Kentucky-American Water Company

2300 Richmond Road • Lexington, Kentucky 40502
(859) 268-6320 • Fax (859) 268-6337

Roy W. Mundy II
President

March 21, 2001

Mr. Thomas M. Dorman
Executive Director
Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40601

Via Hand Delivery

Dear Tom:

In response to your letter dated February 19, 2001, I deliver herewith five (5) copies of the report you have requested from Kentucky-American Water Company.

This report has been prepared in conformity with your directive to include past and future projects of the Kentucky River Authority and activities of other water suppliers in Central Kentucky.

We appreciate the Commission's interest in the adequacy of the water supply for Central Kentucky. As you will see in the enclosed report, there are key questions which have yet to be answered about implementation timing and permitting for any Kentucky River solution. The Kentucky River Authority and the Division of Water are in a unique position to answer these kinds of questions. We therefore respectfully suggest the institution of a proceeding to attempt to resolve unanswered questions in a reasonable time frame. All individuals and entities previously expressing an interest in the problem and all governmental entities whose actions impact the resolution should be invited to participate.

If there is anything we can do to assist the Commission, please let me know.

Very truly yours,

Roy W. Mundy II

cc w/enc.: Gerald E. Wuetcher, Esq.
Richard G. Raff, Esq.

KENTUCKY-AMERICAN WATER COMPANY

REPORT TO THE
KENTUCKY
PUBLIC SERVICE COMMISSION

SOURCE OF SUPPLY AND TREATMENT STATUS

Kentucky-American Water Company

March 19, 2001

Report to Public Service Commission: Efforts to Ensure Adequate Sources of Supply to Meet Customer Demand Through 2020

Brief Summary

This report provides a summary of the activities of Kentucky-American Water Company (KAWC) and other relevant agencies subsequent to the Kentucky Public Service Commission (PSC) Order of August 21, 1997 which directed KAWC 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." KAWC presently has a source of supply deficit of 21 million gallons per day (mgd) during a severe drought, and a reliable production capacity deficit of 11 mgd. Subsequent to the PSC's Order, KAWC's efforts to resolve these deficits focused on a project to deliver treated water supply from the Ohio River. However, on December 9, 1999 the Lexington Fayette Urban County Government Council, which is the governmental body representing 95% of KAWC's customers, passed a resolution calling for a Kentucky River solution to the region's water supply

shortage. In light of the LFUCG's actions, KAWC has pledged its support for the LFUCG's proposed program for resolution of the deficit. Recent activities to enhance the Kentucky River supply are described in this report.

KAWC's proposed future activities are described, and a series of questions in need of answer are presented.

Background

On November 19, 1993 the Kentucky Public Service Commission (PSC) established Case Number 93-434. The purpose of this case was "an investigation into the sources of supply and future demand, including demand side management, of Kentucky-American Water Company."[1] At the time the investigation began, KAWC committed that no work would be done on KAWC's proposed Ohio River solution until the conclusion of the case.

The case was eventually divided into two phases. The file is extensive and provided a thorough review of the source of supply and production capabilities and deficits, as well as a review of the planning methodology and demand projections for KAWC. The PSC issued an order on March 14, 1995, which confirmed the reasonableness of KAWC's demand projections, stating: "Kentucky-American has used reputable source for data and nationally accepted methodologies in developing its demand projections. Over the years, Kentucky-American has made numerous revisions to its methodology for projecting water demand resulting in a state-of-the-art, dynamic process ... further analysis of demand projections would be little more than an academic

exercise."[2] This conclusion was significant in that it firmly established the supply and production capacity needed by KAWC through 2020.

With regard to the source of supply, "the Commission notes that, for approximately the past eight years, Kentucky-American has not had sufficient capacity to meet its customers' unrestricted demand during a drought of record."[3] During the course of the proceeding, the Kentucky River Authority (KRA) indicated that it had contracted with the Kentucky Water Resources Research Institute (KWRRI) to complete a new safe yield analysis of the Kentucky River. The PSC ordered that "Kentucky-American and the KRA should continue their cooperative efforts to obtain a reliable safe yield analysis of the Kentucky River for use in determining whether Kentucky-American needs an alternative source of supply."[4] In a subsequent order dated April 24, 1995, the PSC granted KAWC's petition that the investigation remain open to await a new safe yield analysis of the Kentucky River.[5]

In late 1996, the KWRRI completed its analysis of the Kentucky River which showed an even larger source of supply deficit for KAWC than had been presented earlier in Case No. 93-434. The study determined that there was a basin wide deficit of 9.727 billion gallons over the duration of a drought of record. Of this, 6.579 billion gallons was in Pool 9, the pool from which KAWC withdraws its water supply.

The KWRRI indicated that the basin deficit could be reduced from 9.727 billion gallons to 5.467 billion gallons with the installation of six valves in upstream dams that would allow the transfer of water to downstream pools.

With the valve installation and the proposed valve operating plan, KAWC's deficit could be reduced from 6.579 billion gallons to 3.038 billion gallons over the duration of the drought.[7]

Following the completion of that report, the PSC reopened Case No. 93-434. After extensive additional interrogatories and testimony, the PSC held a hearing on May 21, 1997. Prior to hearing any evidence, the PSC defined the issues: "The only issues before us now are the adequacy of Kentucky-American's sources of supply and the magnitude of any deficit."[8]

In the order dated August 21, 1997, the PSC determined that "additional steps must be taken and financial resources will have to be committed to develop an adequate and reliable source of supply, not only for the customers of Kentucky-American, but for all of the citizens served by the Kentucky River. The evidence further indicates that the net effect of the KRA's proposed activities, if implemented, will be insufficient."[9] The Order went on to state that "the responsibility to develop an adequate source of water supply for Kentucky-American's customers is the direct obligation of Kentucky-American itself."[10] The PSC ordered that "Kentucky-American shall 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."[11]

The Orders in this case established that KAWC was expected to address the water supply needs of its customers. The investigation had clearly defined

the magnitude of the problem by confirming the production capacity deficit and the source of supply deficit. KAWC took its obligation very seriously and undertook the task of resolving the problem.

