called on 2/28 at 10:04 a.m.; left message on machine asking for follow-up call so we can correct address information.; left message on 3/9 on voicemail (resident had called again on 3/8). |

**Open House Letter Feedback re:**
**Water Supply Project**
**(Revised 01/30/07)**

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| 2/26/07 | Pat Badgett | | 800-928-1601 and by email | Century 21 Simpson and Associates | SL | Asked about 6000 Rocky Branch Road. Can we get water service to this address? Doesn't currently have service. Susan called back and shared that this area is served by Peaks Mill Water District. If Peaks Mill Water District is in need of water in future, we may be able to assist the district. Would need to go through district, however, not KAW. |
| 3/2/07 | Nick Calardo | Cull Pepper Farm in Owen Co | by email | Wants to know when new waterlines are coming | SL | Referred to Owenton office; inquiring about Owen Co. project, not water supply project. |
| 3/8/07 | Helen Duer | 2582 Ironworks Road . Georgetown, KY | 502-863-6742 | Wants to talk about project going in front of her property. | SL | Owns Peninsula Farm. Cell phone: 533-6093; did not receive letter. Mailing address is P.O. Box 11786, Lexington, KY 40578; already has Georgetown water lines going through property and does not want ours going through, as well. Fenceline sits back farther than what would be normal, so we need to know that getting outside the fenceline does not mean we are in easement/right of way. |
| 3/8/07 | Thomas Kincaid | Frankfort, KY | 502.875.1659 | | SL | Followed up with Mr. Kincaid re: energy |
| 3/12/07 | Ann Wesley Mays | Switzer | 502-695-4068 | Question about water line to treatment plant that will run through Switzer. | | Called Ms. Mays on 3/12. She is concerned about impact of route on North Fork Baptist Church on Route 1262. There is a church sign that could be in the way as well as a cemetery. Would like a follow-up call when more definite route is known. |
| 3/8/07 | Jim and Katherine Mucci | 4686 W Leestown Road . Mid | 5026951304 | Requested packet | | 3/14 - Left message on answering machine. Sent letter on March 15 re: status of project, website, etc. |
| 3/26/07 | Peggy Greathouse | | 846-4838. | Expressed concerns to sister-in-law, Gina Greathouse. | SL | Ms. Greathouse has concerns about future subdivision of property if waterlines restrict construction on property, etc. Agrees area needs more water but wonders if more can be done thru conservation. Isn't there a better route? Had bad experience with Columbia Gas project in past -- says they did not do what they said they would do. Action: Susan asked Brent Tippey to follow up with her. |
| 3/27/07 | Clara Fenger | 4904 Iron Works Road Georgetown, KY | By email | Said she is along route but didn't get information. Has concerns re: impact on horses during construction | SL | 3/27 - Wrote back re: communications to date; forwarded copies of correspondence. Asked for address to make sure she received future correspondence. |
| 3/28/07 | Church Saufley | 502-560-1587 | by email | Called call center to obtain info about project; owns land on Elkhorn. Requested map. Said he requested info on 2/27 but no record of call or email found. | SL | Wrote back to Mr. Saufley on 4/9 providing information about KAW desire to minimize impact to Elkhorn and other sensitive areas along route. Provided website information with preliminary map; received followup email from him indicating his property is not affected but still concerned that project will cause more growth in Lexington that will stress the Elkhorn. |
| | Steve Price | 167 Rucker Avenue in Georgetown, KY | | Packet of information received with news clippings and other background information on water issues. Suggested roof-water resource and dry septic waste disposal to address water issue. | SL | Sent letter on April 2 acknowledging receipt of materials. |

**Open House Letter Feedback re:**
**Water Supply Project**
**(Revised 01/30/07)**

| | | | | | | |
|---|---|---|---|---|---|---|
| 4/5/07 | Sandra Ostermeier | 4743 Ironworks Rd. Georgetown, KY 40324-9490 | 502-570-98252 | Just returned from extended stay in Florida and has found out about project. Feels no real time given for input on the project and says having open houses around the holidays not acceptable. She feels residents should have been give 6-12 months to comment on the project. Also says surveyors need her permission before coming on to her property. | VC | Called Ms. Ostermeier on 4-5 and informed her about open houses and follow up meetings with residents. Also talked about correspondence sent out during the entire process. She acknowledged receiving information. Still feels additional time should have been given for input from residents. Also feels transportation dept. should be involved with project so that Ironworks Road can be widened at the same time waterline is put in. |
| 4/6/07 | Julie Palmore | Rocky Branch Road in Frankf | By email | Requested more detailed map of project. Asked for timeframe for meeting with engineers. | SL | Wrote back on 4/9 re: preliminary nature of map; offered to have Brent Tippey follow up with her. |
| 4/10/07 | Julie Palmore | Rocky Branch Road in Frankf | By email | Appreciated reply; said PSC staff person told them they should hire a lawyer and join CAWS. | SL | |
| 4/19/07 | Mrs. Felgendreher | | by email | | BT | Brent Tippey followed up by email re: letter to KAW re: surveyors in area. Requested feedback re: scheduling a meeting to discuss concerns about project's impact on her farm |
| 5/8/07 | Thomas Kincaid | Frankfort, KY | 502.875.1659 | Called to determine if power source for plant had been determined and what kinds of lines would be needed. | SL | Indicated that electrical service provider had not been determined; it was not believed that large towers would be needed at plant. Would continue to keep him apprised of project's progress. |
| 5/15/07 | Susan Knoll | 2947 Rocky Branch Road in S | by email | Forwarded report by Bluestone Geologic indicating its opinion re: impact waterline project would have on her farm. | SL | Sent email on 5/15 acknowleding receipt and that information would be forwarded to project team. Also restated opposition to project. |

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**Witness:** **Linda C. Bridwell**

27. Refer to Direct Testimony of Linda Bridwell, Table 4, "Annual Operation and Maintenance Costs New Water Treatment Plant – Pool 3 of Kentucky River."

    a. Provide the workpapers and show the calculations that Kentucky-American used to develop its projections of the annual operational and maintenance costs in the column entitled "Total."

    b. State all assumptions that Kentucky-American used to develop its projections of the total annual operational and maintenance costs in the Total column.

    c. Describe how the annual operational and maintenance costs in the Total column are allocated between Kentucky-American and the BWSC. This description should include all workpapers, show all calculations, and state all assumptions that Kentucky-American used to develop the cost allocations.

    d. A note to Table 3 states that "no costs for disposal have been included as KAW intends to apply for beneficial re-use on adjacent KAW property similar to RRS and KRS operation." Provide estimates of the disposal costs if Kentucky-American's re-use proposal is allowed. This response should include all workpapers, show all calculations, and state all assumptions that Kentucky-American used to develop the disposal cost estimates.

    e. List and describe each disposal alternative to beneficial re-use that Kentucky-American has considered. This description should include a cost estimate for each alternative and include all workpapers, show all calculations, and state all assumptions used to develop the cost estimates.

**Response:**

a. Please see the attached.
b. Please refer to the workpapers attached in response to part a of this same data request. Security costs were estimated based on ADT monitoring currently utilized based on other American Water treatment plant monitoring by ADT. Depreciation expenses were taken from the financial report attached in response to Item 9 of the Attorney General's First Data Request in this same case.

c. The costs were allocated strictly on an 80/20 split for costs directly at the plant including staff at the plant, power costs, general maintenance expenses, chemical costs, security costs, and depreciation. Additionally, KAW assumed that Water Quality Supervision, Maintenance Supervision, and Administrative support and supervision costs for the plant would be allocated to the plant from existing personnel and therefore no additional increase to the overall costs to KAW customers. KAW assumed that the BWSC would contribute 20% of the costs allocated to the plant for that supervision. KAW also assumed that the portion of the capital owned by the BWSC would not be subject to property taxes, and thus not allocated to the BWSC but reduced overall.

d. Please refer to the response to Item 15 of this same data request.

e. KAW has only reviewed beneficial re-use and off-site disposal as described in response to Item 15 of this same data request.

Annual Operation and Maintenance Costs
New Water Treatment Plant - Pool 3 of Kentucky River
Kentucky American Water
March, 2007

| | | | | |
|---|---|---|---|---|
| **Labor Costs** | | | | |
| | Number | Cost/Year | Total | |
| Supervisor - Salary | 1 | $55,000 | $55,000 | Top of 1st quartile of salary band |
| Benefits/Overhead/Taxes | | $35,750 | $35,750 | 57% rate, approximately $15 per hour |
| Operators | 4 | $43,680 | $174,720 | $21/hour rate |
| Benefits/Overhead/Taxes | | $28,392 | $113,568 | 43% rate, approximately $9 per hour |
| Maintenance/Relief Operator | 2 | $43,680 | $87,360 | $21/hour rate |
| Benefits/Overhead/Taxes | | $28,392 | $56,784 | 43% rate, approximately $9 per hour |
| Water Quality Supervision | | | | |
| Maintenance Supervision | | | | |
| *Administrative support/supervision* | | | | |
| **Sub-Total** | | | $523,182 | |
| | | | | |
| **Power Costs** | Number | Cost/Month | Total | |
| **Treatment Plant/Raw Water Pump Station** | | | | |
| Monthly costs at 6 mgd | 12 | $39,898 | $478,772 | Owen Electric Cooperative LPC2 Rate, 1426 KW |
| Monthly costs at 20 mgd | 0 | $69,138 | $0 | Owen Electric Cooperative LPC2 Rate, 2552 KW |
| **Booster Station** | | | | |
| Monthly costs at 6 mgd | 12 | $9,116 | $109,388 | Kentucky Utilities LP Rate, 371 KW |
| Monthly costs at 20 mgd | 0 | $31,948 | $0 | Kentucky Utilities LP Rate, 1308 KW |
| **Sub-Total** | | | $588,159 | |
| | | | | |
| **General Maintenance** | | | | |
| Transmission Mains | | | | |
| Valve Operations/Signs & Markers/Transportation | | | $60,000 | |
| Plant/Booster Station | | | | |
| Repair Parts, Grounds and Maintenance, Sampling | | | $300,000 | |
| **Sub-Total** | | | $360,000 | |
| | | | | |
| **Chemical Costs** | MGD | Cost/MGD | | |
| | 2190 | 70 | $153,300 | Based on KAW Chemical Feed Costs from Dillard |
| **Sub-Total** | | | $153,300 | |
| | | | | |
| **Security Monitoring** | 12 | $25,000 | $300,000 | |
| | | | | |
| **Depreciation** | | | $2,943,666 | (Jim Harrison Report) |
| | | | | |
| **Taxes** | | | $1,156,649 | |
| | | | | |
| | | | $6,024,957 | |

Note: Residuals Costs are included in plant operations, no costs for disposal have been included as KAW intends to apply for beneficial re-use on adjacent KAW property similar to RRS and KRS operation.
Water Quality, Maintenance and Administrative support would come from current KAW operations and would not represent any increase to KAW's customers

