Dinsmore&Shohl LLP
ATTORNEYS

John E. Selent
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October 1, 2007

Via Hand Delivery
Hon. Beth O'Donnell
Executive Director
Public Service Commission
211 Sower Blvd.
Frankfort, KY 40601

Re: ***Application of Kentucky-American Water Company, a/k/a Kentucky American Water for Certificate of Convenience and Public Necessity Authorizing Construction of Kentucky River Station II ("KRS II"), Associated Facilities, and Transmission Line*; Case No. 2007-00134.**

Dear Ms. O'Donnell:

We have enclosed for filing an original and eleven copies of the prefiled rebuttal testimony of Edward Wetzel, Executive Vice President of R. W. Beck, Inc. on behalf Louisville Water Company.

Thank you, and if you have any questions, please call me.

Very Truly Yours,

John E. Selent

JES/ki

Enclosures

cc: All Parties of Record (w/encl.)
Barbara K. Dickens (w/encl.)
Edward T. Depp, Esq. (w/o encl.)

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COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

Application of Kentucky-American Water Company, a/k/a Kentucky American Water for Certificate of Convenience and Public Necessity Authorizing Construction of Kentucky River Station II ("KRS II"), Associated Facilities, and Transmission Line	)	**Case No. 2007-00134**

PREFILED REBUTTAL TESTIMONY OF EDWARD WETZEL
ON BEHALF OF
<u>LOUISVILLE WATER COMPANY</u>

October 1, 2007

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Vice President and General Counsel
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-and-

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Counsel to Louisville Water Company

COMMONWEALTH OF KENTUCKY
BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

Application of Kentucky-American Water Company, a/k/a Kentucky American Water for Certificate of Convenience and Public Necessity Authorizing Construction of Kentucky River Station II ("KRS II"), Associated Facilities, and Transmission Line	))))))	**Case No. 2007-00134**

PREFILED REBUTTAL TESTIMONY OF EDWARD WETZEL
ON BEHALF OF
<u>LOUISVILLE WATER COMPANY</u>

Q. WHAT IS YOUR NAME?

A. My name is Ed Wetzel.

Q. WHO IS YOUR EMPLOYER?

A. I am an Executive Vice President of the independent consulting firm of R. W. Beck, Inc. My office is located at 400 Professional Park Drive, Suite 100, Goodlettsville, Tennessee 37072-2100.

Q. WHAT IS THE BUSINESS OF R. W. BECK, INC.?

A. R. W. Beck was founded in 1942 by Robert. W. Beck and has grown to be a trusted advisor to industry leaders across the country and around the world. It is a group of technically-based business consultants who provide planning, financial, and engineering solutions to the energy, water, and solid waste industries. From R. W. Beck's traditional base of providing professional consulting engineering services in the public utility industry, R. W. Beck has become respected for our ability to resolve complex problems for our clients across several disciplines. We have consistently been included on the list of top engineering and design firms by industry trade publications such as "<u>Project Finance</u>" and <u>"Engineering News Record"</u>. To date, R. W. Beck offers a complete range of consulting engineering services related to the planning, financial analysis, economic analysis, program management, operation, organization, administration and design of water, waste water, storm water, electric, gas, and solid waste facilities.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY TODAY?

A. The Louisville Water Company ("LWC") engaged R. W. Beck to evaluate the costs associated with two alternative means of meeting the water demands of Lexington and surrounding areas of the Commonwealth. (I may sometimes refer to this region generally as "Central Kentucky.") We have evaluated the costs associated with the project for which Kentucky American Water Company ("KAWC") seeks a certificate of public convenience and necessity in this case. We have also evaluated the costs associated with the alternative that has become known as the "Louisville Pipeline." We completed our evaluations of these alternatives on September 18, 2007, and we believe that – in light of some remarks in the testimony of the Attorney General's witness Scott Rubin – it is important to introduce the study evaluating these two alternatives into the record.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND AND PRIOR PROFESSIONAL EXPERIENCE.

A. My educational background and prior professional experience is described in the curriculum vitae attached hereto as Exhibit 1. In short, however, I have a B.S. in Civil Engineering, a M.S. in Civil and Sanitary Engineering, and a Ph.D. in Sanitary Engineering. I am a registered Professional Engineer in Pennsylvania, Florida, and South Carolina, and I hold certification from the National Council of Examiners for Engineering and Surveying ("NCEES"). I have been intimately involved in water system matters ranging in size from a few millions dollar to more than two billion dollars. These projects include water system planning and design, project management, acquisition negotiations, as well as valuation studies and related analyses.

Q. YOU MENTIONED THAT YOU WOULD LIKE TO INTRODUCE A STUDY EVALUATING THE COSTS ASSOCIATED WITH KAWC'S PROPOSAL AND THE LOUISVILLE PIPELINE. IS THAT STUDY ATTACHED TO YOUR TESTIMONY?

A. Yes. That study is entitled "Comparison of the Louisville Pipeline and Pool 3 Options to Serve Central Kentucky Water Customers" (hereinafter the "Report"), and it is attached to my testimony as Exhibit 2.

Q. WAS EXHIBIT 2 PREPARED BY R. W. BECK, EITHER BY YOU OR UNDER YOUR DIRECTION AND CONTROL?

A. Yes.

Q. IS THE INFORMATION OR DATA THAT IS SET FORTH IN EXHIBIT 2 AND UPON WHICH YOU RELIED IN REACHING YOUR OPINIONS AND CONCLUSIONS SET FORTH EXHIBIT 2, THE KIND OF INFORMATION AND DATA THAT EXPERTS IN YOUR FIELD RELY UPON IN REACHING SUCH CONCLUSIONS OR OPINIONS?

A. Yes.

Q. ARE THE CONCLUSIONS OR OPINIONS SET FORTH IN EXHIBIT 2 TRUE AND ACCURATE TO A REASONABLE DEGREE OF CERTAINTY WITHIN YOUR FIELD OF PROFESSIONAL EXPERTISE?

A. Yes.

Q. WHAT WERE THE RESULTS OF YOUR EVALUATION AS REFLECTED IN EXHIBIT 2?

A. Our conclusion was that the Louisville Pipeline is a significantly more cost-effective means of satisfying Central Kentucky's water demands than KAWC's Pool 3 option. On a twenty-year timeframe, the Louisville Pipeline has a present worth cost advantage of approximately ten to twenty percent; a forty-year timeframe shows that the Louisville Pipeline has a present worth cost advantage of closer to 20 to 25 percent. (*See* Report at 6-2.) The Report goes into much greater detail with this analysis, but the bottom-line is that – over the short, medium, and long terms – the Louisville Pipeline is significantly more cost-effective than the KAWC Pool 3 option.

Q. BASED ON YOUR EVALUATION OF THESE ALTERNATIVES, DO YOU AGREE WITH ATTORNEY GENERAL WITNESS RUBIN'S CLAIM THAT "IT ALSO APPEARS THAT THE POOL 3 PROJECT WOULD BE A LOWER COST OPTION FOR KAWC AND ITS CUSTOMERS THAN A FINISHED-WATER PIPELINE TO [LWC]?" (Test. of S. Rubin at 14:5-8.)

A. I do not, however, I do not necessarily fault him for reaching that conclusion as of July 30, 2007, when his testimony was filed. At that time, R. W. Beck had not completed its analysis of the two alternatives. So, there is now much more information "on the table" than perhaps was present at the time. It appears that, at that time, Mr. Rubin was forced to extrapolate estimated costs for the Louisville Pipeline from the figures for KAWC's Pool 3 option. Not only does this show that KAWC had failed to seriously investigate the Louisville Pipeline alternative as of that time, it also shows that Mr. Rubin was attempting to work with the best information available to him at that time.

This does not mean that his information was good information, because we believe the Report shows that it was not. However, we understand that he was effectively operating in a vacuum of information at the time, and we assume he tried to make the best of what little information KAWC's data gave him. Of course, that is why we believe it is so important that the Report be considered in this matter. It does not appear from Mr. Rubin's testimony that KAWC ever made a serious effort to evaluate an alternative such as the Louisville Pipeline, and the Report helps provide that missing piece of the puzzle to the Commission.

Q. YOU SAID THAT MR. RUBIN APPEARS TO HAVE RELIED UPON SOME INFORMATION THAT WAS NOT "GOOD INFORMATION." WHAT DO YOU MEAN BY THAT?

A. I am thinking primarily of one thing when I say that. It appears that Mr. Rubin has assumed that KAWC would own the Louisville Pipeline between the I-64/Highway 53 intersection in Shelbyville and KAWC's transmission main in Lexington. R. W. Beck has assumed public ownership of the pipeline between the I-64/Highway 53 intersection in Shelbyville and KAWC's transmission main in Lexington. Public ownership of the pipeline takes advantage of the lower cost of debt associated with a municipal bond issue, as compared with KAWC's return on rate base. Simply put, there is no hard-and-fast reason to assume that KAWC would own the Louisville Pipeline from Shelbyville to Lexington.

Q. ARE THERE ANY OTHER POINTS THAT YOU WOULD LIKE TO ADDRESS WITH RESPECT TO MR. RUBIN'S TESTIMONY?

A. Yes. There are two last things I would like to address.

First, Mr. Rubin's analysis of the LWC's cost v. the cost of Pool 3 is based on a 42", 50 mile pipeline from LWC. (The specific "to" and "from" was not specified.) The R. W. Beck analysis is based on a 42 mile pipeline. With Mr. Rubin's estimate of $2.5 million per mile, this would be a $20 million difference in capital cost as used in his analysis. With R. W. Beck's estimate of $88 million for a 36", 42 mile pipeline, this would be a $37 million difference in capital costs used in the Rubin analysis.