An Ohio River supply project had been selected by KAWC in 1992 from over 50 alternatives as the most feasible, cost effective solution for the water supply deficits. At that time, KAWC had concluded that a solution to the supply deficit through the expansion of Kentucky River storage pools was unlikely to be achieved within a foreseeable time frame. It was concluded that the raising of the dams, although technically feasible, was likely to encounter severe obstacles, including environmental concerns and funding shortfall. However, KAWC implemented a "decision tree" approach to the resolution of the supply deficit, under which it supported efforts to stabilize and enhance the Kentucky River supply, while concurrently undertaking preliminary activities on an Ohio River supply project to supplement the Kentucky River supply. KAWC's 1992 Least Cost/Comprehensive Planning Study summarizes this approach:

> It is recommended that Kentucky-American continue to follow the "decision tree" approach for resolving its source of supply needs. As summarized in the previous subsection, Kentucky-American should continue to be involved and actively support the regional activities, such as those of the Kentucky River Authority, to construct the proposed dams on the Kentucky River. However, Kentucky-American should not wait an indefinite period for a regional solution to show progress. As the largest water purveyor in the area, Kentucky-American should exercise a leadership role in implementing a source of supply project as necessary. The risk if Kentucky-American takes no action to resolve its source of supply problem is severe, since a drought event would cause service to Kentucky-American's customers to be severely

compromised, and the public health and economic stability of the area would be jeopardized.

Kentucky-American is not able to implement a Kentucky River source project on its own. The participation of the Kentucky River Authority to build new Kentucky River dams, and/or an agreement with Kentucky Utilities to guarantee the availability of Herrington Lake water is needed. At the present time, progress on new Kentucky River dams and/or an agreement with Kentucky Utilities to facilitate an intake in Lock Pool 6 do not appear promising. Kentucky-American should follow its decision tree and continue to proceed with preliminary steps toward implementation of the least-cost feasible project within its control. This project is the construction of a pipeline from the Louisville Water Company." [12]

Subsequently, questions arose among certain stakeholders regarding the magnitude of the supply deficit and KAWC's planned solution. These issues are well documented in previous Commission proceedings, particularly Case Number 92-452. As promised in case 92-452, KAWC suspended work on the Ohio River supply project until the resolution of the issues in Case Number 93-434.

As a first order of business upon receipt of the Commission's Order in Case Number 93-434 dated August 21, 1997, KAWC re-assessed whether significant progress had been made in implementing a Kentucky River supply augmentation during the four years of the ongoing investigation. Unfortunately, significant progress had not been made. The KRA had been able to install valves in four (Dams 11 through 14) of the six dams recommended by the KWRRI study with the ability to transfer water through a fifth (Dam 10). However, no other physical work or engineering investigations to enhance the Kentucky River supply had been undertaken.

The KRA had been established in 1986 to take over the operation of the Kentucky River Locks and Dams 5 through 14 from the United States Army Corps of Engineers. The KRA's mission was expanded in 1990, however, it was not until 1994 that the KRA was provided a means for funding and was able to hire a small staff. Prior to the conclusion of Case No. 93-434, the KRA was able to transfer the ownership of Dam 10 from the Corps to the Commonwealth of Kentucky. However, all other dams were then and still are owned by the Corps. In 1997, the KRA did not have a strategic plan for ownership or stabilization of the dams, nor enhancements to increase water supply. The condition of the foundations and cores of the 100-year old dams was unknown, with no accurate data to confirm the condition of their interior. The KRA had no funding in place to determine the condition of the dams, the extent of deterioration, the environmental impact of any potential enhancements; nor did it have funding for the construction of enhancements. KAWC came to the conclusion that, while the KRA had moved forward since 1993, there appeared to be no way that a solution utilizing only the Kentucky River could be completed within 20 years. Because of that conclusion, KAWC reinitiated work on the Ohio River supply project.

Statement of the Problem

One of the challenges in this process is that there are actually two distinct but integrated problems facing KAWC: a source of supply capacity

deficit and a production (i.e., treatment plant) capacity deficit. These two issues are discussed below.

Source of Supply

KAWC utilizes the Kentucky River for virtually all of its raw water needs. (It uses Jacobson Reservoir (500 million gallon capacity) as a supplemental raw water source during drought or high demand conditions; however, virtually all of the water which re-fills Jacobson Reservoir during the summer months is pumped from the Kentucky River). The amount of water available from the Kentucky River during a severe drought is a combination of river flow and released storage from the upstream river pools. The optimal use of the storage greatly influences the water available over the duration of the drought. KAWC's "safe yield" of the Kentucky River/Jacobson Reservoir system, the maximum single daily volume of water that can be sustained during a drought of record, was determined to be 35 mgd in a 1991 study by Harza Engineering Company.

The Kentucky Division of Water has limited KAWC to withdrawing as little as 30 mgd from the Kentucky River during the most severe drought conditions. The Kentucky Water Resources Research Institute (KWRRI) modeled the Kentucky River using the storage in the pools and calculated a volumetric deficit over the duration of the drought of record. The KAWC volumetric deficit is currently (i.e., as of 2000) 0.968 billion gallons, and will increase to 3.038 billion gallons by 2020 based on customer growth projections. With all of the proposed low level release valves assumed in place,

the total basin-wide deficit would be 3.035 billion gallons, and would grow to 5.467 billion gallons by 2020. Over the 183 days of the drought of record, there will be days when the available supply from the river is greater than 35 mgd, but during the peak of the drought, the water available from the river will be equal to only the safe yield. The cumulative sum of the daily deficits between the drought average day demand and the yield from the river on that day is equal to the volumetric deficit. The actual volume of the deficits is dependent on DOW allocation and release policy, which is continuing to be developed.