Annual Operation and Maintenance Costs
New Water Treatment Plant - Pool 3 of Kentucky River
Kentucky American Water
March, 2007

| | | | | KAW | BWSC |
|---|---|---|---|---|---|
| **Labor Costs** | Number | Cost/Year | Total | | |
| Supervisor - Salary | 1 | $55,000 | $55,000 | $44,000 | $11,000 |
| Benefits/Overhead/Taxes | | $35,750 | $35,750 | $28,600 | $7,150 |
| Operators | 4 | $43,680 | $174,720 | $139,776 | $34,944 |
| Benefits/Overhead/Taxes | | $28,392 | $113,568 | $90,854 | $22,714 |
| Maintenance/Relief Operator | 2 | $43,680 | $87,360 | $69,888 | $17,472 |
| Benefits/Overhead/Taxes | | $28,392 | $56,784 | $45,427 | $11,357 |
| Water Quality Supervision | | $24,000 | $24,000 | | $4,800 |
| Maintenance Supervision | | $24,000 | $24,000 | | $4,800 |
| Administrative support/supervision | | $49,200 | $49,200 | | $9,840 |
| **Sub-Total** | | | $620,382 | $418,546 | $124,076 |
| | | | | | |
| **Power Costs** | Number | Cost/Month | Total | | |
| **Treatment Plant/Raw Water Pump Station** | | | | | |
| Monthly costs at 6 mgd | 12 | $39,898 | $478,772 | $383,017 | $95,754 |
| Monthly costs at 20 mgd | 0 | $69,138 | $0 | $0 | $0 |
| **Booster Station** | | | | | |
| Monthly costs at 6 mgd | 12 | $9,116 | $109,388 | $87,510 | $21,878 |
| Monthly costs at 20 mgd | 0 | $31,948 | $0 | $0 | $0 |
| **Sub-Total** | | | $588,159 | $470,528 | $117,632 |
| | | | | | |
| **General Maintenance** | | | | | |
| Transmission Mains | | | | | |
| Valve Operations/Signs & Markers/Transportation | | | $60,000 | $48,000 | $12,000 |
| Plant/Booster Station | | | | | |
| Repair Parts, Grounds and Maintenance, Sampling | | | $300,000 | $240,000 | $60,000 |
| **Sub-Total** | | | $360,000 | $288,000 | $72,000 |
| | | | | | |
| **Chemical Costs** | MGD | Cost/MGD | | | |
| | 2190 | 70 | $153,300 | $122,640 | $30,660 |
| **Sub-Total** | | | $153,300 | $122,640 | $30,660 |
| | | | | | |
| **Security Monitoring** | 12 | $25,000 | $300,000 | $240,000 | $60,000 |
| | | | | | |
| **Depreciation** | | | $2,943,666 | $2,354,933 | $588,733 |
| | | | | | |
| **Taxes** | | | $1,156,649 | $925,319 | $0 |
| | | | | | |
| | | | $6,122,157 | $4,819,965 | $993,101 |

Note: Residuals Costs are included in plant operations, no costs for disposal have been included as KAW intends to apply for beneficial re-use on adjacent KAW property similar to RRS and KRS operation.

Water Quality, Maintenance and Administrative support would come from current KAW operations and would not represent any increase to KAW's customers

Estimate of Annual Power Cost for Intermediate Booster Pump Station

Enter No. of Months at 20 MGD 3

| Rate Name | Cost Per Month | | Cost of 6 MGD Power | Cost of 20 MGD Power | Total Annual Cost | Comments |
|---|---|---|---|---|---|---|
| | at 6 MGD | at 20 MGD | | | | |
| KU General Service | $ 14,325.37 | $ 50,479.96 | $ 128,928 | $ 151,440 | **$ 280,368** | Same as RRS & Jacobson |
| KU LCI-TOD | $ 7,301.46 | $ 25,438.17 | $ 65,713 | $ 76,315 | **$ 142,028** | Same as KRS for > 5000 KW. |
| KU - LP | $ 9,115.65 | $ 31,947.73 | $ 82,041 | $ 95,843 | **$ 177,884** | For 200 to 5000 KW |

Enter No. of Months at 20 MGD 2

| Rate Name | Cost Per Month | | Cost of 6 MGD Power | Cost of 20 MGD Power | Total Annual Cost | |
|---|---|---|---|---|---|---|
| | at 6 MGD | at 20 MGD | | | | |
| KU General Service | $ 14,325.37 | $ 50,479.96 | $ 143,254 | $ 100,960 | **$ 244,214** | Same as RRS & Jacobson |
| KU LCI-TOD | $ 7,301.46 | $ 25,438.17 | $ 73,015 | $ 50,876 | **$ 123,891** | Same as KRS for > 5000 KW. |
| KU - LP | $ 9,115.65 | $ 31,947.73 | $ 91,157 | $ 63,895 | **$ 155,052** | For 200 to 5000 KW |

Enter No. of Months at 20 MGD 1

| Rate Name | Cost Per Month | | Cost of 6 MGD Power | Cost of 20 MGD Power | Total Annual Cost | |
|---|---|---|---|---|---|---|
| | at 6 MGD | at 20 MGD | | | | |
| KU General Service | $ 14,325.37 | $ 50,479.96 | $ 157,579 | $ 50,480 | **$ 208,059** | Same as RRS & Jacobson |
| KU LCI-TOD | $ 7,301.46 | $ 25,438.17 | $ 80,316 | $ 25,438 | **$ 105,754** | Same as KRS for > 5000 KW, |
| KU - LP | $ 9,115.65 | $ 31,947.73 | $ 100,272 | $ 31,948 | **$ 132,220** | For 200 to 5000 KW |

Enter No. of Months at 20 MGD 0

| Rate Name | Cost Per Month | | Cost of 6 MGD Power | Cost of 20 MGD Power | Total Annual Cost | |
|---|---|---|---|---|---|---|
| | at 6 MGD | at 20 MGD | | | | |
| KU General Service | $ 14,325.37 | $ 50,479.96 | $ 171,904 | $ - | **$ 171,904** | Same as RRS & Jacobson |
| KU LCI-TOD | $ 7,301.46 | $ 25,438.17 | $ 87,618 | $ - | **$ 87,618** | Same as KRS for > 5000 KW, |
| KU - LP | $ 9,115.65 | $ 31,947.73 | $ 109,388 | $ - | **$ 109,388** | For 200 to 5000 KW |

**Power Requirements**
**at Intermediate Pump Station (6 MGD)**

**Revised 3/20/07**

| Load No. | Description | No. of phase | Voltage | Hp | Watts | Amps | KW | %eff | pf | kVa |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | One 10 MGD Booster at 6 MGD | 3 | 4,160 | 400 0 | 317,035 | 44 | 317 0 | 0 96 | 1.00 | 317.0 |
| 2 | One 10 MGD Booster at 0 MGD | 3 | 4,160 | - | - | - | - | 0 96 | 1 00 | 0 0 |
| 3 | 1/2 of the Ventilation Fans in Pump Rm | 3 | 480 | 10 0 | 8,314 | 10 | 8.3 | 0.96 | 1 00 | 8.3 |
| 4 | Heat Pump for MCC Room | 3 | 480 | 10 5 | 8,314 | 10 | 8 3 | 0 96 | 1.00 | 8.3 |
| 5 | Full Feed on 480:240V XFMR | 1 | 240 | 22.0 | 17,280 | 72 | 17 3 | 0.96 | 1 00 | 29 9 |
| 6 | 1/4 Heaters in Building | 3 | 480 | 25.0 | 19,953 | 24 | 20.0 | 0.96 | 1.00 | 20.0 |
| | | | | | 370,895 | 160 | 371 | | | 383 5 |

| Rate Name | Cost Per Month | |
|---|---|---|
| KU General Service | $ 14,325.37 | same as RRS |
| KU LCI-TOD | $ 7,301 46 | same as KRS for >5000KW |
| KU - LP | $ 9,115.65 | for 200 KW to 5000 KW service |

Power Requirements
at Intermediate Pump Station (20 MGD)

Revised 3/20/07

| Load No. | Description | No. of phase | Voltage | Hp | Watts | Amps | KW | %eff | pf | kVa |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | One 10 MGD Booster at full speed | 3 | 4,160 | 800 0 | 626,864 | 87 | 626 9 | 0 96 | 1 00 | 626 9 |
| 2 | One 10 MGD Booster at full speed | 3 | 4,160 | 800 0 | 626,864 | 87 | 626 9 | 0.96 | 1 00 | 626 9 |
| 3 | 1/2 of the Ventilation Fans in Pump Rm | 3 | 480 | 10 0 | 8,314 | 10 | 8.3 | 0 96 | 1 00 | 8 3 |
| 4 | Heat Pump for MCC Room | 3 | 480 | 10 5 | 8,314 | 10 | 8 3 | 0 96 | 1 00 | 8 3 |
| 5 | Full Feed on 480:240V XFMR | 1 | 240 | 22 0 | 17,280 | 72 | 17.3 | 0.96 | 1.00 | 29 9 |
| 6 | 1/4 Heaters in Building | 3 | 480 | 25.0 | 19,953 | 24 | 20.0 | 0.96 | 1.00 | 20.0 |
| | | | | | 1,307,589 | 290 | 1,308 | | | 1320 2 |

| Rate Name | Cost Per Month | |
|---|---|---|
| KU General Service | $ 50,479 96 | same as RRS |
| KU LCI-TOD | $ 25,438.17 | same as KRS for >5000KW |
| KU - LP | $ 31,947 73 | for 200 KW to 5000 KW service |

**Power Requirements**
**at Intermediate BPS (30 MGD)+**

**Revised 3/20/07**

| Load No. | Description | No. of phase | Voltage | Hp | Watts | Amps | KW | %eff | pf | kVa |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | One 10 MGD Booster at full speed | 3 | 4,160 | 1,000.0 | 778,176 | 108 | 778 2 | 0 96 | 1 00 | 778 2 |
| 2 | Two 10 MGD Boosters at full speed | 3 | 4,160 | 2,000 0 | 1,556,352 | 216 | 1,556 4 | 0 96 | 1 00 | 1556 4 |
| 3 | 1/2 of the Ventilation Fans in Pump Rm | 3 | 480 | 10 0 | 8,314 | 10 | 8 3 | 0.96 | 1 00 | 8 3 |
| 4 | Heat Pump for MCC Room | 3 | 480 | 10 5 | 8,314 | 10 | 8 3 | 0 96 | 1 00 | 8.3 |
| 5 | Full Feed on 480.240V XFMR | 1 | 240 | 22 0 | 17,280 | 72 | 17 3 | 0 96 | 1.00 | 29 9 |
| 6 | 1/4 Heaters in Building | 3 | 480 | 25.0 | 19,953 | 24 | 20.0 | 0.96 | 1.00 | 20.0 |
| | | | | | 2,388,388 | 440 | 2,388 | | | 2401 0 |

| Rate Name | Cost Per Month | | |
|---|---|---|---|
| KU General Service | $ | 92,196 80 | same as RRS |
| KU LCI-TOD | $ | 46,365 15 | same as KRS for >5000KW |
| KU - LP | $ | 58,292 44 | for 200 KW to 5000 KW service |
| | | | |
| OEC Sch II Large Power | $ | 94,258 16 | |
| OEC LPC1 | $ | 67,885 38 | |
| OEC LPC2 | $ | 64,893 86 | |

**Power Requirements**
**at KRS (28 MGD)**

**Revised 3/15/07**

| Load No. | Description | No. of phase | Voltage | Hp | Watts | Amps | KW | %eff | pf | kVa |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Three Raw Water Pump | 3 | 4,160 | 3,750.0 | 2,918,159 | 405 | 2,918.2 | 0.96 | 1.00 | 2918.2 |
| 2 | Three High Service Pump | 3 | 4,160 | 2,400.0 | 1,866,181 | 259 | 1,866.2 | 0.96 | 1.00 | 1866.2 |
| 3 | One Rapid Mix Motor | 3 | 480 | 100.0 | 78,150 | 94 | 78.2 | 0.96 | 1.00 | 78.2 |
| 4 | Ten Clarifer Drives | 3 | 480 | 50.0 | 39,075 | 47 | 39.1 | 0.96 | 1.00 | 39.1 |
| 5 | Ten Metering Pumps | 1 | 110 | 5.0 | 3,960 | 36 | 4.0 | 0.96 | 1.00 | 6.9 |
| 6 | Four Polymer Pumps | 1 | 110 | - | - | - | - | 0.96 | 1.00 | 0.0 |
| 7 | Raw Water Transfer | 3 | 4,160 | 900.0 | 706,122 | 98 | 706.1 | 0.96 | 1.00 | 706.1 |
| 8 | One Thickner | 3 | 480 | 2.0 | 1,663 | 2 | 1.7 | 0.96 | 1.00 | 1.7 |
| 9 | One WasteHolding Tank | 3 | 480 | 5.0 | 4,157 | 5 | 4.2 | 0.96 | 1.00 | 4.2 |
| 10 | SCADA System | 1 | 110 | | 5,000 | 45 | 5.0 | 0.96 | 1.00 | 8.7 |
| 11 | Five Filter Valves | 3 | 480 | 2.5 | 2,494 | 3 | 2.5 | 0.96 | 1.00 | 2.5 |
| 12 | Several HVAC fans | 3 | 480 | 60.0 | 47,389 | 57 | 47.4 | 0.96 | 1.00 | 47.4 |
| 13 | Air Cond for certain areas | 3 | 480 | 15.0 | 12,471 | 15 | 12.5 | 0.96 | 1.00 | 12.5 |
| 14 | Misc Building Load | 1 | 110 | | | - | - | 0.96 | 1.00 | 0.0 |
| 15 | Misc Building Load | 3 | 480 | | 75,000 | 90 | 75.0 | 0.96 | 1.00 | 75.0 |
| | | | | | 5,759,821 | 1,157 | 5,760 | | | 5766.4 |

| Rate Name | Cost Per Month | |
|---|---|---|
| KU General Service | $ 222,327.77 | same as RRS |
| KU LCI-TOD | $ 111,644.49 | same as KRS for >5000KW |
| KU - LP | $ 140,471.79 | for 200 KW to 5000 KW service |
| | | |
| OEC Sch II Large Power | $ 227,284.11 | |
| OEC LPC1 | $ 161,696.18 | |
| OEC LPC2 | $ 152,467.51 | |