Second, at page 9, lines 7-8, of Mr. Rubin's testimony, he notes "the prospects for continued growth within the region." (*Id.*) This is an important statement, because it suggests that the Pool 3 facilities will only serve the needs of the area for a finite period of time, perhaps until the year 2030. As shown in the Report, this is true assuming a .5 MGD/year average day demand growth in Central Kentucky. Of course, the Louisville Pipeline would similarly be out of capacity in that same timeframe, but this begs the question of where Central Kentucky turns for Phase 2 of its water supply planning.

I understand that KAWC would propose (at that point) to build a pipeline to the Ohio River to satisfy additional demand. LWC already proposes to supply water from the Ohio River. Costs associated with the construction of a pipeline parallel to an already-installed Louisville Pipeline would be significantly cheaper than the costs associated with the construction of a new Ohio River intake, a raw water pipeline from the Ohio River to Pool 3, expansion of the Pool 3 water treatment plant, and a parallel transmission main from Pool 3 to Lexington. Accordingly, even if the costs for KAWC's Pool 3 option decrease over time, supplementation of that capacity from a new pipeline to the Ohio River would be inordinately expensive in comparison to the construction of a supplementary pipeline parallel to an existing Louisville Pipeline.

At the end of the day, KAWC finds itself in a "Catch 22." As Mr. Rubin agrees, the KAWC Pool 3 option becomes less expensive in relation to the Louisville Pipeline as demand increases. (*See* Test. of S. Rubin at 17:10.) This is not to say that the KAWC Pool 3 option is cheaper; it simply reflects that economies of scale for a treatment plant improve (compared to a wholesale purchase arrangement) as more water is needed. Even still, while the cost differential may narrow over time, it forces the next logical question of what new facilities are required to meet demand once that capacity is exhausted.

In this case, the Ohio River pipeline that KAWC would need to meet that growing demand would cost inordinately more than the parallel pipeline that would be needed under the Louisville Pipeline alternative. This additional expenditure would once again force the cost curves of these alternatives far apart, such that the Louisville Pipeline generally always remains cheaper (even over the long-term) than the KAWC Pool 3 option.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

VERIFICATION

I hereby verify that the foregoing testimony is true and accurate to the best of my knowledge and belief.

Edward Wetzel, PhD, P.E.,
Executive Vice President of R. W. Beck, Inc.

STATE OF TENNESSEE)
)SS
COUNTY OF Davidson)

SUBSCRIBED, SWORN TO AND ACKNOWLEDGED before me by EDWARD WETZEL, to me known, in his capacity as Executive Vice President of R. W. Beck, Inc., this 1st day of October, 2007.

My commission expires: 3/07/11.

Donna R. Farless
Notary Public

DONNA R. FARLESS
STATE OF TENNESSEE NOTARY PUBLIC
DAVIDSON COUNTY
My Comm. Expires March 7, 2011

CERTIFICATE OF SERVICE

It is hereby certified that the Prefiled Rebuttal Testimony of Edward Wetzel on behalf of Louisville Water Company was served via first-class United States mail, sufficient postage prepaid, on the following individuals this 1st day of October, 2007:

Honorable David Jeffrey Barberie
Corporate Counsel
Lexington-Fayette Urban County Government
Department of Law
200 East Main Street
Lexington, KY 40507

Honorable David F. Boehm
Attorney at Law
Boehm, Kurtz & Lowry
36 East Seventh Street
2110 CBLD Building
Cincinnati, OH 45202

Thomas J. FitzGerald
Counsel & Director
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Post Office Box 1070
Frankfort, KY 40602

Honorable Lindsey W. Ingram, III
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Stoll Keenon Ogden PLLC
300 West Vine Street
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Frankfort, KY 40601-8204

Honorable Damon R. Talley
Attorney at Law
P.O. Box 150
Hodgenville, KY 42748-0150

Honorable A.W. Turner, Jr.
Attorney at Law
Kentucky-American Water Company aka Kentucky American Water
2300 Richmond Road
Lexington, KY 40502

Counsel to Louisville Water Company

Dr. Wetzel has served in a variety of academic, technical, project, marketing and management roles over his 30 years of service to water, wastewater and environmental clients. With an emphasis on relationship building and customer satisfaction, he has profitably grown every operation he has been associated with in his career. Dr. Wetzel's experience in utility acquisitions, systems planning, alternative project delivery and program management make him uniquely qualified to provide management and consulting services to the public and private water and wastewater sectors.

Relevant Experience

Dr. Wetzel has managed a variety of projects for municipal clients. Projects include water treatment process studies, water quality investigations, privatization studies, utility acquisitions, rate and connection fee studies, bond reports, resource recovery facility feasibility study, manhole rehabilitation, sewer system modeling, wastewater reuse and wastewater treatment plant design and performance evaluation. He is contributing author to the Water Environment Federation's Manual of Practice No. 8, *Design of Municipal Wastewater Treatment Plants*.

Dr. Wetzel has represented various governments in due diligence investigations and negotiations for the purchase of private utilities. Acquisitions have been both by negotiated agreement and condemnation, with settlements ranging from $3 million to $136 million.

Dr. Wetzel has served client sponsor and led Quality Assurance teams for numerous water and wastewater planning and design projects, including:

- Brunswick County Water and Sewer Authority, NC - $35 million sewage collection and treatment program
- Elizabeth City, NC - $25 million water and sewer improvements
- Gwinnett County, GA - $200 million advanced water reclamation facility design
- City of Chattanooga, TN - $30 million Moccasin Bend wastewater treatment plant wet weather expansion to 260 MGD
- Palm Beach County, FL – improvements at six water treatment facilities, including a new 28 MGD membrane softening plant and the addition of ozone disinfection at a 16 MGD lime softening plant
- Palm Beach County, FL – feasibility investigation for a new solid waste resource recovery facility in western Palm Beach County
- Fulton County, GA – Comprehensive sewer system evaluation survey and rehabilitation program

Water and wastewater master plans have been prepared for Elizabeth City, NC; Palm Beach County, FL; Royal Palm Beach, FL; Town of Palm Beach, FL; Port St. Lucie, FL; Seacoast Utility Authority;

Lehigh University
PhD, Sanitary Engineering

Lehigh University
MS, Civil and Sanitary Engineering

Lafayette College
BS, Civil Engineering

Registrations
Professional Engineer- PA, FL, SC
NCEES Certification

R·W·BECK

Charlotte County, FL; South Brunswick Water and Sewer Authority; Spartanburg County, SC; and Chattanooga, TN.

Program Management experience includes the startup and oversight of several large environmental programs. Activities included project scoping, budgeting, staffing, training, scheduling and quarterly review meetings with senior project staff. Representative programs include:

- South Florida Water Management District, FL - $7.8 B Comprehensive Everglades Restoration Program
- City of Atlanta, GA - $ 2 B Clean Water Atlanta Program
- New York City Dept. of Environmental Protection, NY - $1.4 B Advanced Wastewater Treatment Program
- City of Houston, TX - $1.2 B Greater Houston Wastewater Program
- City of Baton Rouge, LA - $ 600 M Combined Sewer Overflow Abatement Program
- King County, WA - $1.5 B Brightwater Wastewater Expansion Program

Affiliations

American Society of Civil Engineers

American Water Works Association

- Chair, SCAWWA Program Committee

Water Environment Federation

- Member, Task Committee on Aerated, Fixed-Film, Biological Treatment
- Author, *Wastewater Treatment Plant Design*, MOP8

Publications and Reports

Wetzel, E.D., 2006. "Alternative Methods of Capital Project Delivery for Water and Wastewater Utilities," Presentation to the 2006 Water Professionals Conference, Chattanooga, Tennessee.

Wetzel, E.D. and Chapin, R. 2005. "The Utility Workforce- Changes, Challenges and Opportunities," Presentation to the Texas Association of Municipal Sewerage Agencies, Dallas, Texas

Wetzel, E.D., 1996, "Privatization – The Value of Water and Wastewater Utility Systems," Presentation to the 1996 South Carolina Environmental Conference, Myrtle Beach, South Carolina.

Wetzel, E.D., 1996, "Introduction to Contract Operations and Privatization," *Proceedings: 1996 Advanced Topics in Wastewater Treatment*, Greensboro, North Carolina.

Contributing author to *Design of Municipal Wastewater Treatment Plants*. Vols. I and II, Water Environment Federation (MOP8), 1992, 1998.

Nicol, J. Benefield, L.D., Wetzel, E.D., and Heidman, J.A., 1987, "Activated Sludge Systems with Biomass Particle Support Structures," *Biotechnology and Bioengineering*.

Wetzel, E.D., W.I. Fisher, and J.P. Creedon, 1986, "Pilot-Scale Evaluation of A/O vs. Conventional Activated Sludge for High-Strength Industrial Wastewater," *Proceedings for the Industrial Wastes Symposium*, 59th Annual WPCF Convention, Los Angeles.

Wetzel, E.D., A.T. Wallace, L.D. Benefield, and W.G. Characklis, 1986, "Inert Media Biomass Support Structures in Aerated Suspended Growth Systems: An Innovative / Alternative Technology Assessment," *U.S. Environmental Protection Agency, Water Engineering Research Laboratory, Vol. I*

Contributing author to *Fluid Mechanics: Exam File*, S. Klemetson, ed., Engineering Press, 1985.

Wetzel, E.D., 1983, "Users Manual for NEPWATR," *Fritz Engineering Laboratory Report* No. 354.485, Lehigh University.