The adequacy of the source of supply is determined by comparing the safe yield to the projected demands. KAWC uses a "Drought Average Day" demand calculated from historical usage for planning purposes. The projections take into account the current on-going conservation programs such as public education on outdoor watering, low-flow restrictor giveaways, and increased leak detection. The drought average day projections and deficits for the planning horizon are summarized in Table 1 below:

Source of Supply

Table 1

Year	Drought Average Day Demand[1]	Source of Supply Deficit[2]
2001	56 MGD	21 MGD
2005	57 MGD	22 MGD
2010	58 MGD	23 MGD
2020	60 MGD	25 MGD

1) The projections of the drought average day demand include a 5% reduction from voluntary odd/even watering during a drought.
2) The deficit is based on 35 mgd safe yield (e.g., 2001: 56-35 = 21 mgd)

Production Capacity

The "reliable" or rated capacity of a treatment plant is defined as the maximum permitted production capacity, with the largest single mechanical unit at the plant assumed to be out of service. The Kentucky River Station (KRS) has a rated capacity of 40 mgd. The Richmond Road Station (RRS) has a rated capacity of 25 mgd because of capital improvements made in 1992 that increased the rated capacity from 20 mgd. Therefore, the total combined rated long-term reliable production capacity of KAWC is 65 mgd.

To establish the adequacy of treatment plant capacity, the rated production capacity is compared to the projected single day maximum demand. The demand projections have been recently updated to include 1999 and 2000 actual usage data. These projections include the impact of ongoing

conservation programs such as public education on outdoor watering, low-flow restrictor giveaways, and increased leak detection. The most recent projections and associated capacity deficits are summarized in Table 2. The maximum day projection for 2001 for KAWC is 75.94 mgd. Compared to the reliable plant capacity of 65 mgd, a deficit of approximately 11 mgd exists.

Recognizing that the reliable rated capacity contains several conservative assumptions (e.g., a major equipment failure simultaneous with the worst feasible raw water quality), KAWC and the Drinking Water Branch (DWB), Division of Water of the Kentucky Department of Environmental Protection have engaged in a dialogue concerning the operational capabilities of KAWC's production facilities. In November 2000, DWB granted an approval for the re-rating of KRS to a reliable capacity of 45 mgd during the summer months, provided that water quality standards are maintained. Furthermore, KAWC has demonstrated the capability of producing up to 50 mgd from KRS and 26 mgd from RRS while maintaining good finished water quality. In a letter dated February 26, 2001 the DWB stated that "in instances where a water system must exceed the reliable plant capacity on any given day, the DWB may allow a system to run at the higher rate provided that health standards are met and proper disinfection is maintained. This approval is considered temporary..." In summary, KAWC can produce up to 76 mgd from its production facilities during the summer when demands are high and raw water quality is typically good. Therefore, KAWC will be able to adequately treat the maximum demand projected for 2001. This is also shown on Table 2. The DWB emphasized that

this practice is not a final solution for treatment capacity needs, and that KAWC should continue pursuit of a permanent solution.

KAWC believes that construction of facilities to improve the hydraulics at RRS could be sufficient to temporarily increase the capacity to 30 mgd. KAWC intends to initiate design of these facilities in 2001. The capital project would reinforce the plant's capability to deliver 30 mgd flow through the treatment process. However, the ability to treat 30 mgd will be limited to times when raw water quality is good. In addition, the higher capacity is subject to review and approval by DOW.

Demand Projections and Production Capacity Deficits

Table 2

Year	Projected Peak Day[1] (MGD)	Short-Term Operational		Long-Term Reliable	
		Capacity (MGD)	Surplus/ (Deficit) (MGD)	Capacity (MGD)	Surplus/ (Deficit) (MGD)
2001	75.94	76	0.06	65	(10.94)
2005	77.75	80[2]	2.25	65	(12.75)
2010	80.77	80[2]	(0.77)	65	(15.77)
2020	83.66	80[2]	(3.66)	65	(18.66)

(1) 95% Confidence Interval projection based on Hot. Dry scenario
(2) Increase in capacity is subject to approval by DOW, based on completion of proposed improvements at RRS.

Activities Since Case No. 93-434

Ohio River Supply

At the conclusion of Case No. 93-434, KAWC reviewed the potential alternatives and determined that supply from the Ohio River (via a finished pipeline from Louisville Water Company (LWC)) was still the least cost, most feasible project. KAWC initiated conversations with the Louisville Water Company (LWC) to reconfirm their ability to provide the needed supply, identify key technical issues and begin negotiations on a purchase water contract agreement.

KAWC also worked with LWC to determine the pressure and flow available at the desired connection point. KAWC initiated blending studies to determine that the two waters were compatible and could be mixed without any detectable changes in taste or chemical composition. KAWC developed a comprehensive request for proposal/design concept, which it sent to numerous engineering firms to submit technical and fee proposals. In April 1998, KAWC selected a design engineering team for the project.

KAWC utilized work done prior to Case No. 93-434 that had identified the best route based on feasibility of construction. The pipeline route from Louisville would parallel an existing natural gas pipeline from the Shelby-Jefferson County line through Franklin and Woodford Counties, coming into Fayette County at KAWC's Mercer Road tank. This route would have avoided the historic scenic corridor of Old Frankfort Pike (the route selected prior to

Case 93-434) and would reinforce KAWC's existing distribution system along Leestown Road. Work to identify property owners along the route and contact them for surveying began.