Estimate of Annual Power Cost for KAW Pool 3 WTP

Enter No. of Months at 20 MGD 3

| Rate Name | Cost Per Month at 6 MGD | Cost Per Month at 20 MGD | Cost of 6 MGD Power | Cost of 20 MGD Power | Total Annual Cost | Comments |
|---|---|---|---|---|---|---|
| KU General Service | $ 55,053.40 | $ 98,503.09 | $ 495,481 | $ 295,509 | **$ 790,990** | Same as RRS & Jacobson |
| KU LCI-TOD | $ 27,732.41 | $ 49,528.66 | $ 249,592 | $ 148,586 | **$ 398,178** | Same as KRS for > 5000 KW, |
| KU - LP | $ 34,835.92 | $ 62,274.95 | $ 313,523 | $ 186,825 | **$ 500,348** | For 200 to 5000 KW |
| | | | | | | |
| OEC Sch II Large Power | $ 56,288.45 | $ 100,704.75 | $ 506,596 | $ 302,114 | **$ 808,710** | |
| OEC LPC1 | $ 41,108.88 | $ 72,431.56 | $ 369,980 | $ 217,295 | **$ 587,275** | |
| OEC LPC2 | $ 39,897.64 | $ 69,137.78 | $ 359,079 | $ 207,413 | **$ 566,492** | |

Enter No. of Months at 20 MGD 2

| Rate Name | Cost Per Month at 6 MGD | Cost Per Month at 20 MGD | Cost of 6 MGD Power | Cost of 20 MGD Power | Total Annual Cost | |
|---|---|---|---|---|---|---|
| KU General Service | $ 55,053.40 | $ 98,503.09 | $ 550,534 | $ 197,006 | **$ 747,540** | Same as RRS & Jacobson |
| KU LCI-TOD | $ 27,732.41 | $ 49,528.66 | $ 277,324 | $ 99,057 | **$ 376,381** | Same as KRS for > 5000 KW, |
| KU - LP | $ 34,835.92 | $ 62,274.95 | $ 348,359 | $ 124,550 | **$ 472,909** | For 200 to 5000 KW |
| | | | | | | |
| OEC Sch II Large Power | $ 56,288.45 | $ 100,704.75 | $ 562,884 | $ 201,409 | **$ 764,294** | |
| OEC LPC1 | $ 41,108.88 | $ 72,431.56 | $ 411,089 | $ 144,863 | **$ 555,952** | |
| OEC LPC2 | $ 39,897.64 | $ 69,137.78 | $ 398,976 | $ 138,276 | **$ 537,252** | |

Enter No. of Months at 20 MGD 1

| Rate Name | Cost Per Month at 6 MGD | Cost Per Month at 20 MGD | Cost of 6 MGD Power | Cost of 20 MGD Power | Total Annual Cost | |
|---|---|---|---|---|---|---|
| KU General Service | $ 55,053.40 | $ 98,503.09 | $ 605,587 | $ 98,503 | **$ 704,091** | Same as RRS & Jacobson |
| KU LCI-TOD | $ 27,732.41 | $ 49,528.66 | $ 305,056 | $ 49,529 | **$ 354,585** | Same as KRS for > 5000 KW, |
| KU - LP | $ 34,835.92 | $ 62,274.95 | $ 383,195 | $ 62,275 | **$ 445,470** | For 200 to 5000 KW |
| | | | | | | |
| OEC Sch II Large Power | $ 56,288.45 | $ 100,704.75 | $ 619,173 | $ 100,705 | **$ 719,878** | |
| OEC LPC1 | $ 41,108.88 | $ 72,431.56 | $ 452,198 | $ 72,432 | **$ 524,629** | |
| OEC LPC2 | $ 39,897.64 | $ 69,137.78 | $ 438,874 | $ 69,138 | **$ 508,012** | |

Enter No. of Months at 20 MGD 0

| Rate Name | Cost Per Month at 6 MGD | Cost Per Month at 20 MGD | Cost of 6 MGD Power | Cost of 20 MGD Power | Total Annual Cost | |
|---|---|---|---|---|---|---|
| KU General Service | $ 55,053.40 | $ 98,503.09 | $ 660,641 | $ - | **$ 660,641** | Same as RRS & Jacobson |
| KU LCI-TOD | $ 27,732.41 | $ 49,528.66 | $ 332,789 | $ - | **$ 332,789** | Same as KRS for > 5000 KW, |
| KU - LP | $ 34,835.92 | $ 62,274.95 | $ 418,031 | $ - | **$ 418,031** | For 200 to 5000 KW |
| | | | | | | |
| OEC Sch II Large Power | $ 56,288.45 | $ 100,704.75 | $ 675,461 | $ - | **$ 675,461** | |
| OEC LPC1 | $ 41,108.88 | $ 72,431.56 | $ 493,307 | $ - | **$ 493,307** | |
| OEC LPC2 | $ 39,897.64 | $ 69,137.78 | $ 478,772 | $ - | **$ 478,772** | |

**Power Requirements**
**at KAW Pool 3 WTP (6 MGD)**

**Revised 3/15/07**

| Load No. | Description | No. of phase | Voltage | Hp | Watts | Amps | KW | %eff | pf | kVa |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | One Raw Water Pump | 3 | 4,160 | 700.0 | 547,605 | 76 | 547.6 | 0.96 | 1.00 | 547.6 |
| 2 | One High Service Pump | 3 | 4,160 | 700.0 | 547,605 | 76 | 547.6 | 0.96 | 1.00 | 547.6 |
| 3 | One Rapid Mix Motor | 3 | 480 | 20.0 | 15,796 | 19 | 15.8 | 0.96 | 1.00 | 15.8 |
| 4 | Four Flocculators | 3 | 480 | 5.0 | 4,157 | 5 | 4.2 | 0.96 | 1.00 | 4.2 |
| 5 | Five Metering Pumps | 1 | 110 | 2.5 | 1,980 | 18 | 2.0 | 0.96 | 1.00 | 3.4 |
| 6 | Four Polymer Pumps | 1 | 110 | 2.0 | 1,650 | 15 | 1.7 | 0.96 | 1.00 | 2.9 |
| 7 | One Belt Press | 3 | 480 | 30.0 | 24,110 | 29 | 24.1 | 0.96 | 1.00 | 24.1 |
| 8 | One Thickner | 3 | 480 | 2.0 | 1,663 | 2 | 1.7 | 0.96 | 1.00 | 1.7 |
| 9 | One WasteHolding Tank | 3 | 480 | 5.0 | 4,157 | 5 | 4.2 | 0.96 | 1.00 | 4.2 |
| 10 | SCADA System | 1 | 110 | | 10,000 | 91 | 10.0 | 0.96 | 1.00 | 17.3 |
| 11 | Five Filter Valves | 3 | 480 | 2.5 | 2,494 | 3 | 2.5 | 0.96 | 1.00 | 2.5 |
| 12 | Several HVAC fans | 3 | 480 | 60.0 | 47,389 | 57 | 47.4 | 0.96 | 1.00 | 47.4 |
| 13 | Air Cond for certain areas | 3 | 480 | 15.0 | 12,471 | 15 | 12.5 | 0.96 | 1.00 | 12.5 |
| 14 | Misc Building Load | 1 | 110 | | 80,000 | 727 | 80.0 | 0.96 | 1.00 | 138.6 |
| 15 | Misc Building Load | 3 | 480 | | 125,000 | 150 | 125.0 | 0.96 | 1.00 | 125.0 |
| | | | | | 1,426,077 | 1,289 | 1,426 | | | 1494.6 |

| Rate Name | Cost Per Month | |
|---|---|---|
| KU General Service | $ 55,053.40 | same as RRS |
| KU LCI-TOD | $ 27,732.41 | same as KRS for >5000KW |
| KU - LP | $ 34,835.92 | for 200 KW to 5000 KW service |
| | | |
| OEC Sch II Large Power | $ 56,288.45 | |
| OEC LPC1 | $ 41,108.88 | |
| OEC LPC2 | $ 39,897.64 | |

**Power Requirements**
**at KAW Pool 3 WTP (20 MGD)**

**Revised 3/15/07**

| Load No. | Description | No. of phase | Voltage | Hp | Watts | Amps | KW | %eff | pf | kVa |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Two Raw Water Pump | 3 | 4,160 | 1,400.0 | 1,088,005 | 151 | 1,088.0 | 0.96 | 1.00 | 1088.0 |
| 2 | Two High Service Pump | 3 | 4,160 | 1,400.0 | 1,088,005 | 151 | 1,088.0 | 0.96 | 1.00 | 1088.0 |
| 3 | Two Rapid Mix Motor | 3 | 480 | 40.0 | 31,593 | 38 | 31.6 | 0.96 | 1.00 | 31.6 |
| 4 | Four Flocculators | 3 | 480 | 5.0 | 4,157 | 5 | 4.2 | 0.96 | 1.00 | 4.2 |
| 5 | Five Metering Pumps | 1 | 110 | 2.5 | 1,980 | 18 | 2.0 | 0.96 | 1.00 | 3.4 |
| 6 | Four Polymer Pumps | 1 | 110 | 2.0 | 1,650 | 15 | 1.7 | 0.96 | 1.00 | 2.9 |
| 7 | Two Belt Press | 3 | 480 | 60.0 | 47,389 | 57 | 47.4 | 0.96 | 1.00 | 47.4 |
| 8 | Two Thickner | 3 | 480 | 4.0 | 3,326 | 4 | 3.3 | 0.96 | 1.00 | 3.3 |
| 9 | Two WasteHolding Tank | 3 | 480 | 10.0 | 8,314 | 10 | 8.3 | 0.96 | 1.00 | 8.3 |
| 10 | SCADA System | 1 | 110 | | 10,000 | 91 | 10.0 | 0.96 | 1.00 | 17.3 |
| 11 | Five Filter Valves | 3 | 480 | 2.5 | 2,494 | 3 | 2.5 | 0.96 | 1.00 | 2.5 |
| 12 | Several HVAC fans | 3 | 480 | 60.0 | 47,389 | 57 | 47.4 | 0.96 | 1.00 | 47.4 |
| 13 | Air Cond for certain areas | 3 | 480 | 15.0 | 12,471 | 15 | 12.5 | 0.96 | 1.00 | 12.5 |
| 14 | Misc Building Load | 1 | 110 | | 80,000 | 727 | 80.0 | 0.96 | 1.00 | 138.6 |
| 15 | Misc Building Load | 3 | 480 | | 125,000 | 150 | 125.0 | 0.96 | 1.00 | 125.0 |
| | | | | | 2,551,772 | 1,493 | 2,552 | | | 2620.3 |

| Rate Name | Cost Per Month | |
|---|---|---|
| KU General Service | $ 98,503.09 | same as RRS |
| KU LCI-TOD | $ 49,528.66 | same as KRS for >5000KW |
| KU - LP | $ 62,274.95 | for 200 KW to 5000 KW service |
| | | |
| OEC Sch II Large Power | $ 100,704.75 | |
| OEC LPC1 | $ 72,431.56 | |
| OEC LPC2 | $ 69,137.78 | |