Wetzel, E. D., and R.L. Johnson, 1983, "Net Energy Production in Wastewater Treatment," *Proceedings of the 1983 Environmental Engineering Division Specialty Conference*, ASCE, 577.

Water and Wastewater System Acquisition Experience

System	Buyer	Price	Services Provided
Century Utilities	Palm Beach County	$ 6 M	Due diligence, negotiation, report, public presentations
Meadowbrook Utilities	Palm Beach County	$ 3 M	Due diligence, negotiation, report, public presentations
Seacoast Utilities	Seacoast Utility Authority	$ 65 M	Due diligence, negotiation, report, public presentations
GDU- Port St. Lucie	St. Lucie County	$ 45 M	Due diligence, report, negotiation, presentations, expert testimony
GDU- Port Charlotte	Charlotte County	$115 M	Due diligence, report, negotiations, presentations, expert testimony
Atlantic Utilities	Sarasota County	$ 17 M	Due diligence, report, negotiations, presentations, expert testimony
Central County Utilities	Sarasota County	$ 14 M	Due diligence, report, negotiations
Meadowood	Sarasota County	$ 3 M	Due diligence, report, negotiations
Venice Gardens	Sarasota County	$ 40 M	Due diligence, report, negotiations
Southbay Utilities	Sarasota County	Did Not Acquire	Due diligence, report, negotiations
Kensington Park Utilities	Sarasota County	Did Not Acquire	Due diligence, report, negotiations
Poinciana Utility System	Florida Governmental Utility Authority	$ 28 M	Due diligence, report, presentations
Golden Gate Utility System	Florida Governmental Utility Authority	$ 29 M	Due diligence, report, presentations

Sarasota Utility System	Florida Governmental Utility Authority	$ 17 M	Due diligence, report, presentations
Barefoot Bay Utility System	Florida Governmental Utility Authority	$ 17 M	Due diligence, report, presentations
Florida Cities Water Company	Lee County	$ 136 M	Due diligence, report, presentations, expert testimony
Tennessee American Water Company	City of Chattanooga	Did Not Acquire	Due diligence, report, presentations expert testimony
Regional consolidation of public systems	Onslow County (NC) Regional Authority	Did Not Occur	Alternatives analysis, valuation, presentations, report
Florida Water Services	City of Marco Island	$ 85 M	Valuation study, presentations, report
Kentucky-American Water System	City of Lexington	Ongoing	Valuation study, presentations
Confidential	St. Tammany Parish	Ongoing	Valuation study, due diligence, report

LOUISVILLE WATER COMPANY
550 SOUTH THIRD STREET • LOUISVILLE, KENTUCKY 40202
TEL 502-569-3600 WWW.LOUISVILLEWATER.COM

September 18, 2007

RECEIVED
SEP 18 2007
PUBLIC SERVICE
COMMISSION

Ms. Beth O'Donnell
Executive Director
Kentucky Public Service Commission
211 Sower Blvd.
P. O. Box 615
Frankfort, KY 40601

Re: Open Records Request Received July 18, 2007

Dear Ms. O'Donnell:

In my Open Records Response dated July 30, 2007, I advised you I would supplement my response should there be any other documents responsive to the Public Service Commission's Open Records Request. Louisville Water Company submits the following supplemental response:

2. All documents (including studies, analyses, and reports) that have been prepared or commissioned since January 1, 1994 and that address the cost, whether known or estimated, to LWC of providing water or water-related services to KAWC.

Response: *In addition to the documents produced in LWC's July 30, 2007 response, please find the following document:*

- *Comparison of the Louisville Pipeline and Pool 3 Options to Serve Central Kentucky Water Customers, Final Report, September 2007*

LWC agrees to further supplement this response should other responsive documents come to our attention. Please contact me at 502/569-0808 if you have questions regarding our response.

Sincerely,

Barbara K. Dickens
Vice President, General Counsel and
Official Custodian of the Records

RECEIVED

SEP 18 2007

PUBLIC SERVICE
COMMISSION

Final Report

Comparison of the Louisville Pipeline and Pool 3 Options to Serve Central Kentucky Water Customers

Louisville Water Company

September 2007

R·W·BECK

Final Report

Comparison of the Louisville Pipeline and Pool 3 Options to Serve Central Kentucky Water Customers

Louisville Water Company

September 2007

R·W·BECK

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Section 1
PROJECT INTRODUCTION

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PROJECT INTRODUCTION

1.1 Background

A number of communities in the Lexington area are facing a long-term water supply shortage resulting from safe yield limitations of the Kentucky River. The major water purveyor in the area, Kentucky American Water Company (KAW), currently receives all of its' raw water from Pool 9 of the Kentucky River. Beginning in the early 1990's, KAW began looking for alternative supplies for future system growth. After evaluation of 50 alternatives, KAW selected an alternative that involved the purchase of treated water from the Louisville Water Company (LWC) and transmission of the water some 75 miles across central Kentucky to Lexington. A purchase and sale agreement was executed between KAW and LWC, but in response to opposition by certain potentially affected stakeholders, KAW determined not to pursue the pipeline project.

A number of the communities surrounding Lexington formed the Bluegrass Water Supply Commission (BWSC) in 2004 with a mission to develop a solution to the long-term water supply problem. Both KAW and the BWSC have analyzed their water supply alternatives over the past few years, and have each decided to pursue Pool 3 of the Kentucky River as the preferred water supply source for the foreseeable future. KAW has recently completed the engineering design and permitting processes for the implementation of a 20 MGD Pool 3 project, and have invited the BWSC to piggyback their project for an additional 5 MGD to serve the needs of their member communities.

Since 2003, the LWC has made four distinct proposals to the BWSC and its' member governments at their request. All proposals established a point of delivery at the intersection of Interstate 64 and KY-53 in Shelby County. These proposals are summarized below:

- August 8, 2003 (amended proposal from July 9)- presented two scenarios, one a 5 MGD base flow and 10 MGD reserve capacity (25 MGD design capacity) and the other a 9 MGD base flow with an 18 MGD reserve capacity (45 MGD design capacity). Fixed costs were assigned for the base flow amount, a separate rate charged up to the reserve capacity, and the wholesale rate charged for usage above the reserve capacity up to the design capacity of the pipeline.
- December 15, 2005- five alternatives were presented, with minimum purchase amounts ranging from 2 MGD to 6.2 MGD, and design capacities ranging from 10 MGD up to 31 MGD. Most alternatives suggested a three-tiered rate structure, with one option involving reserve capacity quantity that varied from the design capacity of the pipeline.

- October 25, 2006- "Tailored Solution" presented to the BWSC, involving multiple minimum daily purchase, reserve capacity and design capacities based on pipeline size and take or pay contract commitments. Three tiered rate structure used that resulted in the lowest effective rate at the limit of the reserve capacity.
- July 10, 2007- simplified solution presented to the Lexington-Fayette Urban County Government (LFUCG). The tiered rate structure was replaced with the standard wholesale water rate (now $1.71/1,000 gallons) for all water consumed. Minimum take-or-pay amount established as approximately 1/5 of pipeline design capacity. Capacities ranged from 10 MGD to 31 MGD, with take-or-pay amounts from 2 MGD to 6 MGD.

LWC understands that the safe yield of Pool 3 on the Kentucky River may not provide adequate capacity to serve the collective water supply needs of Central Kentucky, and the only safe, reliable water supply for Central Kentucky is the Ohio River. Further, LWC understands that KAW determined that the LWC pipeline supply of treated water was the low-cost alternative in the 1990s, and the BWSC determined that the LWC treated water pipeline supply was the low-cost alternative for their needs in 2004. In order to validate previous findings, R.W. Beck has been asked by LWC to perform an independent technical and financial evaluation of an LWC treated water pipeline alternative to the Pool 3 water supply option for Central Kentucky.

1.2 Purpose of the Project

The objective of this study is to develop a life-cycle cost comparison between two alternatives:

Pool 3 Option - Construction and operation of a new intake at Pool 3 of the Kentucky River, water treatment plant, and 30-mile transmission pipeline from Pool 3 to the intersection of Iron Works Pike (KY 1973) and Newtown Pike (KY 922) in Fayette County.

Louisville Pipeline (LWC) Option - Construction and operation of a pipeline from KY 53 in Shelby County to approximately the same point of delivery in Fayette County. In this alternative, the cost of delivery from the LWC to KY 53 is included as the wholesale water rate charged by LWC.

Both alternatives assume a design capacity of 25 MGD, with 20 MGD allocated for KAW customers and 5 MGD for the various BWSC members in Central Kentucky. In the case of the Pool 3 option, the infrastructure will be 80% owned by KAW and 20% owned by the public, while the LWC pipeline is assumed to be 100% in public ownership.

KAW has stated that they believe Pool 3 provides water supply under drought conditions of at least 30 MGD, and that this project will serve the needs of Central Kentucky customers until the year 2030. We have therefore divided our analysis into two phases, one extending to the year 2030 and the other to accommodate growth beyond 2030 to the year 2050.

Section 2
FINANCIAL MODEL AND ASSUMPTIONS

Section 2
FINANCIAL MODEL AND ASSUMPTIONS

The modeling objective is to determine the life-cycle cost impact of the two alternatives on the customers within Central Kentucky. These customers are currently served by both KAW and BWSC member governments. The goal is to analyze the alternatives from both a present-worth cost basis and an annualized cost per 1,000 gallons basis.