By June 1998, the first objections to the project from property owners became apparent. On August 3, 1998 KAWC representatives made a presentation of the proposed project to the Midway City Council. Several Woodford County property owners were extremely vocal in their protests. The primary concerns were destruction of property due to construction, and the project's potential impact on local growth. KAWC responded that these issues would be mitigated through appropriate construction techniques, and local planning control. Also, KAWC began to look for a pipeline route that might be less objectionable to property owners in Woodford County. A revised route was selected which paralleled Interstate 64. KAWC twice pursued utilizing the interstate right-of-way, but was informed by the Kentucky Transportation Cabinet that it was not possible. This route change caused rework in surveying and route layout, as well as additional costs.

In October 1998, KAWC completed negotiations with LWC. In order to prepare for a Certificate Case, KAWC asked LWC to begin design of its portion of the project to the metering point in Shelby County.

Design and surveying work of the project continued into early 1999. KAWC initiated discussions with the United States Army Corps of Engineers, the Division of Water, Fish and Wildlife officials at both state and federal levels,

and the Kentucky Historic Preservation Office regarding various permits for the pipeline project.

Fayette County Water Supply Planning Council

Concurrent with KAWC's design work was the development of the Fayette County Water Supply Plan, which was mandated of all counties by the Kentucky General Assembly. The Water Supply Planning Council, appointed by the Mayor, undertook the technical review of the information available on the various alternatives. This 16-person group attempted to thoroughly review all of the information available on the alternatives previously considered.

Kentucky-American recognized that greater public awareness of the water supply problem was needed. In 1998, KAWC began developing a community education program that was designed to focus first on conservation, then the water supply needs. This two phase program began in May 1998 and extended for a year.

In July 1999, the Fayette County Water Supply Planning Council adopted a plan to recommend the Ohio River pipeline as the solution for the water supply problem.

Activities of the Lexington Fayette Urban County Government Council

At the beginning of 1999, the opposition to the proposed pipeline intensified, despite the changed route. A citizens' group was formed to organize opposition to the project, focusing on a number of issues including preference for a Kentucky River solution, concerns about Ohio River water quality, and the impact on the region of more growth.

Drought conditions occurred in the summer of 1999, which heightened public awareness of the source of supply deficit. The LFUCG established a series of informational meetings to review the issue and alternatives, and to state its recommended solution to the water supply problem. Since the LFUCG Council represents 95% of KAWC's customers and because the public discussion was becoming contentious, the Company announced that it would stop all work on the Ohio River supply project to cooperate with the LFUCG Council in its analysis.

The LFUCG Council began its efforts in September 1999 by initiating a Technical Advisory Group. The purpose of the group was to establish a consensus on the technical aspects of the issue. This group included representatives from the Division of Water, the Kentucky Geological Survey, the Attorney General's Office, the Fayette County Water Supply Planning Council, the KRA, NOPE, the US Army Corps, the Department of Local Governments, the Water Resources Development Commission, the Bluegrass Area

Development District, the Chamber of Commerce, LFUCG officials, and KAWC. The meetings were facilitated by the KWRRI and were attended by other interested parties including the Sierra Club. The group quickly reached consensus on demand projections similar to projections from Case 93-434, and reached consensus on the magnitude of the deficit. A number of different combinations for Kentucky River enhancements were considered but no single one was decided as the best for the group. A representative of the Sierra Club indicated that the group would likely be opposed to permanently raising any of the Kentucky River dams, but that moveable crest gates on top of the dams might be more acceptable to them. The group began discussing costs of various alternatives, but cost information was less defined for projects other than the Ohio River supply project.

On October 11, 1999 the LFUCG Council met to hear the report back from the technical advisory group. On October 26 the Council met to review project costs including treatment plant costs. The Council continued in its fact-finding efforts, taking a tour of Kentucky River Dam 10 and taking a tour of KAWC's treatment facilities. On November 8, KAWC made its presentation to the council on the Ohio River supply project.

On November 22, Steve Reeder, Executive Director of the KRA, made a presentation regarding the current plans and status of potential projects on the Kentucky River. Mr. Reeder made it clear that regardless of whether or not the Kentucky River supply was enhanced, the dams would have to be stabilized to simply maintain the current supply. The KRA had recently initiated a

geotechnical study to determine the condition of Dam 10. This dam was selected for the first work because it has the largest pool behind it, it is the only dam that the KRA owned at the time, and was considered to be in the best condition. On November 29, the Council heard public comments and a new proposal from regional utilities for a shared treatment capacity solution.

On December 6, the KWRRI made a final presentation, summarizing the process. The presentation discussed both Kentucky River and Ohio River supply. The KWRRI identified the new cost estimate for Dam 10 work of $10 – 44 million from a preliminary report by the KRA's consultant, but did not update the previous overall cost estimate to the Council for the Kentucky River solution, which only used $8 million per dam. The KWRRI stated that "the raising of 3 dams 4 feet (e.g. 9, 10, and 11) and mining pools 12 and 13 to 6 feet is sufficient to meet the projected deficit."[13] This plan had not been and still is not adopted by the KRA, nor does the plan identified by the KWRRI address the entire basin deficit.

On December 9, 1999 the LFUCG Council passed resolution 679-99 which made a series of findings and recommendations in the public interest. The findings included a confirmation of the magnitude of the source of supply and production capacity deficit.[14] A copy of the resolution is attached in Appendix A. The recommendations included:

1. Future water supply for Lexington- Fayette County should come from the Kentucky River because this solution is cost effective, supports a

regional supply effort, supports potential recreation, and ensures the maintenance of the existing water infrastructure.