## Power Requirements
## at KAW Pool 3 WTP (30 MGD)+

**Revised 3/15/07**

| Load No. | Description | No. of phase | Voltage | Hp | Watts | Amps | KW | %eff | pf | kVa |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Four Raw Water Pump | 3 | 4,160 | 2,400.0 | 1,866,181 | 259 | 1,866.2 | 0.96 | 1.00 | 1866.2 |
| 2 | Four High Service Pump | 3 | 4,160 | 2,400.0 | 1,866,181 | 259 | 1,866.2 | 0.96 | 1.00 | 1866.2 |
| 3 | Two Rapid Mix Motor | 3 | 480 | 40.0 | 31,593 | 38 | 31.6 | 0.96 | 1.00 | 31.6 |
| 4 | Four Flocculators | 3 | 480 | 5.0 | 4,157 | 5 | 4.2 | 0.96 | 1.00 | 4.2 |
| 5 | Five Metering Pumps | 1 | 110 | 2.5 | 1,980 | 18 | 2.0 | 0.96 | 1.00 | 3.4 |
| 6 | Four Polymer Pumps | 1 | 110 | 2.0 | 1,650 | 15 | 1.7 | 0.96 | 1.00 | 2.9 |
| 7 | Three Belt Press | 3 | 480 | 90.0 | 70,668 | 85 | 70.7 | 0.96 | 1.00 | 70.7 |
| 8 | Two Thickner | 3 | 480 | 4.0 | 3,326 | 4 | 3.3 | 0.96 | 1.00 | 3.3 |
| 9 | Two WasteHolding Tank | 3 | 480 | 10.0 | 8,314 | 10 | 8.3 | 0.96 | 1.00 | 8.3 |
| 10 | SCADA System | 1 | 110 | | 10,000 | 91 | 10.0 | 0.96 | 1.00 | 17.3 |
| 11 | Five Filter Valves | 3 | 480 | 2.5 | 2,494 | 3 | 2.5 | 0.96 | 1.00 | 2.5 |
| 12 | Several HVAC fans | 3 | 480 | 60.0 | 47,389 | 57 | 47.4 | 0.96 | 1.00 | 47.4 |
| 13 | Air Cond for certain areas | 3 | 480 | 15.0 | 12,471 | 15 | 12.5 | 0.96 | 1.00 | 12.5 |
| 14 | Misc Building Load | 1 | 110 | | 80,000 | 727 | 80.0 | 0.96 | 1.00 | 138.6 |
| 15 | Misc Building Load | 3 | 480 | | 125,000 | 150 | 125.0 | 0.96 | 1.00 | 125.0 |
| | | | | | 4,131,402 | 1,737 | 4,131 | | | 4199.9 |

| Rate Name | Cost Per Month | |
|---|---|---|
| KU General Service | $ 159,473.85 | same as RRS |
| KU LCI-TOD | $ 80,114.24 | same as KRS for >5000KW |
| KU - LP | $ 100,778.75 | for 200 KW to 5000 KW service |
| | | |
| OEC Sch II Large Power | $ 163,031.90 | |
| OEC LPC1 | $ 116,385.09 | |
| OEC LPC2 | $ 110,168.99 | |

**Power Requirements**
**at KRS (28 MGD)**

**Revised 3/15/07**

| Load No. | Description | No. of phase | Voltage | Hp | Watts | Amps | KW | %eff | pf | kVa |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Three Raw Water Pump | 3 | 4,160 | 3,750.0 | 2,918,159 | 405 | 2,918.2 | 0.96 | 1.00 | 2918.2 |
| 2 | Three High Service Pump | 3 | 4,160 | 2,400.0 | 1,866,181 | 259 | 1,866.2 | 0.96 | 1.00 | 1866.2 |
| 3 | One Rapid Mix Motor | 3 | 480 | 100.0 | 78,150 | 94 | 78.2 | 0.96 | 1.00 | 78.2 |
| 4 | Ten Clarifer Drives | 3 | 480 | 50.0 | 39,075 | 47 | 39.1 | 0.96 | 1.00 | 39.1 |
| 5 | Ten Metering Pumps | 1 | 110 | 5.0 | 3,960 | 36 | 4.0 | 0.96 | 1.00 | 6.9 |
| 6 | Four Polymer Pumps | 1 | 110 | - | - | - | - | 0.96 | 1.00 | 0.0 |
| 7 | Raw Water Transfer | 3 | 4,160 | 900.0 | 706,122 | 98 | 706.1 | 0.96 | 1.00 | 706.1 |
| 8 | One Thickner | 3 | 480 | 2.0 | 1,663 | 2 | 1.7 | 0.96 | 1.00 | 1.7 |
| 9 | One WasteHolding Tank | 3 | 480 | 5.0 | 4,157 | 5 | 4.2 | 0.96 | 1.00 | 4.2 |
| 10 | SCADA System | 1 | 110 | | 5,000 | 45 | 5.0 | 0.96 | 1.00 | 8.7 |
| 11 | Five Filter Valves | 3 | 480 | 2.5 | 2,494 | 3 | 2.5 | 0.96 | 1.00 | 2.5 |
| 12 | Several HVAC fans | 3 | 480 | 60.0 | 47,389 | 57 | 47.4 | 0.96 | 1.00 | 47.4 |
| 13 | Air Cond for certain areas | 3 | 480 | 15.0 | 12,471 | 15 | 12.5 | 0.96 | 1.00 | 12.5 |
| 14 | Misc Building Load | 1 | 110 | | | - | - | 0.96 | 1.00 | 0.0 |
| 15 | Misc Building Load | 3 | 480 | | 75,000 | 90 | 75.0 | 0.96 | 1.00 | 75.0 |
| | | | | | 5,759,821 | 1,157 | 5,760 | | | 5766.4 |

| Rate Name | Cost Per Month | |
|---|---|---|
| KU General Service | $ 222,327.77 | same as RRS |
| KU LCI-TOD | $ 111,644.49 | same as KRS for >5000KW |
| KU - LP | $ 140,471.79 | for 200 KW to 5000 KW service |
| | | |
| OEC Sch II Large Power | $ 227,284.11 | |
| OEC LPC1 | $ 161,696.18 | |
| OEC LPC2 | $ 152,467.51 | |

Kentucky American Water
Mar-07
Estimated Property Tax Assessment

| | | Assessed Value Real Estate | Real Estate Per $100 Value | Tax Due Real Estate | Assessed Value Tangible | Tangible Per $100 Value | Tax Due Tangible | Total Real and Tangible Tax Due |
|---|---|---|---|---|---|---|---|---|
| **Owen County** | | | | | | | | |
| Real Estate | County | $49,289,540 | 0.125000 | 61611.93 | | | | $61,611.93 |
| Real Estate | School | $49,289,540 | 0.540000 | 266163.5 | | | | $266,163.52 |
| Real Estate | Health | $49,289,540 | 0.056000 | 27602.14 | | | | $27,602.14 |
| Real Estate | Library | $49,289,540 | 0.080000 | 39431.63 | | | | $39,431.63 |
| Real Estate | Extension | $49,289,540 | 0.043000 | 21194.5 | | | | $21,194.50 |
| Real Estate | Soil Conservation | $49,289,540 | 0.016000 | 7886.326 | | | | $7,886.33 |
| Tangible | County | | | | $5,061,794 | 0.150000 | 7592.692 | $7,592.69 |
| Tangible | School | | | | $5,061,794 | 0.600000 | 30370.77 | $30,370.77 |
| Tangible | Health | | | | $5,061,794 | 0.056000 | 2834.605 | $2,834.60 |
| Tangible | Library | | | | $5,061,794 | 0.198300 | 10037.54 | $10,037.54 |
| Tangible | Extension | | | | $5,061,794 | 0.075400 | 3816.593 | $3,816.59 |
| Tangible | Soil Conservation | | | | $5,061,794 | 0.000000 | 0 | $0.00 |
| **Total County Tax Estimate** | | | | | | | | $478,542.24 |
| **Franklin County** | | | | | | | | |
| Real Estate | County | $55,591,273 | 0.137000 | 76160.04 | | | | $76,160.04 |
| Real Estate | School | $55,591,273 | 0.518000 | 287962.8 | | | | $287,962.79 |
| Real Estate | Health | $55,591,273 | 0.040000 | 22236.51 | | | | $22,236.51 |
| Real Estate | Library | $55,591,273 | 0.086000 | 47808.49 | | | | $47,808.49 |
| Real Estate | Extension | $55,591,273 | 0.012400 | 6893.318 | | | | $6,893.32 |
| Real Estate | Soil Conservation | $55,591,273 | 0.008000 | 4447.302 | | | | $4,447.30 |
| Tangible | County | | | | $1,586,656 | 0.203000 | 3220.912 | $3,220.91 |
| Tangible | School | | | | $1,586,656 | 0.518000 | 8218.88 | $8,218.88 |
| Tangible | Health | | | | $1,586,656 | 0.040000 | 634.6625 | $634.66 |
| Tangible | Library | | | | $1,586,656 | 0.165100 | 2619.57 | $2,619.57 |
| Tangible | Extension | | | | $1,586,656 | 0.021000 | 333.1978 | $333.20 |
| Tangible | Soil Conservation | | | | $1,586,656 | 0.000000 | 0 | $0.00 |
| **Total County Tax Estimate** | | | | | | | | $460,535.68 |
| **Scott County** | | | | | | | | |
| Real Estate | County | $26,606,672 | 0.062000 | 16496.14 | | | | $16,496.14 |
| Real Estate | School | $26,606,672 | 0.404000 | 107491 | | | | $107,490.96 |
| Real Estate | Health | $26,606,672 | 0.032000 | 8514.135 | | | | $8,514.14 |
| Real Estate | Library | $26,606,672 | 0.058000 | 15431.87 | | | | $15,431.87 |
| Real Estate | Extension | $26,606,672 | 0.014500 | 3857.967 | | | | $3,857.97 |
| Tangible | County | | | | $0 | 0.110000 | 0 | $0.00 |
| Tangible | School | | | | $0 | 0.419000 | 0 | $0.00 |
| Tangible | Health | | | | $0 | 0.032000 | 0 | $0.00 |
| Tangible | Library | | | | $0 | 0.110800 | 0 | $0.00 |
| Tangible | Extension | | | | $0 | 0.024900 | 0 | $0.00 |
| **Total County Tax Estimate** | | | | | | | | $151,791.07 |
| **Fayette County** | | | | | | | | |
| Real Estate | County | $9,546,278 | 0.080000 | 7637.022 | | | | $7,637.02 |
| Real Estate | School | $9,546,278 | 0.541000 | 51645.36 | | | | $51,645.36 |
| Real Estate | Health | $9,546,278 | 0.028000 | 2672.958 | | | | $2,672.96 |
| Real Estate | LexTran | $9,546,278 | 0.060000 | 5727.767 | | | | $5,727.77 |
| Real Estate | Extension | $9,546,278 | 0.003100 | 295.9346 | | | | $295.93 |
| Real Estate | Soil Conservation | $9,546,278 | 0.000400 | 38.18511 | | | | $38.19 |
| Tangible | County | | | | $0 | 0.099000 | 0 | $0.00 |
| Tangible | School | | | | $0 | 0.541000 | 0 | $0.00 |
| Tangible | Health | | | | $0 | 0.028000 | 0 | $0.00 |
| Tangible | LexTran | | | | $0 | 0.060000 | 0 | $0.00 |
| Tangible | Extension | | | | $0 | 0.003400 | 0 | $0.00 |
| Tangible | Soil Conservation | | | | $0 | 0.000000 | 0 | $0.00 |
| **Total County Tax Estimate** | | | | | | | | $68,017.23 |
| | | | | | | | | $1,158,886.22 |