There are two major components to any life-cycle cost comparison—capital costs and operating expenses. R.W. Beck did not develop any independent cost estimates for either the capital or operating components of the projects. Much of the cost information was derived from two previously prepared engineering reports:

2. *Final Report for the Water System Regionalization Feasibility Study*, prepared for the Bluegrass Area Development District by O'Brien & Gere Engineers, Inc., February, 2004
3. *Water Supply Study,* prepared for Kentucky American Water Company by Gannett Fleming, Inc., March, 2007

R. W. Beck also reviewed numerous documents provided by LWC, containing Kentucky Public Service Commission testimony and previous presentations by KAW, LWC and O'Brien & Gere on behalf of the BWSC, incorporating the data into the models as appropriate.

2.1 Capital Costs

Capital cost information was obtained from various sources and adjusted to 2007 dollars by the Engineering News Record (ENR) Construction Cost Index. Estimated construction costs were inflated for contingency, and soft costs added for engineering, legal, administrative expenses, permitting, easements and land purchases. The add-on percentages were held consistent with those used by both O'Brien & Gere and Gannett Fleming in their studies. Capitalized interest was charged during an assumed two-year construction period for Phase 1, and issuance costs were assumed for debt financing. Future capital expenditures were inflated by the Handy Whitman index for both pipeline and treatment plant cost elements.

The model translates the capital expenditures into an annual cost allocation by determining the principal and interest on a municipal bond issue for the publicly-financed portions of the project, or applying KAW's after-tax allowable rate of return on their rate base (7.75%).

The following table outlines the capital cost assumptions used as part of the baseline case in the financial model.

Table 2-1
Capital Cost Modeling Assumptions

ENR Construction Cost Index (2007)	7959
Construction contingency	20%
Engineering/legal/administrative	20%
Permitting/easements	5%
Handy Whitman construction inflation rate	3%
Municipal bond interest rate	4.7%
KAW interest rate on debt	6.5%
KAW return on rate base	7.75%

2.2 Operation and Maintenance Costs

In addition to the capital costs of the project, the model also considers the operation and maintenance costs of the two alternatives. For the Pool 3 option, this includes the labor, chemical, power and other miscellaneous expenses associated with operating and maintaining the new intake, treatment plant, transmission main and booster pump station. In the case of the LWC option, the O&M expense of operating the transmission main and booster pump station from KY 53 to Fayette County includes electrical costs and an allowance for line maintenance. The O&M costs are inflated each year by the rate of inflation, assumed to be 2.4% in the model.

The water delivered by LWC to the KY 53 point of connection in Shelby County is provided at the wholesale water rate, currently $1.71/1,000 gallons, plus an annual meter service charge. The cost to deliver treated water in full compliance with all regulatory requirements is imbedded in that rate, which will increase from time to time. Over the past 15 years, the average increase in the LWC wholesale rate has been 2%. The model assumes an annual increase in the wholesale rate of 3%.

2.3 Renewal and Replacement

In order to ensure sustainability of the newly-constructed assets, the model assumes an annual cost for infrastructure renewal and replacement (R&R). The costs assume an average asset life of 75 years for pipelines, and 40 years for treatment plants and associated equipment. Therefore, the R&R funding is established at 1.33% and 2.5% of the total project costs for the transmission and plant elements, respectively. This same approach is utilized for determining the depreciation on the KAW assets.

2.4 Model Output

The financial model generates results in two basic ways. First, a present worth cost is determined by taking the annual cost for each year over the timeframe modeled, and discounting back to 2007 using an assumed discount rate of 4.7% based on the opportunity cost of capital to the impacted customers. The difference in the present worth cost represents the difference paid by the end users for the two alternatives over the 20 or 40-years of operation in today's dollars.

The second output from the model is a plot of the cost per 1,000 gallons over the timeframe analyzed. This approach provides a more graphical representation of the financial impacts to customers over time for the two alternatives.

Section 3
PHASE 1 (2030) ANALYSIS

3.2 Operation and Maintenance (O&M) Expenses

The operating costs for the Pool 3 river intake, water treatment plant and transmission pipeline were obtained from KAW estimates for labor, power, chemicals, and security as detailed in testimony before the Kentucky Public Service Commission in March of 2007. An allowance was also made for ongoing maintenance expenses. At the initial flow rate of 6 MGD, these costs totaled $0.98/1,000 gallons. Additional operating expenses for the Pool 3 option included the payment of property taxes by KAW and the Kentucky River Authority (KRA) withdrawal fee of approximately $0.05/1,000 gallons.

O&M expenses for the LWC pipeline include power and maintenance costs for the pipeline, an annual metering charge from LWC, and the wholesale rate charge from LWC, currently at $1.71/1,000 gallons of usage. For consistency, the KRA withdrawal fee of $0.05/1000 gallons was also charged as an operating cost in the LWC pipeline option.

3.3 Modeling Results

The Pool 3 option has been described in various documents and reports as both a peaking plant as well as to provide capacity for future regional population growth needs. Under the peaking plant concept, the facilities would normally operate under some minimal flow condition (6 MGD), but be available to provide up to its' peak capacity under severe drought conditions. As an integral part of the water supply solution for the region, the Pool 3 plant flows would increase as the population of the region and water needs increased over time.

Two baseline cases were therefore studied in the modeling effort. The first assumes that the initial volume of water delivered through either the Pool 3 or LWC option is 6 MGD and remains constant through the year 2030. A second analysis accounts for customer growth and assumes that the average volume of water delivered starts at 6 MGD and increases by 0.5 MGD each year from 2010 until 2030. Under this assumption, the average daily flow in 2030 would be 16 MGD. With a peak day to average day ratio of about 1.6, this rate of flow increase depletes the new system capacity of 25 MGD by the year 2030.

The present worth cost of the Pool 3 and LWC pipeline options are compared below.

Table 3-2
Capital Costs - Pool Three Option (2007 $1,000)

Intake, Pump Station and Treatment Plant	$ 54,867
Raw Water Main	402
42" Transmission Pipeline	48,300
Booster Pump Station/Storage tank	4,743
Construction Cost Estimate	$108,312
Contingency @ 20%	21,662
Probable Construction Cost	$129,974
Permitting/Easements @ 5%	6,499
Engineering, Legal, and Administrative @ 20%	25,995
Land	788
Subtotal- Capital Cost	$163,256
Capitalized Interest @ 6.5% for two years	3,183
Issuance Costs @ 1% of long-term debt	980
Total Pool 3 Phase 1 Project Cost	**$167,419**

Table 3-3
Capital Costs - Pool Three Option
UV Capital Expenditure (2011 $1,000)

UV Disinfection Costs	$ 5,355
Contingency @ 20%	1,070
Probable Construction Cost	$ 6,425
Permitting @ 5%	321
Engineering, Legal, and Administrative @ 20%	1,285
Subtotal- Capital Cost	$ 8,031
Capitalized Interest @ 6.5% for two years	261
Issuance Cost @ 1% of long-term debt	80
Total UV Project Cost	**$ 8,372**

3.1 Initial Capital Expenditure Assumptions

The following capital costs were used in developing the models for the Pool 3 and LWC pipeline options.

Table 3-1
Capital Costs - LWC Option (2007 $1,000)

42" Transmission Pipeline (incl. KY river crossing)	$ 68,280
Booster Pump Station/Storage Tank	4,743
Construction Cost Estimate	$ 73,023
Contingency @ 20%	14,605
Probable Construction Cost	$ 87,628
Permitting/Easements @ 5%	4,381
Engineering, Legal, and Administrative @ 20%	17,526
Land	87
Subtotal- Capital Cost	$109,622
Capitalized Interest @ 4.7% for two years	2,576
Issuance Costs @ 1%	1,096
Total LWC Phase 1 Project Cost	**$113,294**

Section 3
PHASE 1 (2030) ANALYSIS

The first phase of the investigation was to perform a financial analysis of two alternatives:

1. Kentucky River Pool 3 option, involving a 25 MGD intake, water treatment plant and high-service pump station at Pool 3, and a 30 mile, 42-inch transmission main from the treatment plant to the connection to the KAW system at Iron Works Road (KY 1973) and Newtown Pike (KY 922) in Fayette County.
2. A 42 mile, 42-inch finished water transmission main from KY 53 in Shelby County, along the I-64 corridor to approximately the same point of connection with the KAW system in Fayette County.

Both of the above alternatives include a booster pump station and a 3 million gallon storage tank along the transmission pipeline route, including the land acquisition costs.

The analysis for each alternative includes the capital construction cost in 2007 dollars, plus the operating and maintenance (O&M) expenses over 20 years starting in 2010. This initial investigation (Phase 1) is expected to provide a 20-year solution, assuming that Pool 3 can sustain a 30 MGD withdrawal under peak day flow conditions, and that customer growth will result in approximately 0.5 MGD of additional flow each year from an initial value of 6 MGD.

The wholesale rate from LWC is initially $1.71/1,000 gallons, and inflates at 3% per year through 2030. Both the Pool 3 and LWC pipeline options include the Kentucky River Authority withdrawal permit fee of $0.05/1,000 gallons. The Pool 3 alternative also includes a capital project to address the Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR), published by the U.S. EPA in the Federal Register on January 6, 2006 with a 2012 compliance deadline. For the purpose of this investigation, we have assumed that the Pool 3 treatment plant will require an additional 1-log inactivation of Cryptosporidium, and that the likely technology to achieve the additional treatment credit will be with ultraviolet light (UV). The costs for UV disinfection were estimated in the March 2007 Gannett Fleming report and are included in the Pool 3 model assuming an installation date of 2011. Investments in the LWC system to comply with future drinking water regulations are included in the future increases in their wholesale rate.