2. In the 2000 - 2002 time period, the KRA should complete acquisition of Dams 6, 7, 8, 9, and 11, complete the geotechnical study for Dam 10, and complete design for work on Dam 10. The KRA should also complete the environmental assessment of Dam 10, complete a general assessment of all dams to determine the next one for work, and study modifications of East Kentucky Power's intake in Pool 10. KAWC should begin design plans for water treatment plant capacity upgrades to be completed with Dam 10 construction, investigate a regional solution to water supply through a joint effort with the LFUCG and surrounding communities, and develop a conservation and demand management plan. (KAWC has a conservation demand management plan that has been approved by the PSC and DOW, and was utilized in 1999.)
3. In the 2002-2004 time period, the KRA should complete construction work on Dam 10, complete the geotechnical study on Dm 9, complete design on Dam 9, and complete the environmental assessment on Dam 9. KAWC should implement conservation practices and consider demand management options, if necessary.
4. KAWC should start design to increase production capacity by 15 mgd when the KRA can document existing or imminent increased water supply as a result of Kentucky River improvements and/or

management. An additional 5 mgd of production capacity should be available by 2012 if needed.

The resolution also states that the Council will make a reassessment in 2003 of all alternatives, including an Ohio River pipeline if sufficient progress on the improvement is not made. The Council was also to receive a progress report in June 2000, and in each November annually thereafter. The resolution also reaffirmed support of the KRA.

KAWC felt it was prudent to acquiesce to the resolution of the LFUCG because it felt the publicity attendant to the government's process would accelerate the implementation of a solution to the serious supply problem. It remains to be seen whether KAWC's acquiescence will help achieve a timely solution.

1999 Drought

The KRA has drafted a valve operating plan for the use of the valves during a drought. This plan used the KWRRI model to theoretically maximize the release of storage in upstream pools during a drought. When the drought of 1999 occurred, the DOW had not agreed upon the final plan. During the 1999 drought, however, the KRA opened two valves in dams upstream of KAWC's intake to transfer water. This reduced the flow in Pool 11 until no water was going over the dam, which caused some concern for residents in the vicinity of that dam.

As a backdrop to the LFUCG process, the 1999 drought was one of the worst of the century, surpassing the 1953 drought in severity. KAWC requested voluntary odd/even watering by its customers on June 23, mandatory odd/even watering was mandated July 20, and customers were restricted to no outdoor water use from August 12 to October 10, 1999. Over 1000 citations were written for violations in 1999 and numerous businesses and residences were adversely impacted. Industrial customers demonstrated that they have already reduced water usage to a minimum. Discussions were also held to determine how to further reduce water usage should the drought have continued. A drought tariff was drafted and discussed with industrial customers, the Commission, the Attorney General's Office, and the LFUCG.

In 1999, the drought also exposed the deterioration of Dam 9 as more extensive than previously thought. This dam is critical because it backs up the pool that provides KAWC water. Also in 1999, the DOW continued to restrict KAWC's Kentucky River withdrawal to 45 mgd, which could only be met by prohibiting outdoor water usage even after the upstream valves were opened. In 1999, KAWC was also able to confirm the results of the 1991 Aquatic Study by monitoring water quality in the Kentucky River during the low flows. The Aquatic Study had provided technical documentation that some downstream flow requirements could be relaxed during drought conditions with only minimal impact on raw water quality.

In September 1999, the DOW granted KAWC a new withdrawal permit, which eased withdrawal restrictions based on the transfer valves. The new

permit, however, still remained more restrictive than the KRA's valve operating plan.

Recent Regional Activities

Following the Resolution of the LFUCG, KAWC began meeting with regional water utilities to discuss the potential for regional solutions to both raw water supply and treatment capacity deficits. This group has been coordinated by the Bluegrass Area Development District (BGADD) with a KRA member as a facilitator. The Consortium has been working to find common ground on water issues. The group includes Winchester Municipal Utilities, Georgetown Municipal Water and Sewer Service, The City of Nicholasville, the Frankfort Electric and Water Plant Board, the City of Versailles, the LFUCG, and KAWC. The group determined that Frankfort is the only utility with any significant current excess treatment capacity. Further, all entities had a production deficit within the 2020 planning horizon. This deficit is 55 mgd in total. During the process, the City of Paris withdrew from the Consortium and the City of Versailles joined the group. The BGADD made a presentation to the LFUCG on June 27, 2000 explaining the progress of the Consortium.

Another issue that the Consortium members have found common ground on is the withdrawal permit restrictions issued by the DOW. All of the members except Nicholasville have withdrawal restrictions. The restrictions do not appear to be consistent among withdrawers. On February 13, 2001 members met with the DOW and a subsequent meeting was held on March 8.

This dialogue between the region's water providers and DOW has been productive, and is expected to continue.

Recent Kentucky River Activities

On June 21, 2000 the LFUCG Council heard an update from the KRA that it would take at least six years to complete construction on Dam 10 to enhance water supply. The cost was estimated between $12 million and $24 million depending on how the lock structure was addressed.

On July 27-28, 2000, the KRA held its fourth strategic planning session. Included in this session was an update from its consultant, Fuller, Mossbarger, Scott and May (FMSM), who completed the geotechnical study on Dam 10. At that time, the KRA voted to design a stabilization of Dam 10, a permanent raising of the dam rather than crest gates, and a rehabilitation of the lock structure. An alternative design would also be undertaken that would remove the lock structure. The KRA also voted that Dam 9 would be the next dam for a geotechnical study and stabilization work, followed by Dam 8. A representative of the US Army Corps of Engineers indicated at the meeting that they were in a position to turn over the ownership of all dams with conditions to continue ongoing work on Dams 13 and 14 by the end of 2000. The transfer has not been completed to date. The KRA decided not to select a dam for work beyond Dam 8, but developed criteria for selecting the next dam to be worked on based on data to be collected.