| Item | Total Project Costs 20 MGD at 90% Design (*) | Owen County Real Estate | Owen County Tangible | Franklin County Real Estate | Franklin County Tangible | Scott County Real Estate | Scott County Tangible | Fayette County Real Estate | Fayette County Tangible | Total |
|---|---|---|---|---|---|---|---|---|---|---|
| Lake, River and Other Intakes | $1,223,649 (*) | | | $1,223,649 | | | | | | $1,223,649 |
| Raw Water Pumping Station | | | | | | | | | | |
| Structure | $8,443,175 (*) | | | $8,443,175 | | | | | | $8,443,175 |
| Electric Pumping Equipment | $1,468,378 (*) | | | | $0 | | | | | $0 |
| Supply Mains | $1,101,284 | | | $1,101,284 | | | | | | $1,101,284 |
| Water Treatment Plant | (*) | | | | | | | | | |
| Structure | $48,798,951 (*) | $48,798,951 | | | | | | | | $48,798,951 |
| Equipment | $10,573,141 | | $0 | | | | | | | $0 |
| Electric Pumping Equipment | $5,061,794 (*) | | $5,061,794 | | | | | | | $5,061,794 |
| Finished Water Main | $73,234,135 (*) | $382,453 | | $37,254,027 | | $26,198,005 | | $9,399,651 | | $73,234,135 |
| Transmission Storage | $2,426,112 (*) | | | $2,426,112 | | | | | | $2,426,112 |
| Transmission Water Pumping Station | | | | | | | | | | |
| Structure | $3,738,516 (*) | | | $3,738,516 | | | | | | $3,738,516 |
| Electric Pumping Equipment | $1,586,656 (*) | | | | $1,586,656 | | | | | $1,586,656 |
| Land | | | | | | | | | | |
| Intake and Water Treatment Plant | $823,378 | | | $823,378 | | | | | | $823,378 |
| Transmission Storage and Pumping | $102,171 | $102,171 | | | | | | | | $102,171 |
| Finished Water Main | $1,142,393 | $5,966 | | $581,132 | | $408,667 | | $146,627 | | $1,142,393 |
| TOTAL | $159,723,734 | $49,289,540 | $5,061,794 | $55,591,273 | $1,586,656 | $26,606,672 | $0 | $9,546,278 | $0 | $147,682,214 |
| | | | | | | | | | | $147,682,214 |

(*) Includes 10% contingency on Construction and Permitting and Legal

Note - manufacturing equipment is not assessed with county property tax - so raw water pumps and WTP equipment have been removed from assessment

**KENTUCKY-AMERICAN WATER COMPANY**
**CASE NO. 2007-00134**
**COMMISSION STAFF'S FIRST SET OF INTERROGATORIES**
**AND REQUEST FOR PRODUCTION OF DOCUMENTS**
**Item 28 of 34**

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**Witness:** **Lou Walters/Michael Miller**

28. At pages 4 and 5 of his Direct Testimony, Louis M. Walters states that Kentucky-American will use its short-term borrowing capacity to meet the periodic needs for construction capital and will permanently finance the treatment facility with 60 percent long-term debt and 40 percent common equity. Provide Kentucky-American's projections for the conversion of short-term borrowings into long-term debt and common equity, to include the date of the conversion, the amount of long-term debt and common equity that will be issued, and the capital structure as of the date of the short-term debt conversion.

**Response:**

Please see the attached schedules that provide the expected capital structure and financing activities of KAWC through 2010.

**Kentucky-Amercian Water Company**
**Case No. 00134 - Reponse to Commission Staff First Set of DR's - Question 28**

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007** | | | | | | | | | | | | |
| **$ Capital:** | | | | | | | | | | | | |
| LT Debt | $77,000 | $77,000 | $73,900 | $73,900 | $73,900 | $49,900 | $49,900 | $49,900 | $49,900 | $99,900 | $99,900 | $99,900 |
| Preferred Stock | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 |
| ST Debt | $7,677 | $9,329 | $15,864 | $19,006 | $22,053 | $49,244 | $51,726 | $54,160 | $56,861 | $427 | $3,163 | $7,414 |
| Common Equity | $73,187 | $73,129 | $72,553 | $72,577 | $72,696 | $72,672 | $73,357 | $74,089 | $74,554 | $84,155 | $84,585 | $83,501 |
| Total Capitalization | $163,831 | $165,425 | $168,284 | $171,450 | $174,616 | $177,783 | $180,950 | $184,116 | $187,282 | $190,449 | $193,615 | $196,782 |
| **% Capital:** | | | | | | | | | | | | |
| LT Debt | 47.00% | 46.55% | 43.91% | 43.10% | 42.32% | 28.07% | 27.58% | 27.10% | 26.64% | 52.45% | 51.60% | 50.77% |
| Preferred Stock | 3.64% | 3.61% | 3.55% | 3.48% | 3.42% | 3.36% | 3.30% | 3.24% | 3.19% | 3.13% | 3.08% | 3.03% |
| ST Debt | 4.69% | 5.64% | 9.43% | 11.09% | 12.63% | 27.70% | 28.59% | 29.42% | 30.36% | 0.22% | 1.63% | 3.77% |
| Common Equity | 44.67% | 44.21% | 43.11% | 42.33% | 41.63% | 40.88% | 40.54% | 40.24% | 39.81% | 44.19% | 43.69% | 42.43% |
| Total Capitalization | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| **Financing Activity:** | | | | | | | | | | | | |
| Retire LT Debt | | | ($3,100) | | | ($24,000) | | | | ($14,000) | | |
| LT Debt | | | | | | | | | | $64,000 | | |
| Repay ST Debt | | | | | | | | | | ($59,000) | | |
| Equity | | | | | | | | | | $9,000 | | |
| Total Activity | $0 | $0 | ($3,100) | $0 | $0 | ($24,000) | $0 | $0 | $0 | $0 | $0 | $0 |
| **2008** | | | | | | | | | | | | |
| **$ Capital:** | | | | | | | | | | | | |
| LT Debt | $99,900 | $99,900 | $106,800 | $106,800 | $106,800 | $106,800 | $106,800 | $106,800 | $106,800 | $123,800 | $123,800 | $123,800 |
| Preferred Stock | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 |
| ST Debt | $10,902 | $12,388 | $820 | $820 | $4,007 | $9,206 | $13,632 | $17,254 | $23,081 | $350 | $1,439 | $4,233 |
| Common Equity | $83,804 | $84,207 | $88,476 | $88,904 | $89,408 | $89,133 | $90,212 | $91,348 | $91,360 | $97,405 | $98,257 | $97,443 |
| Total Capitalization | $200,573 | $202,462 | $202,063 | $202,491 | $206,182 | $211,106 | $216,611 | $221,369 | $227,208 | $227,522 | $229,463 | $231,443 |
| **% Capital:** | | | | | | | | | | | | |
| LT Debt | 49.81% | 49.34% | 52.85% | 52.74% | 51.80% | 50.59% | 49.30% | 48.25% | 47.01% | 54.41% | 53.95% | 53.49% |
| Preferred Stock | 2.97% | 2.95% | 2.95% | 2.95% | 2.89% | 2.83% | 2.75% | 2.70% | 2.63% | 2.62% | 2.60% | 2.58% |
| ST Debt | 5.44% | 6.12% | 0.41% | 0.40% | 1.94% | 4.36% | 6.29% | 7.79% | 10.16% | 0.15% | 0.63% | 1.83% |
| Common Equity | 41.78% | 41.59% | 43.79% | 43.91% | 43.36% | 42.22% | 41.65% | 41.27% | 40.21% | 42.81% | 42.82% | 42.10% |
| Total Capitalization | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| **Financing Activity:** | | | | | | | | | | | | |
| Retire LT Debt | | | ($3,100) | | | | | | | | | |
| LT Debt | | | $10,000 | | | | | | | $17,000 | | |
| Repay ST Debt | | | ($15,000) | | | | | | | ($22,000) | | |
| Equity | | | $5,000 | | | | | | | $5,000 | | |
| Total Activity | $0 | $0 | ($3,100) | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |

| | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2009** | | | | | | | | | | | | |
| **$ Capital:** | | | | | | | | | | | | |
| LT Debt | $123,800 | $123,800 | $120,700 | $120,700 | $120,700 | $120,700 | $120,700 | $120,700 | $120,700 | $146,700 | $146,700 | $146,700 |
| Preferred Stock | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 |
| ST Debt | $4.619 | $7,533 | $14.953 | $20.811 | $23.291 | $26,940 | $28,885 | $30,078 | $36,721 | $0 | $0 | $5,251 |
| Common Equity | $98,203 | $98,748 | $97,424 | $98,178 | $99,002 | $99,010 | $100,386 | $101,882 | $101,491 | $119,799 | $120,982 | $118,713 |
| Total Capitalization | $232.589 | $236,048 | $239,044 | $245,656 | $248,960 | $252,617 | $255,938 | $258,627 | $264,879 | $272,466 | $273,649 | $276,631 |
| **% Capital:** | | | | | | | | | | | | |
| LT Debt | 53.23% | 52.45% | 50.49% | 49.13% | 48.48% | 47.78% | 47.16% | 46.67% | 45.57% | 53.84% | 53.61% | 53.03% |
| Preferred Stock | 2.57% | 2.53% | 2.50% | 2.43% | 2.40% | 2.36% | 2.33% | 2.31% | 2.25% | 2.19% | 2.18% | 2.16% |
| ST Debt | 1.99% | 3.19% | 6.26% | 8.47% | 9.36% | 10.66% | 11.29% | 11.63% | 13.86% | 0.00% | 0.00% | 1.90% |
| Common Equity | 42.22% | 41.83% | 40.76% | 39.97% | 39.77% | 39.19% | 39.22% | 39.39% | 38.32% | 43.97% | 44.21% | 42.91% |
| Total Capitalization | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| **Financing Activity:** | | | | | | | | | | | | |
| *Retire LT Debt* | | | ($3,100) | | | | | | | | | |
| LT Debt | | | | | | | | | | $26,000 | | |
| *Repay ST Debt* | | | | | | | | | | ($44,000) | | |
| Equity | | | | | | | | | | $18,000 | | |
| Total Activity | $0 | $0 | ($3,100) | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| **2010** | | | | | | | | | | | | |
| **$ Capital:** | | | | | | | | | | | | |
| LT Debt | $146,700 | $146,700 | $156,600 | $156,600 | $156,600 | $156,600 | $156,600 | $156,600 | $156,600 | $179,600 | $179,600 | $179,600 |
| Preferred Stock | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 | $5,967 |
| ST Debt | $5,250 | $6,026 | $0 | $1,091 | $1,091 | $3,062 | $6,165 | $8,399 | $14,196 | $91 | $475 | $251 |
| *Common Equity* | $119,465 | $120,257 | $125,932 | $126,679 | $127,626 | $126,846 | $128,237 | $129,752 | $129,151 | $139,023 | $139,872 | $137,502 |
| Total Capitalization | $277,382 | $278,950 | $288,499 | $290,337 | $291,284 | $292,475 | $296,969 | $300,718 | $305,914 | $324,681 | $325,914 | $323,320 |
| **% Capital:** | | | | | | | | | | | | |
| LT Debt | 52.89% | 52.59% | 54.28% | 53.94% | 53.76% | 53.54% | 52.73% | 52.08% | 51.19% | 55.32% | 55.11% | 55.55% |
| Preferred Stock | 2.15% | 2.14% | 2.07% | 2.06% | 2.05% | 2.04% | 2.01% | 1.98% | 1.95% | 1.84% | 1.83% | 1.85% |
| ST Debt | 1.89% | 2.16% | 0.00% | 0.38% | 0.37% | 1.05% | 2.08% | 2.79% | 4.64% | 0.03% | 0.15% | 0.08% |
| Common Equity | 43.07% | 43.11% | 43.65% | 43.63% | 43.81% | 43.37% | 43.18% | 43.15% | 42.22% | 42.82% | 42.92% | 42.53% |
| Total Capitalization | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% | 100.00% |
| **Financing Activity:** | | | | | | | | | | | | |
| *Retire LT Debt* | | | ($3,100) | | | | | | | | | |
| LT Debt | | | $13,000 | | | | | | | $23,000 | | |
| Repay ST Debt | | | ($18,000) | | | | | | | ($32,000) | | |
| Equity | | | $5,000 | | | | | | | $9,000 | | |
| Total Activity | $0 | $0 | ($3,100) | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |

**KENTUCKY-AMERICAN WATER COMPANY**
**CASE NO. 2007-00134**
**COMMISSION STAFF'S FIRST SET OF INTERROGATORIES**
**AND REQUEST FOR PRODUCTION OF DOCUMENTS**
**Item 29 of 34**

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**Witness: Louis M. Walters**

29. At pages 4 and 5 of his Direct Testimony, Mr. Walters explains that obtaining tax-exempt financing entails significant added internal and external costs. Provide a comparison of the issuance costs that Kentucky-American will incur for conventional long-term debt as opposed to tax-exempt debt. This comparison should include all workpapers, show all calculations, and state all assumptions used.