Table 3-4
Comparison of Present Worth Costs
2010-2030 Analysis ($1,000)

	Constant Flow 6 MGD	Increasing Flow 0.5 MGD/yr
Pool 3 Option	$ 316,518	$ 326,431
LWC Option	$ 250,258	$ 297,688
Difference	$ 66,260	$ 28743
%	21%	9%

The model also compares the two options on a cost per 1,000 gallons basis. Figure 3-1 and 3-2 plot the cost of each option over the 20-year analysis period for the two baseline cases. When the flow rates remain constant, the Louisville pipeline option is always less expensive on a unit cost basis as shown in Figure 3-1. The LWC option curve goes up because both the operating expenses and the wholesale rate are increasing. The Pool 3 option curve goes down because asset depreciation is reducing the return to KAW on their portion of the project, and that reduction is greater than the increases in operating expenses. After 20 years, the municipal revenue bonds used to fund the LWC pipeline and 20% of the Pool 3 option are retired, which will reduce the unit costs in 2030 to below $4/1,000 gallons for LWC and below $10/1,000 gallons for Pool 3.

Figure 3-1
Unit Cost Comparison (6 MGD Constant)

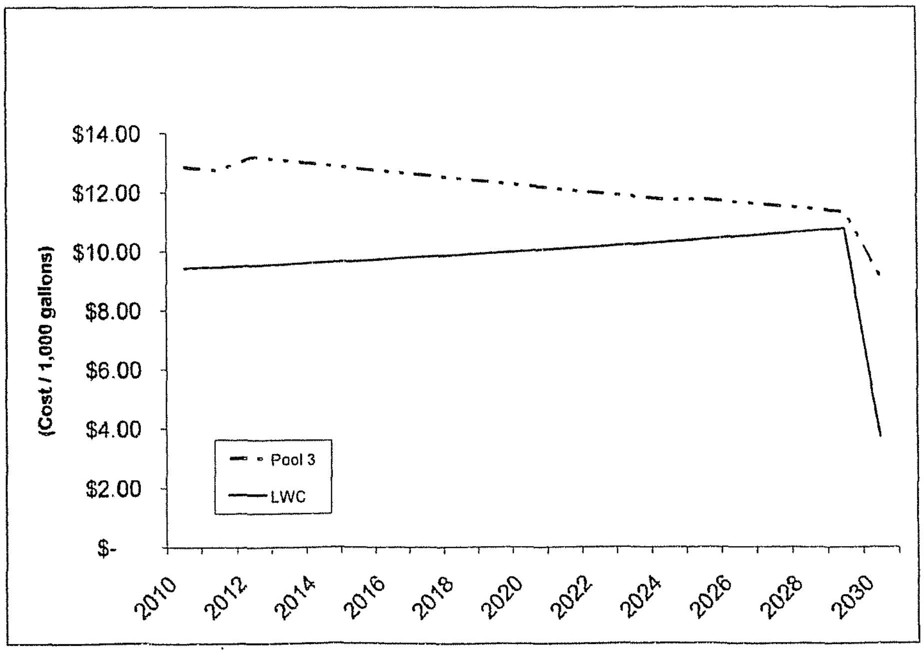
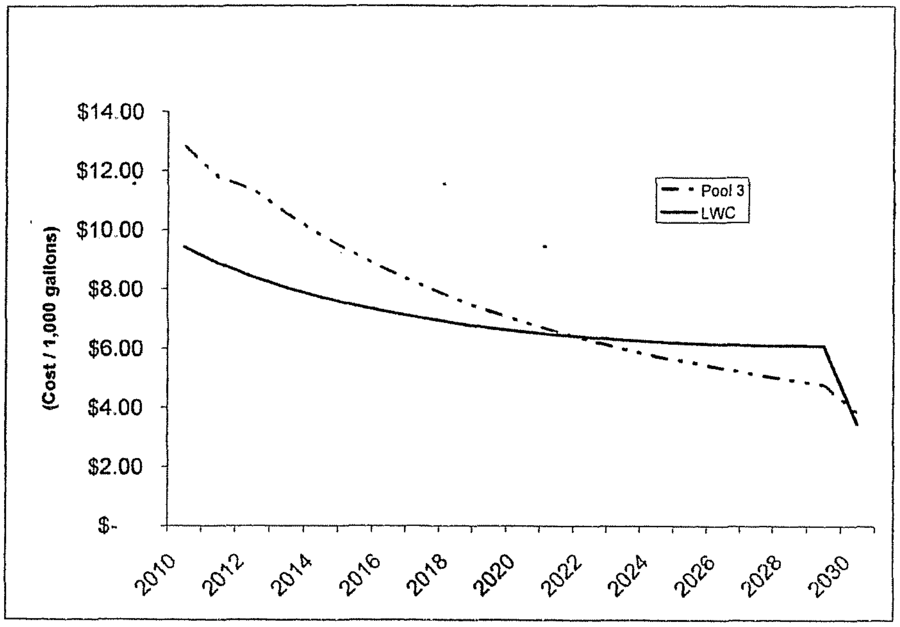


Figure 3-2 compares Pool 3 with LWC when flows are increasing by 0.5 MGD per year from the initial 6 MGD in 2010. In this instance, both curves show a decrease in the unit cost over time, although the Pool 3 option reduces faster than the LWC option because of the impact of depreciation on the KAW return on invested capital. This causes the two curves to cross around the year 2022, but the life-cycle, present worth cost of the Pool 3 option is still nearly $30 million more expensive over 20 years.

Figure 3-2
Unit Cost Comparison (0.5 MGD / yr Increase)



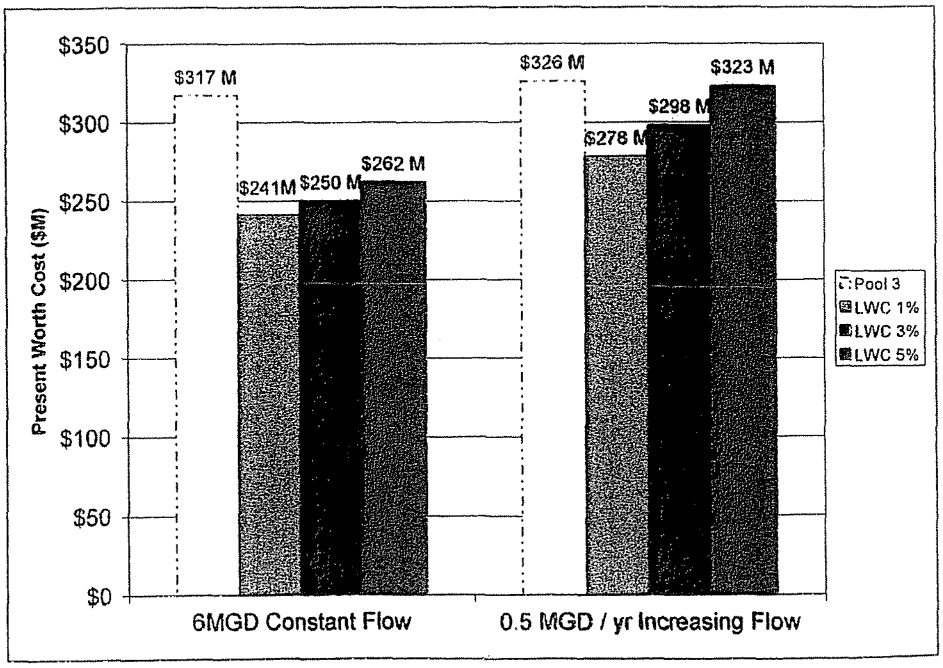
3.4 Sensitivity to LWC Wholesale Rate

The most significant variable in the analysis is the assumed increase in the rate charged by Louisville Water Company to its' wholesale customers. Over the past 15 years, the LWC wholesale rate has increased by an average of 2%. The baseline case presented above assumed an annual increase of the wholesale rate of 3% from the current rate of $1.71/1,000 gallons purchased. The model was used to analyze the effect of varying the future rate increases from 1% to 5% per year over 20 years.

The lower increase of 1% was chosen to reflect the potential that selling wholesale water to Central Kentucky customers spreads the fixed cost of operation across a larger volume of water distributed, and could result in rate increases below the 2% per year average over the past 15 years. The upper limit of 5% recognizes the potential that addition of enhanced treatment at both the Crescent Hill and B.E. Payne treatment plants to meet the 2012 regulations could cause a short-term wholesale rate increase above the rate of inflation.

Figure 3-3 presents the present worth cost of each alternative through the year 2030. The results indicate that at a 6 MGD constant flow rate, the difference between the Pool 3 option and the LWC option ranges from $76 million at 1% annual increase to $54 million at a 5% annual increase. The second set of plots show the same comparison for the 0.5 MGD per year flow increase. In this case, the LWC option is lower on a present worth basis by $48 million at 1% annual increase in the wholesale rate, down to a $3.5 million advantage at a 5% increase.

Figure 3-3
Phase 1 (2030) Present Worth Cost Comparison



Figures 3-4 and 3-5 present the unit cost of each option with separate curves presented for 1%, 3% and 5% wholesale rate increases from LWC. At a constant flow rate of 6 MGD, the unit costs for the LWC option are significantly less than the Pool 3 option over the 20-year analysis period. Only when the wholesale rate increases at 5% per year does the unit cost of the LWC option ever exceed that of Pool 3, and that does not occur until almost 2027 as shown on Figure 3-4. Figure 3-5 presents the unit cost comparison assuming the 0.5 MGD per year flow increase. In this instance, all LWC curves eventually cross the Pool 3 option. Nevertheless, the present worth costs remain lower for LWC under all assumed rate increases over the 20-year analysis period.