A proposed schedule for water supply enhancements was presented by the KWRRI to the LFUCG in 1999 to supply an additional 3.0 billion gallons of

additional water supply to KAWC. This proposed schedule of enhancements is reflected in Table 3. This would include raising Dams 10, 9, 12 and 13. The KWRRI proposed several plans, including raising Dams 9 and 11 while further mining Pools 12 and 13. None of these specific plans has been adopted by the KRA, nor do any of them resolve the total basin deficit.

Potential Schedule for Dam Construction

Table 3

Dam Number	Year to be completed	Height to be raised (Ft)	Volume of additional Water (BG)
10	2006	4	1.0
9(1)	2008	4 (alternate – 2)	0.8 (alternate 0.4)
12	2010	4	0.7
13	2012	4	0.5
		Total Volume	3.0 (alternate 2.6)

(1) Concerns regarding the impact on ferry operations could limit the amount that Dam 9 can be raised.

In October 2000 Congress authorized $2 million dollars for design of rehabilitation of Dam 10. Another $22 million was authorized over the next five years for construction of Dam 10 under the jurisdiction of the Corps. The KRA began negotiating a contract for design with FMSM; however, the KRA announced at its February 16, 2001 meeting that Corps required a longer schedule for design than the KRA had originally projected to meet National Environmental Policy Act compliance. The Corps indicated that it would take 2.5 to 3.5 years before construction could be initiated. Further, the project

cost estimate by the Corps, including their administrative costs, had grown to $37.5 million.

The KRA also has initiated an effort to update the river model, because the Kentucky River did not behave in 1999 as the model predicted. Pool 8 dropped more than anticipated, while downstream pools appeared to have more water than anticipated. The updated model will provide updated data on the safe yield of the river, and the volume of the supply deficit. The designer of the model has indicated that there now is a new computer platform that will allow for easier future adjustments of the model. The KRA is considering the conversion of the model along with the update, which will take 4-6 months. Therefore, the new model is expected to be completed in late summer, 2001.

Proposed Future Activities for Resolving the Source of Supply and Production Deficits

The project(s) to resolve the source of supply and production deficits must be technically viable, and will involve input from many stakeholders.

Through KAWC's aggressive pursuit of a solution to the deficits, a number of milestones in the process have been achieved by both KAWC and other parties:

- Community awareness heightened on the severity of the deficits and magnitude of costs
- Regional utility discussions about common issues regarding regional water supply

- Valves added to the Kentucky River dams, which allow the transfer of water from upstream pools in no flow conditions
- Accelerated geotechnical study of Dam 10 through joint funding
- Federal funding obtained to begin Kentucky River dam rehabilitation
- Identification of the LFUCG defined milestones for water supply issues

KAWC's proposal to resolve the deficits is to continue to follow a "decision tree" that is aligned with the LFUCG resolution of December 9, 1999. An Exhibit illustrating this decision tree approach is attached at the end of this report. The LFUCG resolution clearly states that KAWC, the KRA, and other parties will report on the progress of the solutions on an annual basis and the Council will reassess the direction of the solution in 2003 if sufficient progress has not been made. KAWC has committed to pursue the recommendations of the LFUCG. Since 1999, progress has been made in defining key elements of the Kentucky River supply enhancement program. Based on this information, LFUCG could consider accelerating the decision-making schedule. KAWC supports any efforts to expedite the project(s) which will resolve the deficits.

KAWC has identified the scope of long-term alternatives for resolution of both the treatment capacity and source of supply deficits. However, to alleviate immediate customer needs, KAWC will take short-term measures, which can be implemented quickly.

Short-term

Production Capacity

- KAWC will pursue the hydraulic improvements at the RRS to produce an additional 5 mgd. Construction could be completed in 12- 18 months.
- KAWC has been discussing the potential purchase of finished water from Frankfort Electric & Water Plant Board, if excess capacity of finished water is available. This supplementary supply could provide short-term treatment capacity reliability, additional system reinforcement for a growing area of KAWC's distribution system, and greater system reliability for KAWC and Frankfort.

Source of Supply

- KAWC will also continue to pursue modification of DOW permit restrictions, which limit KAWC withdrawals from the Kentucky River under low flow conditions. This will not require capital expenditures, but must be agreed to by the DOW due to environmental concerns.

Long-term

The resolution to the Source of Supply/Production problem will result from a series of decisions. Each decision will determine a potentially different course of action:

- Completion of the updated model of the River flows will help determine the future course of action. In mid-summer of 2001, the KRA will update the model of the Kentucky River to include 1999 data and determine if the river supply improvements, as proposed, are adequate to solve the

basin deficit. The DOW is involved in the model review and will need to also concur with the results of the model update. KAWC will be providing input on model criteria changes.

- **IF** the model validates that the Kentucky River supply improvements as proposed are adequate to resolve the supply deficit, KAWC should continue with the process development in the timeframe outlined in the LFUCG resolution.
- **IF** the model validates that the river supply improvements as proposed are inadequate or **IF** the DOW does not concur with the basis of the model's conclusions, stakeholders will need to determine if additional enhancements can be made for the river to become adequate (e.g., mining pools, additional capital improvements, or relaxed permit restrictions).
- Completion of the Environmental Impact Statement and design of raising Dam 10 by the KRA's consultant will determine if the dam can feasibly be raised. Additionally, the DOW will need to review and commit to the allocation of any additional storage for KAWC and the entire basin.
- **IF** the dam can feasibly be raised and **IF** all of the water can be used for KAWC's water supply deficit, then KAWC should continue with the process development in the timeframe outlined in the LFUCG resolution.
- **IF** the dam cannot feasibly be raised or **IF** all of the water cannot be used for KAWC's water supply, stakeholders will need to reassess the plan for

Kentucky River enhancements. This includes mining the pools to greater levels, reduction of permit restrictions, and/or increased construction.