**Response:**

Please see the attached worksheet. We have assumed that the project will be financed equally over a three year period and that the first year debt financing requirement amounts to $31.6 million. We have further assumed that KAWC is able to secure authorization to issue $5 million in Kentucky tax-exempt debt and the remaining amount, $26.6 million, is financed through AWCC. As demonstrated on the attached worksheet, the utilization of $5 million of tax-exempt debt reduces the annual weighted average cost of debt by 12.4 basis points. If KAWC were to secure authorization of less than $5 million in tax-exempt debt, the impact of the tax-exempt debt is smaller on the annual weighted average cost of debt.

The AWCC financing is based upon the actual results to the recently completed private placement financing. The KAWC tax-exempt financing is based on best estimates using recently completed tax-exempt financing in another jurisdiction.

It is KAWC's position that the utilization of tax-exempt debt will have a positive benefit on the weighted average cost of debt for the project, but only if the Company can secure amounts at or above the $5 million level.

Please note that this analysis does not take into account the Company's internal costs in completing two separate financing transactions.

Kentucky-American Water
Comparison of Issuance Costs

| | | KAWC Tax-Exempt(1) | KAWC Taxable(2) | TOTAL | AWCC Taxable(3) |
|---|---|---|---|---|---|
| Financing Amount | | $ 5,000,000 | $ 26,640,000 | $ 31,640,000 | $ 1,100,000,000 |
| Maturity (Years) | | 30 | 12.92 | | 12.92 |
| Interest rate | | 4.600% | 5.668% | | 5.668% |
| Out-of-pocket Expenses/Fees | | $ 80,000 | | | $ 162,000 |
| Underwriters Counsel | | $ 200,000 | | | $ 276,200 |
| Company Counsel | | $ 60,000 | | | N/A |
| Authority's (Borrower's) Counsel | | $ 50,000 | | | $ 3,300,000 |
| Investment Bankers' Fee | | | | | N/A |
| Bond Insurance(4) | 0.60% | $ 71,400 | | | |
| TOTAL | | $ 461,400 | | | $ 3,738,200 |
| As a percentage of principal | | 9.23% | 0.34% | | 0.34% |
| Annual cost as a percentage of principal | | 0.308% | 0.026% | | 0.026% |
| Total all-in Rate | | 4.908% | 5.694% | | 5.694% |
| Weighted average KWAC Year 1 | | | | 5.570% | |

**Net savings from addition of tax-exempt debt represents 12.4 basis points (5.694% - 5.570%) annually over the life of the private placement debt.**

**Assumptions**

| | | | Tax-Exempt | Taxable(2) |
|---|---|---|---|---|
| Total size of Project | | $ 158,200,000 | | |
| % debt | 60% | $ 94,920,000 | | |
| % equity | 40% | $ 63,280,000 | | |
| Debt financing requirement 1/3 each year | | | | |
| Year 1 | | $ 31,640,000 | $ 5,000,000 | $ 26,640,000 |
| Year 2 | | $ 31,640,000 | | |
| Year 3 | | $ 31,640,000 | | |

(1) Tax-exempt debt calculations based on estimates of costs associated with similar transactions completed in other states
(2) KAWC is assumed to borrow $26.6M from AWCC.
(3) Taxable Debt calculations based upon recently completed AWCC Private Placement offerings. See page 2.
(4) Bond insurance required for Tax-exempt debt to receive an AAA rating. 60 basis points x total prinicpal and interest.

American Water Capital Corp.
Private Placement Debt Issuance

Weighted average interest rate of $1.1 Billion Private Placement issue

| 12/21/2006 | Amount | Interest Rate | Maturity (Years) | Weighted Average Interest | Weighted Average Maturity (Years) |
|---|---|---|---|---|---|
| Series A | $ 101,000,000 | 5.390% | 7 | 5,443,900 | 707,000,000 |
| Series B | $ 37,500,000 | 5.520% | 10 | 2,070,000 | 375,000,000 |
| Series C | $ 329,500,000 | 5.620% | 12 | 18,517,900 | 3,954,000,000 |
| Series D | $ 432,000,000 | 5.770% | 15 | 24,926,400 | 6,480,000,000 |
| 3/29/2007 | | | | | |
| Series E | $ 100,000,000 | 5.620% | 12 | 5,620,000 | 1,200,000,000 |
| Series F | $ 100,000,000 | 5.770% | 15 | 5,770,000 | 1,500,000,000 |
| Total | $ 1,100,000,000 | | | 62,348,200 | 14,216,000,000 |

| | | |
|---|---|---|
| Weighted Average Interest Rate | 5.668% | |
| Weighted Average Maturity | | 12.92 |

**KENTUCKY-AMERICAN WATER COMPANY**
**CASE NO. 2007-00134**
**COMMISSION STAFF'S FIRST SET OF INTERROGATORIES**
**AND REQUEST FOR PRODUCTION OF DOCUMENTS**
**Item 30 of 34**

---

**Witness:**

30. Provide all correspondence, electronic mail messages, analyses, notes, memoranda, studies and related documents that Kentucky-American, AWWC, or any AWWC affiliate prepared or commissioned, that discuss the possible solutions to Kentucky-American's supply deficit.

**Response:** Kentucky American Water Company will comply with the directive contained in Jerry Wuetcher's e-mail to all parties dated May 16, 2007 for documents subsequent to May 15, 2001:

"KAWC will tender the documents/materials to the PSC staff for inspection and review. These materials would also be available for all parties to inspect, review and copy. The documents that PSC Staff and any interested intervenor finds relevant and wishes a part of the record would be copied and would be made part of KAWC's response to the PSC Staff's Discovery Request. All parties to the proceeding would receive a copy of the materials made part of the record. At the end of the inspection period, the tendered materials would be returned to KAWC."

# KENTUCKY-AMERICAN WATER COMPANY
## CASE NO. 2007-00134
## COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUEST FOR PRODUCTION OF DOCUMENTS
## Item 31 of 34

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**Witness:** **Nick Rowe/Michael A. Miller**

31. Provide all correspondence, electronic mail messages, analyses, notes, memoranda, studies and related documents from RWE Aktiengesellschaft, Thames Water Aqua Holdings GmbH or AWWC directing Kentucky-American to construct the 20 MGD treatment facility at Pool 3 of the Kentucky River to solve the supply deficit.

    a. Assume that the Commission grants Kentucky-American a Certificate of Public Convenience and Necessity to construct the treatment facility on Pool 3 of the Kentucky River and that construction commences in January 2008. Provide Kentucky-American's estimate as to the construction's effect on general rates for water service for the period from 2008 to 2012. This response should include all workpapers, show all calculations, and state all assumptions that Kentucky-American used to develop its estimate.

**<u>Response</u>:**

**31.**

a. Please attached schedules and work papers regarding the rate impact of the project to solve the source of supply deficit.

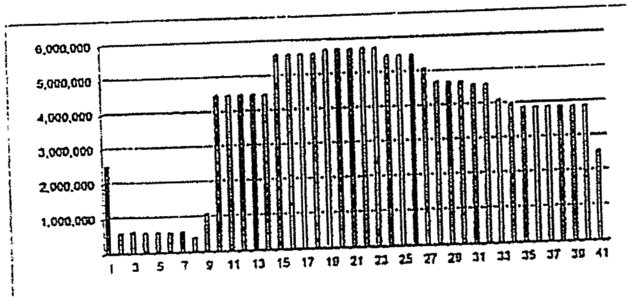
## Kentucky-American Water Company
## Case No. 2007-00134 - Schedule in Response to Staff - Set 1- Q31
## Estimate of Rate Impact of Source of Supply Project

| (000) Omitted | 2007 Rate Case Rev. Requirement Calculation | 2008 Rate Case Rev. Requirement Calculation | 2010 Rate Case Rev. Requirement Calculation |
|---|---|---|---|
| 13 Month Average Utility Plant | $37,330 | $115,778 | $159,727 |
| Less: Rate Base from Previous Case | $0 | $0 | ($115,778) |
| Less: Deprecition Expense | $0 | $0 | ($3,594) |
| Deferred Income Tax Exp | $0 | $0 | ($1,118) |
| Rate Base | $37,330 | $115,778 | $39,237 |
| WCC currently authorized | 7.75% | 7.75% | 7.75% |
| UOI | $2,893 | $8.973 | $3,041 |
| Revenue Gross-up Factor | 1.6540077 | 1.6540077 | 1.6540077 |
| Revenue Requirement | $4,785 | $14,841 | $5.030 |
| Less AFUDC | ($4,785) | $0 | $0 |
| Rate Impact Before Depr & Def Inc Tax | $0 | $14,841 | $5,030 |
| Add: Depreciation Expense | $0 | $0 | $3,594 |
| Deferred Income Tax Expense | $0 | $0 | $1.118 |
| O&M Expenses | $0 | $0 | $1,185 |
| **Rate Impact from SS Project** | **$0** | **$14,841** | **$10,927** |
| Going Level Revenues | $50,687 | $50.687 | $65.528 |
| **% Rate Increase** | **0.00%** | **29.28%** | **16.67%** |
| **Cummulataive % Increase** | **0.00%** | **29.28%** | **45.96%** |

**Kentucky-American Water Co.**
**Schedule in Response to Commission Staff-First Set of DR's-Question 31**

| (000) Omitted | | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **2007** | | | | | | | | | | | | | | |
| Monthly Expenditure | | | | | | 574 | 602 | 575 | 575 | 575 | 575 | 416 | 1,070 | |
| Cumulative Expenditure | | | | | 2,506 | 3,080 | 3,682 | 4,257 | 4,832 | 5,407 | 5,982 | 6,398 | 7,468 | |
| **2008** | | | | | | | | | | | | | | |
| Monthly Expenditure | | 4,477 | 4,477 | 4,477 | 4,477 | 4,477 | 5,618 | 5,618 | 5,618 | 5,618 | 5,728 | 5,728 | 5,728 | |
| Cumulative Expenditure | 7468 | 11,945 | 16,422 | 20,899 | 25,376 | 29,853 | 35,471 | 41,089 | 46,707 | 52,325 | 58,053 | 63,781 | 69,509 | 37,330 |
| | | | | | | Case filed May 1, 2007 - 13 month avg. rate base - Test-year ended November 2008 | | | | | | | | |
| **2009** | | | | | | | | | | | | | | |
| Monthly Expenditure | | 5,737 | 5,737 | 5,513 | 5,513 | 5,513 | 5,085 | 4,695 | 4,695 | 4,695 | 4,585 | 4,585 | 4,097 | |
| Cumulative Expenditure | 69509 | 75,246 | 80,983 | 86,496 | 92,009 | 97,522 | 102,607 | 107,302 | 111,997 | 116,692 | 121,277 | 125,862 | 129,959 | 115,778 |
| | | | | | | Planned Case filed Sept. 1, 2008 - 13 month avg. rate base - Test-year ended March 2010 | | | | | | | | |
| **2010** | | | | | | | | | | | | | | |
| Monthly Expenditure | | 3,967 | 3,873 | 3,873 | 3,873 | 3,873 | 3,873 | 3,873 | 2,563 | | | | | |
| Cumulative Expenditure | 129959 | 133,926 | 137,799 | 141,672 | 145,545 | 149,418 | 153,291 | 157,164 | 159,727 | 159,727 | 159,727 | 159,727 | 159,727 | 159,727 |
| | | | | | | Planned Case filed June 1, 2010 - 13 month avg. rate base - Test-year ended December 2011 | | | | | | | | |