Figure 3-4
Unit Cost Comparison (6 MGD Constant)

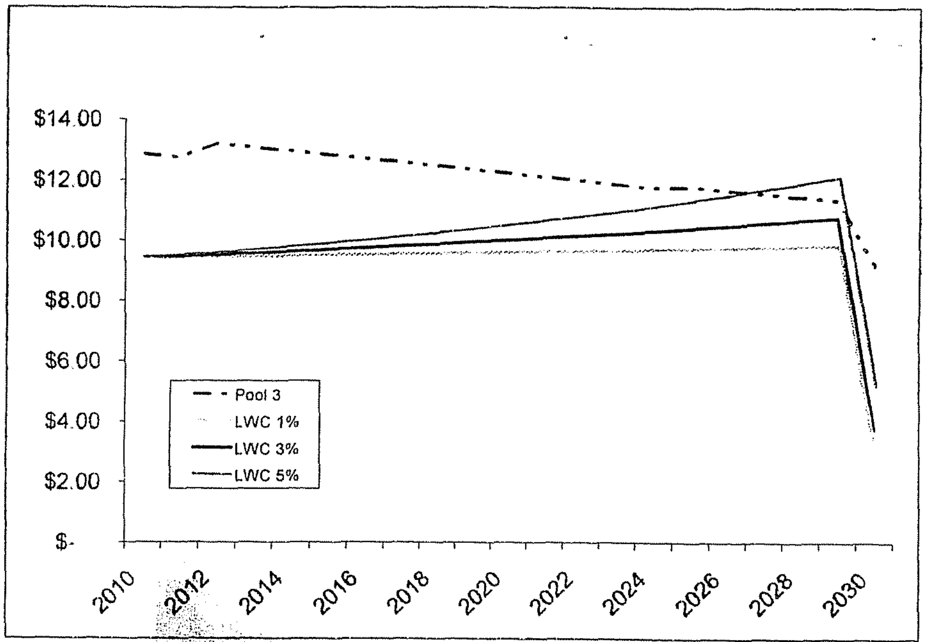
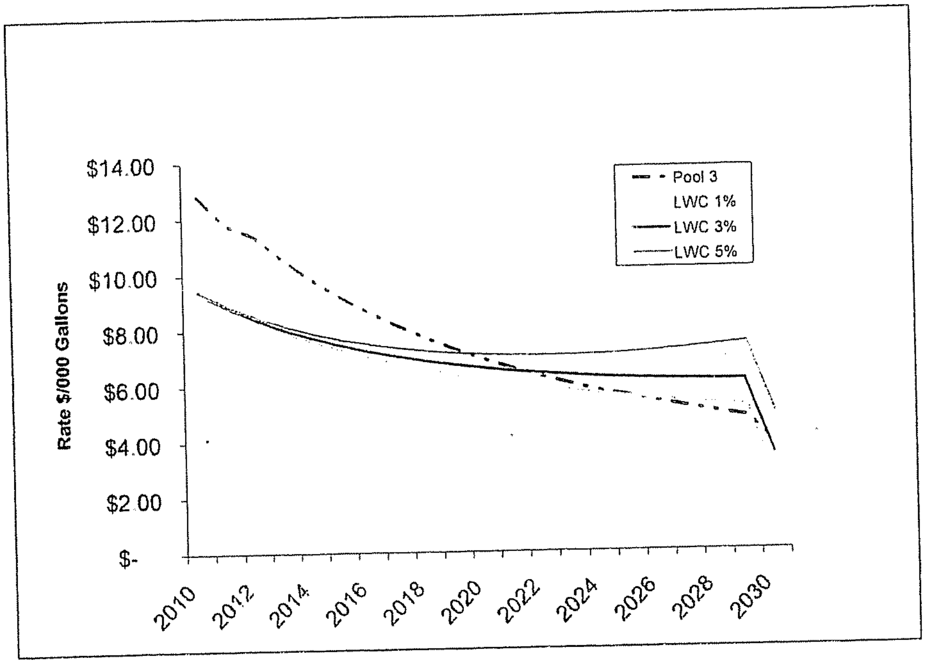


Figure 3-5
Unit Cost Comparison (0.5 MGD / yr Increase)



Section 4
PHASE 2 (2050) ANALYSIS

R W BECK

Section 4
PHASE 2 (2050) ANALYSIS

Previous studies acknowledge that a Pool 3 solution on the Kentucky River is likely a 20 to 25-year solution based on projected regional growth and an assumed 30 MGD of available capacity. The recommended Kentucky River solution outlined in the O'Brien & Gere study contemplated a second phase raw water pipeline to the Ohio River from Pool 3 at some point in the future.

Given the need for source water from the Ohio River, our Phase 2 investigation analyzes options to expand on the initial 25 MGD plan. If we assume that demand continues to increase by 0.5 MGD each year, phase 2 options will need to provide an additional 10 MGD average flow over that timeframe, for a total peak capacity of 45 MGD. Since the previously constructed 42-inch transmission mains can carry up to 31 MGD, the additional 14 MGD can be accommodated with a 30-inch diameter line for both the new raw water main and the parallel treated water transmission lines in both alternatives.

Phase 2 of the Pool 3 option will therefore include the following capital components:

- Construction of a new 15 MGD river intake and raw water pump station in the Ohio River
- Construction of a new 30 mile, 30-inch raw water main from the Ohio River to the Pool 3 WTP
- Expansion of the treatment plant and associated facilities to 45 mgd
- Construction of a parallel 30-inch transmission main from Pool 3 to Lexington
- Addition of a new booster pump station for the 30-inch treated water main
- Addition of a new 2 million gallon storage tank along the 30-inch pipeline route

Phase 2 of the LWC pipeline option will include:

- Construction of a parallel 30-inch transmission main from Shelbyville to Lexington
- Addition of a new booster pump station for the 30-inch main
- Addition of a new 2 million gallon storage tank along the 30-inch pipeline route

Since the current peak day capacity of the LWC treatment plants is 240 MGD, one or both of their plants will need to be expanded by at least 10 MGD by 2030 to accommodate the 45 MGD peak day flow for Central Kentucky. LWC has indicated they will increase the capacity of the B.E. Payne plant by 15 to 30 MGD before 2030, and those costs will be reflected in the wholesale rate.

4.1 Phase 2 Capital Costs

Since the system capacity is needed before 2030, the capital components outlined above must be designed and constructed prior to that date. The model assumes design and construction over a three-year period starting in 2025.

The following capital costs were used in developing the models for the Pool 3 and LWC pipeline options in Phase 2. All costs shown are in 2007 dollars. These costs were inflated to 2025 at an assumed 3% construction cost inflation rate and input into the model.

Table 4-1
Phase 2 Capital Costs - LWC Option (2007 $1,000)

Transmission Pipeline (incl. KY river crossing)	$ 50,909
Booster Pump Station/Storage Tank	3,165
Construction Cost Estimate	$ 54,074
Contingency @ 20%	10,815
Probable Construction Cost	$ 64,889
Permitting/Easements @ 5%	3,244
Engineering, Legal, and Administrative @ 20%	12,978
Subtotal- Capital Cost	$ 81,111
Capitalized Interest @ 4.7% for two years	1,525
Issuance Costs @ 1% of long-term debt	826
Total LWC Phase 2 Project Cost	**$ 83,462**

Table 4-2
Phase 2 Capital Costs - Pool Three Option (2007 $1,000)

Ohio River Intake and pump station	$ 3,774
Raw Water Main	34,060
Treatment plant expansion	35,765
Transmission Pipeline	34,060
Booster Pump Station/Storage tank	3,165
Land	200
Construction Cost Estimate	$111,024
Contingency @ 20%	22,165
Probable Construction Cost	$133,189
Permitting/Easements @ 5%	6,659
Engineering, Legal, and Administrative @ 20%	26,638
Subtotal- Capital Cost	$166,486
Capitalized Interest @ 6.5% for two years	3,871
Issuance Costs @ 1% of long-term debt	998
Total Pool 3 Phase 2 Project Cost	**$171,355**

4.2 Operation and Maintenance Expenses

O&M expenses in phase 2 were computed in similar fashion as was done for Phase 1. Two additional staff are assumed for the new Ohio River intake and raw water pump station facilities. Other fixed treatment plant costs were increased by the rate of inflation, while variable costs increased by both the rate of inflation and flow rate. Wholesale rate increases were once again assumed at 3% per year to be consistent with the assumed rate of inflation and construction cost increases.

4.3 Modeling Results

The model was run through the year 2050 under two distinct scenarios.

1. Both the Pool 3 and LWC option continue to provide 6 MGD on an average day basis throughout the analysis period. Under this scenario, the second phase of capacity expansion is not constructed.

2. Increasing flows by 0.5 MGD per year require an expansion to increase the capacity of each option to 45 MGD to accommodate future flows through the year 2050.

The table below presents the present worth cost comparison of the two options for each scenario. Note that when the analysis is extended beyond the initial 20-year analysis period, the LWC option becomes more attractive under either scenario presented.

Table 4-3
Comparison of Present Worth Costs
2010-2050 Analysis ($1,000)

	Constant Flow 6 MGD	Increasing Flow 0.5 MGD/yr
Pool 3 Option	$ 394,570	$ 625,743
LWC Option	$ 296,948	$ 508,962
Difference	$ 97,622	$ 116,781
%	25%	19%

The same unit cost comparison was analyzed as was done for Phase 1 and presented in Section 3. Figures 4-1 and 4-2 provide the unit cost curves for the 40-year analysis period for the constant flow and increasing flow scenarios.