- KAWC will encourage the KRA to determine if it is feasible to raise the other dams on the Kentucky River prior to KAWC initiating treatment plant construction in the process development timeframe.
- **IF** the KRA will accelerate the determination and **IF** the dams can feasibly be raised, construction of the treatment plant facilities as outlined in the LFUCG resolution should begin.
- **IF** the KRA will accelerate the determination and **IF** the dams cannot feasibly be raised, stakeholders will need to reassess the plan for Kentucky River enhancements.
- **IF** the KRA cannot accelerate the determination, KAWC should pursue only limited construction of treatment facilities until the determination can be made.

Conclusions

The source of supply and production capacity problems are distinct, but related. The proposal to purchase finished Ohio River water (via a pipeline from Louisville Water Company) would resolve both problems coincidentally. Enhancing the Kentucky River can solve the source of supply deficit. but requires that additional treatment capacity also be constructed.

The project(s) to resolve the source of supply and production deficits must be technically viable, and must be able to be implemented within a reasonable period of time. Through its support and participation toward

making improvements to the Kentucky River which will enhance its supply, KAWC is in partnership with and is dependent upon other entities such as the KRA, DOW, US Army Corps, and LFUCG. KAWC cannot unilaterally implement a project to increase the supply of the Kentucky River. However, KAWC bears the ultimate responsibility to "adequately, dependably and safely supply the total reasonable requirements of its customers under maximum consumption through the year 2020."[11]

The time has come to obtain answers to the following questions:

- Currently approved plans to augment the Kentucky River do not appear to solve the full basin deficit. Will the KRA be able to develop a plan which fully resolves the supply deficit for all users of the Kentucky River?
- Will it be technically feasible, financially practical and environmentally acceptable to raise Dam 10 by four feet? When will this be known? When will the project be completed?
- Will it be technically feasible, financially practical and environmentally acceptable for Dams 9, 10, 12 and 13 to be raised? When will this be known? When will the project be completed?
- How will the financing and schedule of needed stabilization of the dams be impacted by the Kentucky River supply enhancements?
- What portion of the additional supply gained by the raising of upstream dams will the Division of Water allow KAWC to utilize? If and when those projects are completed, to what extent will KAWC customers still be required to restrict usage during periods of low river flow?

- Is the KRA valve operating plan a valid assumption for modeling the availability of supply during a drought? Can operation of the valves during a drought be guaranteed in accordance with the valve operating plan?
- Does the timetable outlined in the LFUCG Resolution provide the most reasonable schedule for solution to the problem? Can it be expedited? Are there conclusions that can be reached without delay? Are there activities which can and should be undertaken more quickly that outlined in the Resolution?

KAWC remains committed to an effective long-term solution to the source of supply and production capacity deficits. KAWC will endeavor to have such a solution implemented as expeditiously as possible. Furthermore, KAWC will continue to exercise a leadership role in achieving the solution. It is unrealistic to expect unanimity among all stakeholders regarding the solution and its implementation, given the diverse interests among stakeholders. KAWC favors a process which allows input from all interested parties, and which has a reasonable path to a solution. KAWC welcomes the Commission's interest in this update, and any follow up activities which would help the process proceed to a conclusion.

1 Order dated November 19, 1993; Page 1

2 Order dated March 14, 1995; Pages 4-5

3 Order dated March 14, 1995; Page 6

4 Order dated March 14, 1995; Page 7

5 Order dated April 24, 1995; Page 4

6 Task V Report – Development and Evaluation of Water Supply Alternatives 7 KWRRI, December 1996; Table A.7

7 Task V Report – Development and Evaluation of Water Supply Alternatives, KWRRI, December 1996; Table B-13

8 May 21 1997 Hearing Transcript; Pages 7-8

9 Order dated August 21, 1997; Page 5

10 Order dated August 21, 1997; Page 6

11 Order dated August 21, 1997; Page 7

12 Kentucky-American Water Company Least Cost/Comprehensive Planning Study – 1992; Pages 3-25 & 3-26

13 Handout KWRRI dated December 6, 1999

14 LFUCG Resolution 679-99 dated December 9, 1999

RESOLUTION NO. 679-99

A RESOLUTION ENDORSING A WATER SUPPLY PLAN FOR LEXINGTON-FAYETTE COUNTY.

WHEREAS, the Urban County Council adopted Resolution 390-99 in July 1999 calling for the Urban County Council to gather information from experts and existing studies about water supply alternatives for Lexington-Fayette County and to endorse a plan for long-term supply; and

WHEREAS, this Council, sitting as a Committee of the Whole, reviewed studies, including the complete report of the Lexington-Fayette Water Supply Planning Council, Harza Report, Kentucky River Basin Water Supply Assessment Study done by the Kentucky Water Resources Research Institute, and others, and heard testimony from experts in the field including the U.S. Army Corps of Engineers, Kentucky Geological Survey, Kentucky Water Resources Research Institute, Kentucky American Water Company, Kentucky River Authority, Office of the Attorney General, interested parties and members of the public; and

WHEREAS, the Urban County Council recognizes the critical importance of an adequate and reliable water supply to guarantee the continued economic growth and health and safety of Fayette County; and

WHEREAS, the drought of 1999 in Lexington-Fayette County and the surrounding region required the imposition of water usage restrictions under a water shortage full alert thereby vividly underscoring the value of water as a precious resource to be protected, conserved and managed and the need to put a plan in place to provide a secure water supply for the future; and

WHEREAS, the Urban County Council recognizes the Kentucky-American Water Company for focusing the attention of the public

APPENDIX A

on the significance of the water supply deficit and water treatment capacity deficit, and for being an active participant in this extensive fact-finding process; and

WHEREAS, the Urban County Council recognizes that any water supply alternative must ensure the highest water quality and least adverse impact to the Kentucky River basin and land environment; and

WHEREAS, efficient water management and sufficient water supply are vital not only to residents in their daily lives, but also to the industry, agriculture, business, horse and livestock farming, recreation and tourism of Lexington-Fayette County; and

WHEREAS, it has long been recognized that the Kentucky River is the most immediate source of water supply for Lexington-Fayette County; and

WHEREAS, the time has come to move ahead with measures to ensure an adequate and sufficient water supply management system, based upon demand projections and the best available assessment of available alternatives.