| | | To Date | 2007 Period 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2008 Period 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Administration | | | | | | | | | | | | | | | | | | | | |
| Engineering, Permitting, Legal, , Contingencies | 19,059,207 | 2,417,956 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 |
| Lake, River and Other Intakes | 1,018,000 | | | | | | | | | | 84,833 | 84,833 | 84,833 | 84,833 | 84,833 | 84,833 | 84,833 | 84,833 | 84,833 | 84,833 |
| Raw Water Pumping Station | | | | | | | | | | | | | | | | | | | | |
| Structure | 7,024,200 | | | | | | | | | | 390,233 | 390,233 | 390,233 | 390,233 | 390,233 | 390,233 | 390,233 | 390,233 | 390,233 | 390,233 |
| Electric Pumping Equipment | 1,221,600 | | | | | | | | | | | | | | | | | | | |
| Supply Mains | 916,200 | | | | | | | | | | | | | | | 76,350 | 76,350 | 76,350 | 76,350 | 76,350 |
| Water Treatment Plant | | | | | | | | | | | | | | | | | | | | |
| Structure | 40,597,710 | | | | | | | | | | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 |
| Equipment | 8,795,200 | | | | | | | | | | | | | | | 488,678 | 488,678 | 488,678 | 488,678 | 488,678 |
| Electric Pumping Equipment | 4,211,100 | | | | | | | | | | | | | | | 350,925 | 350,925 | 350,925 | 350,925 | 350,925 |
| Finished Water Main | 60,928,273 | | | | | | | | | | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 |
| Transmission Storage | 2,018,375 | | | | | | | | | | | | | | | 224,264 | 224,264 | 224,264 | 224,264 | 224,264 |
| Transmission Water Pumping Station | | | | | | | | | | | | | | | | | | | | |
| Structure | 3,110,214 | | | | | | | | | | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 |
| Electric Pumping Equipment | 1,320,000 | | | | | | | | | | | | | | | | | | | 110,000 |
| Land | | | | | | | | | | | | | | | | | | | | |
| Intake and Water Treatment Plant | 665,000 | 68,500 | | 28,000 | | | | | | 588,500 | | | | | | | | | | |
| Transmission Storage and Pumping | 85,000 | 20,000 | | | | | | | | 65,000 | | | | | | | | | | |
| Finished Water Main | 950,400 | | 158,400 | 158,400 | 158,400 | 158,400 | 158,400 | 158,400 | | | | | | | | | | | | |
| SUBTOTAL: | 151,939,539 | 2,506,456 | 574,433 | 602,433 | 574,433 | 574,433 | 574,433 | 574,433 | 416,033 | 1,069,533 | 4,234,241 | 4,234,241 | 4,234,241 | 4,234,241 | 4,234,241 | 5,374,458 | 5,374,458 | 5,374,458 | 5,374,458 | 5,484,458 |
| Finance | | | | | | | | | | | | | | | | | | | | |
| AFUDC | 7,704,195 | | | | | | | | | | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 |
| TOTALS: | 159,723,734 | 2,506,456 | 574,433 | 602,433 | 574,433 | 574,433 | 574,433 | 574,433 | 416,033 | 1,069,533 | 4,477,497 | 4,477,497 | 4,477,497 | 4,477,497 | 4,477,497 | 5,617,714 | 5,617,714 | 5,617,714 | 5,617,714 | 5,727,714 |



| 11 | 12 | 2009 Period 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 2010 Period 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | Check |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 416,033 | 10,059,207 |
| 84,833 | 84,833 | | | | | | | | | | | | | | | | | | | | | 1,010,000 |
| 390,233 | 390,233 | 390,233 | 390,233 | 390,233 | 390,233 | 390,233 | 390,233 | | | | | | | | | | | | | | | 7,024,200 |
| | | 93,969 | 93,969 | 93,969 | 93,969 | 93,969 | 93,969 | 93,969 | 93,969 | 93,969 | 93,969 | 93,969 | 93,969 | 93,969 | | | | | | | | 1,221,600 |
| 76,350 | 76,350 | 76,350 | 76,350 | 76,350 | 76,350 | 76,350 | | | | | | | | | | | | | | | | 910,200 |
| 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | 1,309,604 | | 40,597,710 |
| 488,678 | 488,678 | 488,678 | 488,678 | 488,678 | 488,678 | 488,678 | 488,678 | 488,678 | 488,678 | 488,678 | 488,678 | 488,678 | | | | | | | | | | 8,796,200 |
| 350,925 | 350,925 | 350,925 | 350,925 | 350,925 | 350,925 | 350,925 | | | | | | | | | | | | | | | | 4,211,100 |
| 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 1,903,946 | 60,926,273 |
| 224,264 | 224,264 | 224,264 | 224,264 | | | | | | | | | | | | | | | | | | | 2,010,375 |
| 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | 129,592 | | | | | | | | | 3,110,214 |
| 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | 110,000 | | | | | | | | | | | | 1,320,000 |
| | | | | | | | | | | | | | | | | | | | | | | 085,000 |
| | | | | | | | | | | | | | | | | | | | | | | 85,000 |
| | | | | | | | | | | | | | | | | | | | | | | 950,400 |
| 5,484,458 | 5,484,458 | 5,493,594 | 5,493,594 | 5,269,330 | 5,269,330 | 5,269,330 | 4,842,055 | 4,451,822 | 4,451,822 | 4,451,822 | 4,341,822 | 4,341,822 | 3,853,144 | 3,723,552 | 3,629,582 | 3,629,582 | 3,629,582 | 3,629,582 | 3,629,582 | 3,629,582 | 2,319,979 | 151,939,539 |
| 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 243,256 | 7,784,195 |
| 5,727,714 | 5,727,714 | 5,736,850 | 5,736,850 | 5,512,586 | 5,512,586 | 5,512,586 | 5,085,311 | 4,695,078 | 4,695,078 | 4,695,078 | 4,585,078 | 4,585,078 | 4,096,400 | 3,966,808 | 3,872,838 | 3,872,838 | 3,872,838 | 3,872,838 | 3,872,838 | 3,872,838 | 2,563,235 | 150,723,734 |

KENTUCKY-AMERICAN WATER COMPANY
RATE CASE PROGRESS REPORT

RRD - 3
PAGE 1

DATE FILED: APRIL 30 2004
STATUTORY DATE: December 1 2004
EFFECTIVE DATE: MAY 30, 2004 (If rates not suspended)
FORECASTED TEST PERIOD: NOVEMBER 30 2005
CASE NO 2004-00103

| | CENTERAL | TRI-VILLAGE | ELK LAKE |
|---|---|---|---|
| AVERAGE RESIDENTIAL BILL: | | | |
| USAGE: | 60,900 | 60,900 | 60 900 |
| PRESENT RATES: | $223 80 | $462 36 | $338 16 |
| PROPOSED RATE: | $259 20 | $576 00 | $361 92 |
| AUTH RATES: | $243 43 | $462 36 | $338 16 |

| | | PROPOSED GENERAL INCREASE | PER ORDER |
|---|---|---|---|
| 1 | REVENUES AT PRESENT RATES | $42,637,550 | $43,036,757 |
| 2 | AMOUNT OF INCREASE | 7 297.602 | 4,283 302 |
| 3 | % INCREASE | 17 12% | 9 95% |
| 4a | REVENUE (OPERATING) | 49 935 152 | 47 320,059 |
| 4b | AFUDC | 470,940 | 337,570 |
| 4c | TOTAL REVENUES | 50,406,092 | 47,657,629 |
| 5 | O & M EXPENSE | 21 910 724 | 20 907 707 |
| 6 | DEPRECIATION | 7 766 592 | 7 743 193 |
| 7 | GENERAL TAXES | 2 727,249 | 2 699 777 |
| 8 | INCOME TAXES | 5,157,207 | 4,196,608 |
| | SUB-TOTAL | 37,561,772 | 35,547,285 |
| 9 | UTILITY OPERATING INCOME | 12,844,320 | 12,110,344 |
| 10 | INTEREST ON LONG - TERM DEBT | 5 169 981 | 5 078 531 |
| 11 | OTHER INTEREST | 159 076 | 156 263 |
| 12 | PREFERRED DIVIDENDS | 461 321 | 453 161 |
| 13 | OTHER DEDUCTIONS | 0 | 0 |
| | SUB-TOTAL | 5,790,378 | 5,687,955 |
| 14a | INCOME TO COMMON STOCK (FALLOUT) | 7,053,942 | 6,422,389 |
| 14b | CALCULATED INCOME TO COMMON STOCK | $7,333,419 | $6,422,389 |
| 15 | ORIGINAL COST OF RATE BASE | $159 076,335 | $156 262,507 |
| 16 | RATE OF RETURN ON RATE BASE | 8 07% | 7 75% |
| 17 | RATE BASE AS % OF CAPITALIZATION | 99 74% | 97 99% |

| | | AMOUNT | RATIO | COST RATE | WEIGHTED |
|---|---|---|---|---|---|
| 18 | COST OF CAPITAL PER: PROPOSED CASE | | | | |
| a | LONG-TERM DEBT | 81 944 180 | 51 380% | 6 330% | 3 25% |
| b | SHORT-TERM DEBT | 5.931.051 | 3 720% | 2 700% | 0 10% |
| c | PREFERRED STOCK | 6,028.514 | 3 780% | 7 720% | 0 29% |
| d | COMMON EQUITY | 65,593 875 | 41 130% | 11 200% | 4 61% |
| e | DEFERRED TAXES | 0 | 0 000% | 0 000% | 0 00% |
| f | JDITC | 0 | 0 00% | 0 00% | 0 00% |
| g | OTHER CAPITAL ELEMENTS | 0 | 0.00% | 0 00% | 0.00% |
| | TOTALS | $159,497,620 | 100.01% | | 8.25% |
| 19 | COST OF CAPITAL PER: COMMISSION ORDER | | | | |
| a | LONG-TERM DEBT | 81.944 180 | 51 388% | 6 33% | 3 25% |
| b | SHORT-TERM DEBT | 5.894 582 | 3 697% | 2 77% | 0 10% |
| c | PREFERRED STOCK | 6,028 514 | 3 781% | 7 72% | 0 29% |
| d | COMMON EQUITY | 65,593,875 | 41 135% | 10 00% | 4 11% |
| e | DEFERRED TAXES | 0 | 0 00% | 0 00% | 0 00% |
| f | JDITC | 0 | 0 00% | 0 00% | 0 00% |
| g | OTHER CAPITAL ELEMENTS | 0 | 0.00% | 0 00% | 0.00% |
| | TOTALS | $159,461,151 | 100.00% | | 7,75% |

SIGNATURE/DATE

KENTUCKY-AMERICAN WATER COMPANY
CASE NO: 2007-00143
GROSS REVENUE CONVERSION FACTOR
FOR THE TWELVE MONTHS ENDED: NOVEBER 30, 2008


Witness Responsible: S.A. Miller

DATA: _X_ BASE PERIOD _X_ FORECASTED PERIOD
TYPE OF FILING: _X_ ORIGINAL ___ UPDATED ___ REVISED
WORKPAPER REFERENCE NO(S).: W/P-3

| Line No. | Description | | Central Div | Tri-Village | Elk Lake | Owenton |
|---|---|---|---|---|---|---|
| 1 | | | 100.00000% | 100.00000% | 100.00000% | 100.00000% |
| 2 | Operating Revenues | | | | | |
| 3 | | | 0.880760% | 0.880760% | 0.880760% | 0.880760% |
| 4 | Less: Uncollectibles | | | | | |
| 5 | | | 0.16800% | 0.16800% | 0.16800% | 0.16800% |
| 6 | Less: PSC Fees | | | | | |
| 7 | | | 98.9512% | 98.9512% | 98.9512% | 98.9512% |
| 8 | Net Revenues | | | | | |
| 9 | | | 5.93707% | 5.93707% | 5.93707% | 5.93707% |
| 10 | SIT Rate: | 6.00% | | | | |
| 11 | | | 93.01417% | 93.01417% | 93.01417% | 93.01417% |
| 12 | Income before Federal Income Taxes | | | | | |
| 13 | | | 32.55496% | 32.55496% | 32.55496% | 32.55496% |
| 14 | FIT Rate: | 35.00% | | | | |
| 15 | | | 60.45921% | 60.45921% | 60.45921% | 60.45921% |
| 16 | Operating Income Percentage | | | | | |
| 17 | | | | | | |
| 18 | | | 1.6540077 | 1.6540077 | 1.6540077 | 1.6540077 |
| 19 | Gross Revenue Conversion Factor (1) | | | | | |
| 20 | | | | | | |
| 21 | | | | | | |
| 22 | | | | | | |
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| 25 | (1) CALCULATED BY DIVIDING 100% BY THE OPERATING INCOME PERCENTAGE | | | | | |
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**Witness:** **Linda C. Bridwell**

32. Refer to Kentucky-American's application, Exhibit G, "Water Withdrawal Permit: #1572."

    a. Kentucky-American is allowed to withdraw 20 MGD per day during the 3-month period from June through August. Explain what would happen if a drought extended beyond the month of August requiring Kentucky-American to withdraw 20 MGD per day in September or October.

    b. If the proposed water treatment plant capacity is expanded by 5 MGD to serve BWSC, state whether Kentucky-American may increase its withdrawals from the Kentucky River from 20 MGD to 25 MGD per day during the period from June through August.

    c. List and describe each meeting that Kentucky-American has had with Division of Water officials regarding increasing its withdrawals from Pool 3 from 20 MGD to 25 MGD during the months of June through August.

    d. Provide all correspondence, including electronic mail messages that Kentucky-American officials and employees have received from or sent to Division of Water officials regarding increasing its withdrawals from Pool 3 from 20 MGD to 25 MGD per day during the months of June through August.