Figure 4-1
Unit Cost Comparison (6 MGD Constant)

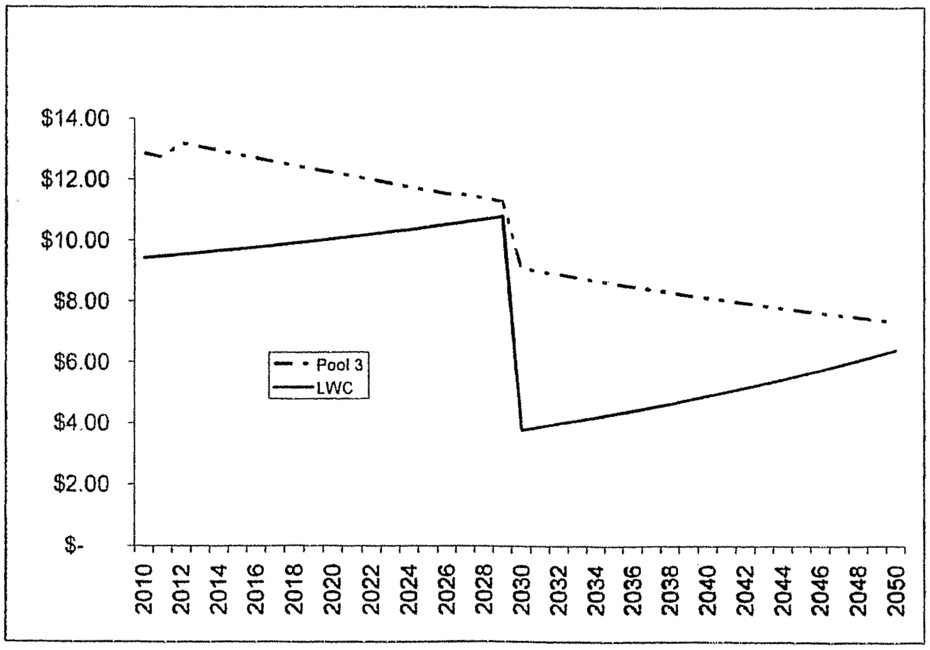
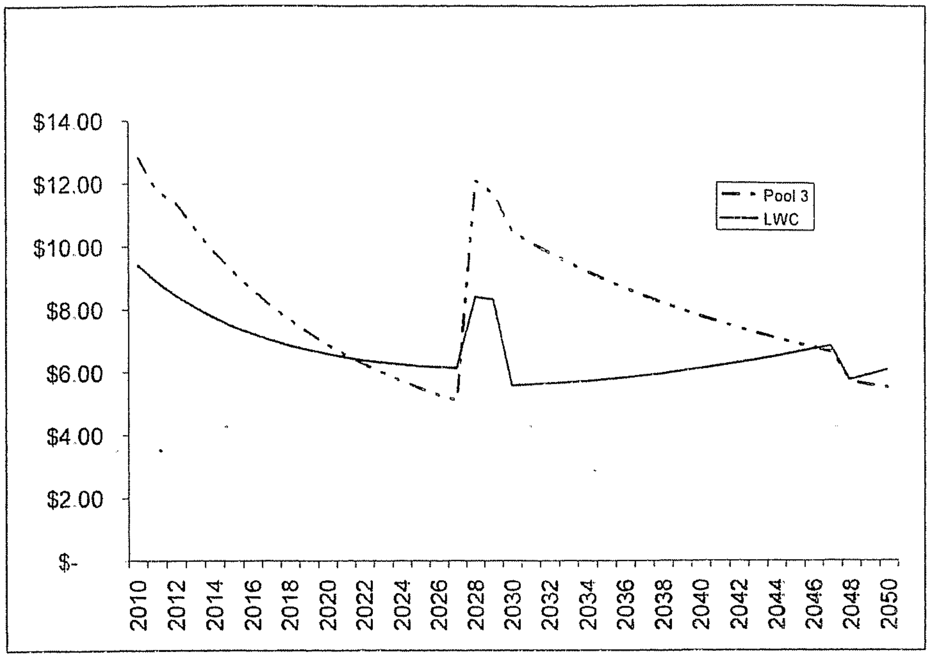


Figure 4-2
Unit Cost Comparison (0.5 MGD Increase)



Section 5
ALTERNATIVE LWC PIPELINE PROPOSAL

R·W·BECK

Section 5
ALTERNATIVE LWC PIPELINE PROPOSAL

Louisville Water Company believes that delivering up to 25 MGD from Louisville can be accomplished with a 36-inch pipeline rather than the 42-inch pipe utilized in the modeling effort. The reason for using a 42-inch pipeline, our model from Shelby County was to have an "apples-to-apples comparison" between the Pool 3 project and the LWC option. The 42-inch pipeline was chosen to transport the water from the Pool 3 facility to Fayette County in order to maintain water velocity below a nominal 5 feet per second (fps) at up to a 30 MGD flow rate. The larger diameter pipe also dissipates less energy (head loss) over the length of pipeline to be constructed, thereby reducing the need for additional booster pumping and lowering power costs to transport the water.

R.W. Beck was asked to consider the viability of a 36-inch pipeline for this project. While a detailed engineering study of the pipeline plan and profile would be required to fully understand the issues surrounding the use of a smaller pipeline, it appears the 36-inch alternative has merit in this application for the following reasons:

1. Given the lower cost of a 36-inch pipe, the total project cost could be as much as 20% less than the 42-inch option modeled based on lower construction costs and if lower contingencies and engineering cost assumptions are used;
2. The 5 fps velocity criterion is violated when flows exceed 23 MGD, which would occur only under the most severe peak flow conditions anticipated (at 25 MGD the velocity is 5.5 fps); and
3. Energy loss across the pipeline is about twice as large for the 36-inch versus the 42-inch pipeline, which will likely require an additional booster pumping station and higher electrical costs to operate.

5.1 Capital Costs

The following capital costs were used as input to the financial model for an assumed 36-inch pipeline alternative from Shelby County to Fayette County. This alternative includes an additional booster pump station along the pipeline alignment, but also includes lower contingency and engineering costs typically associated with pipeline projects. The total project cost for the 36-inch alternative is $25 million (22%) less than the cost for the 42-inch pipeline.

Table 5-1
Capital Costs of 36" LWC Pipeline

Transmission Pipeline (incl. KY river crossing)	$ 57,140
Storage Tank	2,165
Booster Pump Station (2)	5,155
Construction Cost Estimate	$ 64,460
Contingency @ 10%	6,446
Probable Construction Cost	$ 70,906
Permitting/Easements @ 5%	3,545
Engineering, Legal, and Administrative @ 15%	10,636
Land	150
Subtotal- Capital Cost	$ 85,237
Capitalized Interest @ 4.7% for two years	2,003
Issuance Costs @ 1%	853
Total LWC Phase 1 Project Cost	**$ 88,093**

5.2 Operation and Maintenance Expenses

O&M expenses are generally assumed to be the same for the 36-inch pipeline with the exception of power costs. Given that the head loss doubles in the 36-inch alternative, the power costs were assumed to double in this option as well.

5.3 Modeling Results

The model was once again run under two scenarios for the 36-inch pipeline. The first scenario holds the flow rate constant at 6 MGD over the 20-year operating period, and the second increases the average flow by 0.5 MGD per year. The present worth cost of the Pool 3 and 36-inch LWC pipeline projects are compared below.

Table 5-2
Comparison of Present Worth Costs
2010-2030 Analysis ($1,000)

	Constant Flow 6 MGD	Increasing Flow 0.5 MGD/yr
Pool 3 Option	$ 316,518	$ 326,431
36-inch LWC Option	$ 211,614	$ 261,078
Difference	$ 104,904	$ 65,353
%	33%	20%

Figure 5-1 presents the present worth costs for the Pool 3 option and both LWC options under both scenarios. A comparison was also made between the unit costs of the three options for both scenarios as shown on Figures 5-2 and 5-3. These results clearly demonstrate the benefits of using the smaller diameter pipeline to deliver water from Louisville to Central Kentucky, and the enhanced benefit of that alternative over the Pool 3 option.

Figure 5-1
Phase 1 (2030) Present Worth Cost Comparison

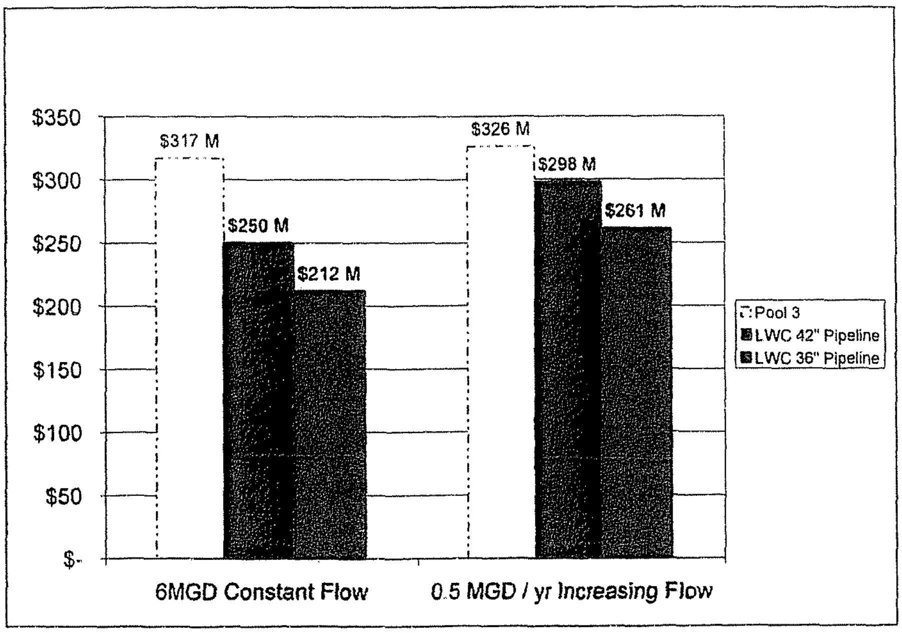


Figure 5-2
Unit Cost comparison (6 MGD Constant)