NOW, THEREFORE, BE IT RESOLVED BY THE COUNCIL OF THE LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT:

Section 1 - That the Lexington-Fayette Urban County Council, based upon its hearings and study, does hereby make the following findings and recommendations in the public interest:

FINDINGS

1. The Council concludes that water supply projections estimate a current water supply deficit under drought of record conditions of approximately one (1) billion gallons in the Lexington-Central Kentucky area growing to potentially approximately three (3) billion gallons by the year 2020.

2. The Council concludes that to maintain unrestricted demand there is a present water treatment capacity deficit of approximately 9.36 million gallons daily (mgd) within the

service area of Kentucky-American Water Company, which is projected to rise to approximately 18-20 million gallons daily by 2020.

3. The Council concludes that a water conservation and demand management plan should be developed to educate the public on water conservation practices to reduce overall water consumption, especially on peak day demands.

4. The Council concludes that any alternative to provide additional water supply and water treatment capacity must be fairly and equitably financed.

RECOMMENDATIONS

1. The Council recommends that future water supply for Lexington-Fayette County should come from the Kentucky River based on its findings that:

a. This solution is cost effective because it can be financed in incremental phases with various funding sources and shared options; and

b. This recommendation supports a regional water supply effort and encourages regional cooperation; and

c. This recommendation supports potential recreation opportunities throughout the region; and

d. This recommendation ensures the maintenance of the existing water infrastructure.

2. The following schedule of improvements as presented by the Kentucky River Authority, Kentucky American Water Company and others should be met within the 2000-2002 time period:

a. Complete acquisition of lock and Dams 6, 7, 8, 9 & 11; and

b. Complete geo-technical study for lock and Dam # 10; and

c. Start and complete engineering design on Dam # 10; and

d. Start and complete environmental assessment of Dam # 10; and

e. Complete a general assessment of locks and dams 5-14 to determine which dam should follow Dam # 10 in rehabilitation effort; and

f. Study modifications to East Kentucky Power intakes; and

g. Begin design plans for water treatment plant capacity upgrades coincident with committed construction funding for Dam # 10; and

h. Investigate a regional solution to long-term water supply through a joint effort between and among the Urban County Government, Kentucky American Water (KAWC), 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; and

i. Develop a mutually agreeable water conservation and demand management plan involving Urban County Government, Kentucky American Water Company, Kentucky River Authority, the University of Kentucky Water Resources Research Institute and the Fayette County Agricultural Extension Office, for educating the public on practices and techniques to reduce water consumption.

3. The following schedule of improvements as presented by the Kentucky River Authority, Kentucky-American Water Company and others should be met within the 2002-2004 time period:

a. Start and complete construction work on Dam # 10; and

b. Start and complete geo-technical study for Dam #9 rehabilitation; and

c. Start and complete engineering design on Dam #9 rehabilitation; and

d. Start and complete environmental assessment on Dam #9 rehabilitation; and

e. Implement conservation practices; and

f. Consider demand management options, if necessary, to meet supply demands.

4. Kentucky American Water should start design to increase water treatment capacity for 15 mgd (million gallons daily) when Kentucky River Authority can document existing or imminent increased water supply as a result of Kentucky River improvements and/or management. An additional 5- mgd treatment capacity should be available by 2012 if needed.

Section 2 - The Urban County Council, in conjunction with the Kentucky River Authority, Kentucky American Water Company and the UK Water Resources Research Institute, will study the success of improving water supply on the Kentucky River, progress on water treatment plant expansion and conservation measures. If sufficient progress on the improvements is not made, a reassessment of all alternatives, including the Ohio River pipeline, and pipelines from regional counties, will be made in 2003. The Council will receive a progress report in June 2000, and in each November annually thereafter.

Section 3 - The Urban County Council recognizes the need for the Kentucky River Authority to act and thereby urges and supports the Authority in its efforts to proceed with all due speed to obtain the monies and/or means to fully undertake the required improvements to existing dams on the Kentucky River.

Section 4 - That the Clerk of the Urban County Council is directed to send a copy of this Resolution, duly adopted, to:

Kentucky Governor Paul Patton; Lexington's delegation to the Kentucky General Assembly: the Kentucky Natural Resources Cabinet - Division of Water; the Kentucky Public Service Commission; the Office of the Attorney General; the Kentucky River Authority; the Lexington-Fayette Water Supply Planning Council; the U.S. Army Corps of Engineers; the Kentucky American Water Company; East Kentucky Power Company; University of Kentucky Water Resources Research Institute; Fayette County Agricultural Extension Office; Winchester Municipal Utilities; Frankfort Plant Board; City of Nicholasville Utilities; City of Paris Utilities; Congressman Hal Rogers, Chair, House of Representatives, Subcommittee on Energy and Water Development, Congressman Ernest Fletcher; and U.S. Senators Mitch McConnell and Jim Bunning.

PASSED URBAN COUNTY COUNCIL: December 9, 1999

/s/ Pam Miller
MAYOR

ATTEST:

/s/ Liz Damrell
CLERK OF URBAN COUNTY COUNCIL

PUBLISHED: December 15, 1999-1t

EWG/res017

Kentucky-American Water Company
Proposed Source of Supply Decision Tree
March 20, 2001