**Response:**

a. Kentucky Division of Water generally permits withdrawals based on the anticipated average production of the plant and considers requests for increased withdrawal amounts based on actual withdrawals at or above the permitted amount for over 30 days on average. KAW would obviously be in direct communication with the DOW during a prolonged drought and would request a temporary increase of its withdrawal amount during a drought period as it requests and would not anticipate any problems with that increase being granted.
b. KAW included in its permit application and in its discussions with the possibility of a treatment facility up to 30 mgd and has received no indications that it would not be permitted to increase its withdrawal permit limits as necessary.
c. KAW met with Division of Water officials from different branches on March 28,

2006 to discuss the various permits required including the water withdrawal permit. KAW met again with DOW officials on January 19, 2007 to review the preliminary design of the treatment. Representatives from the water resources branch were in attendance at that meeting and discussed an increase from 20 mgd to 25 mgd.

d. No specific correspondence have been received or were sent to Division of Water officials regarding increasing its withdrawals from Pool 3 from 20 MGD to 25 MGD. Status updates of the construction progress are required to be submitted quarterly and are attached.

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**Witness:** Richard C. Svindland

33. Exhibit A to the application shows two access roads to the raw water pump station. Plan C2 shows a 12 foot paved utility road from the water treatment plant to the raw water pump station. Plan C1 shows a paved/gravel road for access to the water treatment plant.

    a. Explain why there are two routes to the raw water pump station.

    b. Identify the route that Kentucky-American will use for construction of the raw water intake and pump station.

    c. Identify the route that Kentucky-American will use for maintenance of the raw water intake and pump station.

    d. Describe the surface (e.g., pavement, gravel) of the existing access road on Plan C1.

    e. Describe the additional roads and their surfaces (e.g., pavement, gravel) that Kentucky-American intends to construct under Plan C1 in addition to the existing access roads.

    f. The access road on Plan C1 does not appear to terminate at a local public road or at the proposed water treatment plant. Provide a map that depicts the access road with a complete route to the proposed water treatment plant.

    g. Describe Kentucky-American's legal access rights throughout the entirety of the access road route shown on Plan C1.

    h. At page 10 of his direct testimony, Mr. Svindland states that Kentucky-American has obtained an option to purchase 80 acres of land for the intake, raw water pump station, and sludge disposal area from the Cartwright Trust. State whether the access road on Plan C1 is located on the optioned 80 acres. Provide a map that clearly shows the boundary of the optioned property and its relationship to the access road in Plan C1.

    i. At page 10 of his direct testimony, Mr. Svindland states that "the final land acreage amount [is] to be determined upon completion of design." State whether Kentucky-American may purchase additional land from the Cartwright Trust in addition to the optioned 80 acres of land. If yes, provide a map that clearly shows the boundary of other possible land available from the Cartwright Trust.

j. (1) State whether Kentucky-American intends to use any of the Cartwright Trust property for sludge disposal.

(2) If yes, describe how sludge would be delivered to the site. If Kentucky-American intends to truck sludge, identify the route from the proposed water treatment plant to the Cartwright Trust property and the part of that route that is a public road.

**Response:**

a. There are two routes to the Raw Water Pump Station. One route is referred to as the "Pump Station Access Road" while the other route is referred to as the "12' Utility Vehicle Access Road." The 12' Utility Vehicle Access Road is to steep to accommodate large trucks and equipment needed to maintain the intake pumps and is to allow pump station access when the river elevation is greater than 480 – 485. The "Pump Station Access Road" can accommodate all vehicles needed to construct and maintain the pump station except when river levels exceed elevation 480. The 12' Utility Vehicle Access Road will also accommodate an aerial electrical feed into the pump station.

b. Both routes will likely be used. KAW will not dictate means and methods of construction to the raw water pump station and water treatment plant construction.

c. Every day maintenance will be via the 12' Utility Vehicle Access Road. Large maintenance such as removing pumps from the site will be via the other road.

d. The existing access road is gravel.

e. Most of the new access road will be gravel. The drawings (C1) indicate a transition to bituminous paving. This is proposed due to the proximity of the road to the lake so as to avoid vehicle loosing traction in that area.

f. See attached map KAW_R_PSCDR1#33_Attachment1_52107.pdf

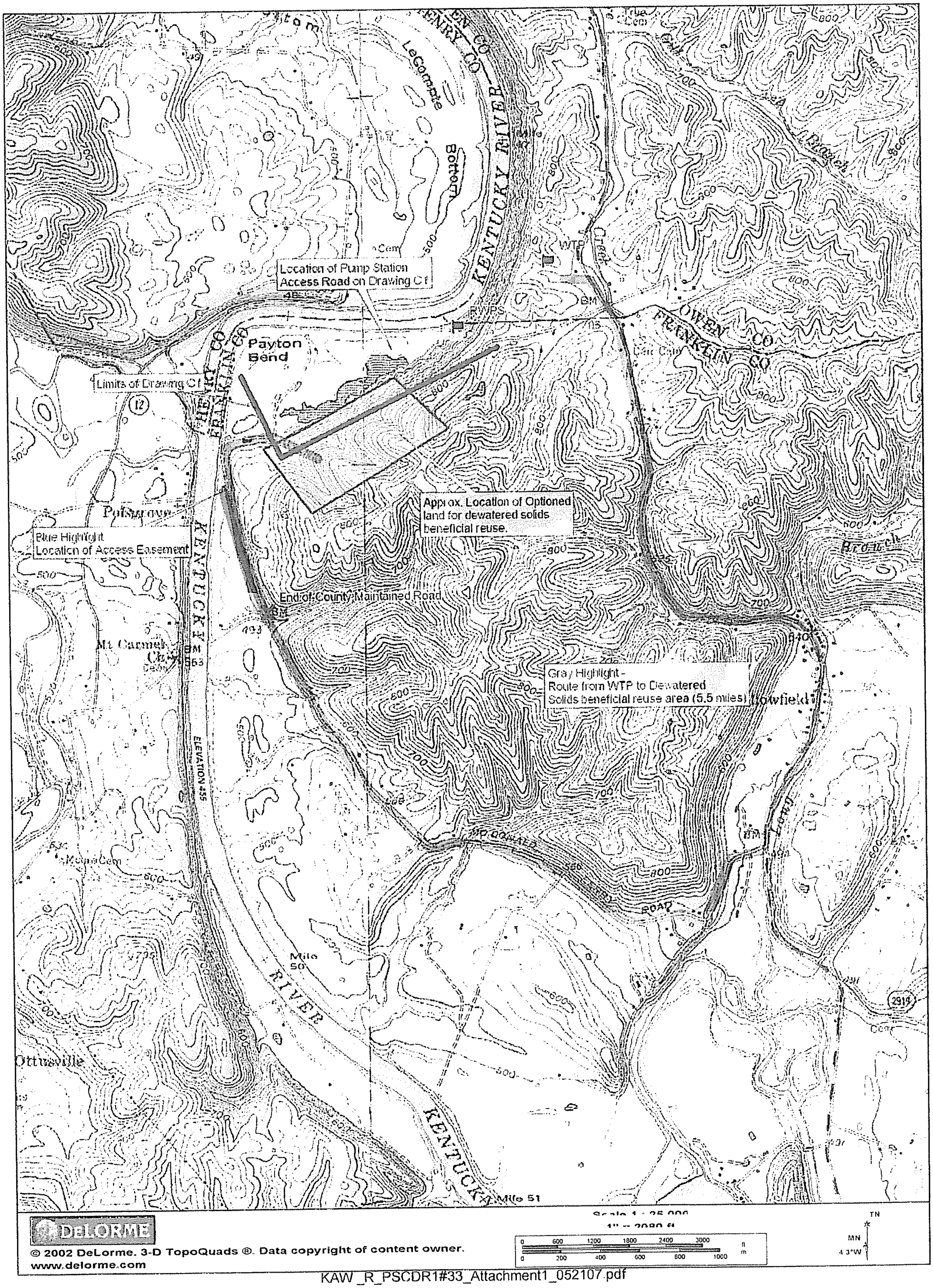
g. As part of the option with the Cartwright Trust an access easement will be conveyed to KAW. The Cartwright property has an access easement from Kemper for entry to their property off of McDonalds Ferry Road. The access easement also applies to KAW once the option is taken and land transfer completed.

h. See map provided under answer f.

i. No, KAW does not envision at this time purchase more than 80 acres from the

Cartwright Trust.

j. Yes, KAW intends to haul dewatered solids from the WTP to optioned land on the Cartwright property. The approx. 5 mile route is highlighted on the map provide for items f and h.



Location of Pump Station
Access Road on Drawing C1
Limits of Drawing C1
Payton Bend
WTP
RWPS
LeCompte Bottom
KENTUCKY RIVER
HENRY CO
FRANKLIN CO
OWEN CO
Approx. Location of Optioned land for dewatered solids beneficial reuse.
Blue Highlight
Location of Access Easement
Polsgrove
End of County Maintained Road
Mt. Carmel Ch
Gray Highlight -
Route from WTP to Dewatered
Solids beneficial reuse area (5.5 miles)
KENTUCKY
RIVER
KENTUCKY
Mile 50
Mile 51
ELEVATION 455
DELORME
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www.delorme.com

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**Witness: Nick O. Rowe/Linda C. Bridwell**

34. The map in Exhibit A to the Application, Plan C2, indicates that the proposed water treatment plant will be built in close proximity to residences along state highway 127.

    a. Describe Kentucky-American's plans, if any, to mitigate the noise or visual impact on these landowners caused by the construction and operation of the treatment plant.

    b. State whether Kentucky-American has contacted these adjoining landowners to discuss its construction plans. If yes, state the landowners' concerns and describe Kentucky-American's efforts to address these concerns.

**<u>Response</u>:**

a. The placement of the treatment plant on the plant site is designed to mitigate the visual impact on surrounding property owners during construction and operation of the treatment plant, and is only visible from the immediately adjacent residence to the north on KY 127. KAW further plans for vegetation to screen the plant site from that direction. It will be difficult to mitigate noise during construction, however, KAW has designed the facility so that all pumping equipment will be located inside the building, thereby eliminating noise to adjacent property owners.

b. KAW has contacted property owners directly south along KY 127 as part of the communications efforts, but to date has not specifically contacted property owners to the north along KY 127 or talked about specific construction concerns with any adjacent property owners other than the treatment plant site owners. KAW has planned these conversations in conjunction with the easement acquisition phase over the next few months.