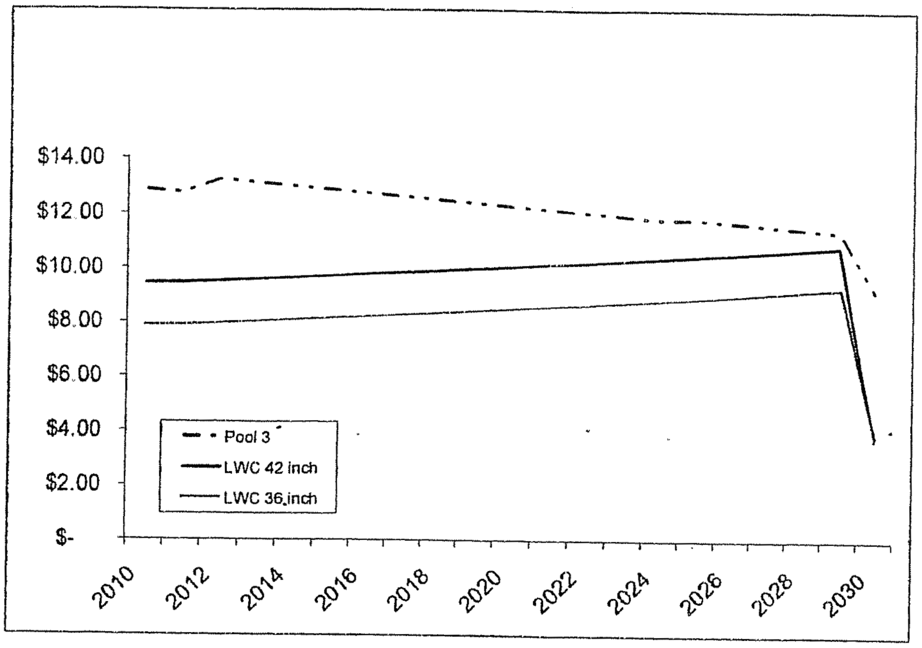
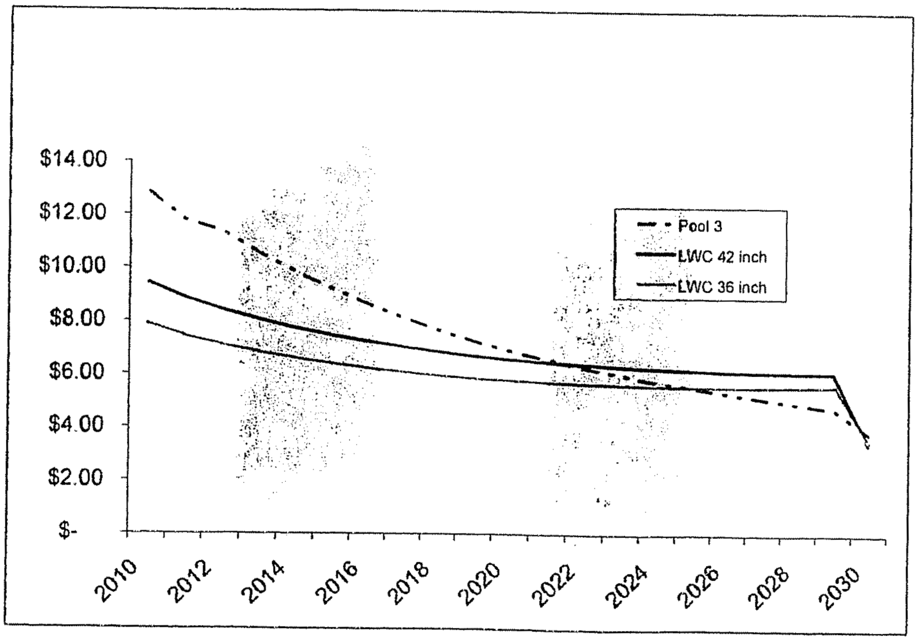


Figure 5-3
Unit Cost Comparison (0.5 MGD Increase)



Section 6
SUMMARY AND CONCLUSIONS

RW BECK

Section 6
SUMMARY AND CONCLUSIONS

6.1 Capital Costs

The capital costs for the Pool 3 and LWC pipeline options were compared. R.W. Beck performed no independent cost estimates, but rather extracted the estimated capital costs from previous engineering studies. Our investigation also included a 36-inch pipeline alternative from Louisville, as well as a Phase 2 project to expand both options in the case of increasing flows and capacity needs beyond the year 2030. Table 6-1 presents a summary of the capital cost comparison.

Table 6-1
Capital Cost Comparison (2007 $ million)

	Pool 3	LWC-42"	LWC-36"
Phase 1 (2007-2030)			
Construction Estimate	$ 108.3	$ 73.0	$ 64.5
Contingency	21.6	14.6	6.4
Probable Construction Cost	$ 129.9	$ 87.6	$ 70.9
Engineering/permitting/admin	33.3	22.0	14.3
Interest/financing	4.2	3.7	2.9
Total Phase 1 Project Cost	**$ 167.4[1]**	**$ 113.3**	**$ 88.1**
% difference	**---**	**32%**	**47%**
Phase 2 (2030-2050)			
Construction Estimate	$ 111.0	$ 54.1	
Contingency	22.2	10.8	
Probable Construction Cost	$ 133.2	$ 64.9	
Engineering/permitting/admin	33.3	16.2	
Interest/financing	4.8	2.4	
Total Phase 2 Project Cost	**$ 171.3**	**$ 83.5**	
% difference	**---**	**51%**	

1 Not including UV project

The capital costs are significantly lower for both a 42-inch and 36-inch pipeline from Louisville to Lexington than to build a new treatment plant on Pool 3. In the event future capacity needs require a connection from Pool 3 to the Ohio River, the cost to build that project is twice the cost of constructing a parallel LWC pipeline.

6.2 Present Worth Cost Comparison

The capital costs outlined above were translated into annual debt service and/or return on rate base numbers for the two options, added to the annual O&M expenses, and discounted back to 2007 to calculate a life-cycle present worth cost for each. Table 6-2 provides a comparison under both the constant 6 MGD flow and the increasing flow scenarios for phases 1 and 2. The LWC option shown is for the 42-inch pipeline so as to present an "apples-to-apples" comparison with the Pool 3 option.

Table 6-2
Present Worth Cost Comparison (2007 $ million)

	Constant Flow 6 MGD	Increasing Flow 0.5 MGD / yr
Phase 1 (2010-2030)		
Pool 3 Option	$ 316	$ 326
LWC Option	250	298
Difference	$ 66	$ 28
%	21%	9%
Phase 2 (2030-2050)		
Pool 3 Option	$ 79	$ 300
LWC Option	47	211
Difference	$ 32	$ 89
%	41%	30%
Combined (2010-2050)		
Pool 3 Option	$ 395	$ 626
LWC Option	297	509
Difference	$ 98	$ 117
%	25%	19%

The life-cycle, present worth cost comparison indicates that the LWC option has a lower present worth cost under both the constant 6 MGD and increasing flow assumptions. The LWC cost is lower in either the 20-year or 40-year analysis, and the difference is equal to or exceeds $100 million (20-25%) over the 40-year timeframe.

The only scenario that produced similar present worth costs between the LWC and Pool 3 options was the case where the LWC wholesale rate increased by 5% each year as opposed to the 3% per year assumption used in the baseline models. In discussing this with LWC, we believe it is possible that rate increases of that magnitude are possible in the short term, but unlikely over a sustained 20 or 40-year period. The economic conditions assumed in the model include a 2.4% inflation rate and an annual capital construction cost increase of 3%. Given these metrics and the fact that the LWC wholesale rate has increased by an average of 2% over the past 15 years, R.W. Beck is comfortable with the 3% per year wholesale rate increase assumption.

6.3 Conclusions

Delivering water from the Louisville Water Company to Central Kentucky customers through a publicly-owned pipeline from Shelby County is a more cost-effective alternative than constructing the proposed new intake and treatment plant on Pool 3 of the Kentucky River. Although the Pool 3 option becomes more cost-effective with increasing flows and better utilization of the assets, the LWC wholesale rate must increase by 5% per year for more than 20 years in order for the LWC pipeline option to approach the Pool 3 present worth cost.

Increasing flows will eventually deplete the capacity of Pool 3 and require an Ohio River supply. The capital cost to provide an Ohio River expansion of the Pool 3 option is twice the cost of a parallel pipeline to Louisville, and translates into significantly higher present worth costs for the Pool 3 option beyond 2030.

Appendix A
INCREASING FLOW SCENARIO
SAMPLE MODEL OUTPUT

Appendix A-1
POOL 3 OPTION

R·W·BECK

	Basis %	Basis $	2007	2008		2010	2011	2012	2013	2014	2015	2016	2017
Capital Expenditures													
Intake, Pump Station, Treatment Plant (1)	3.10%	$ 53,217,500	$ 54,867,245	$ 27,433,623	$ 27,433,623								
UV Disinfection Costs (2011) (2)	3.10%						6,425,271						
Raw Water Main (3)	3.10%	350,000	360,850	201,045	201,045								
Transmission Lines with Connections (4)	3.10%	48,300,000	48,387,000	24,193,999	24,193,999								
Storage Tanks (5)	3.10%	2,100,000	2,165,100	1,082,550	1,082,550								
Booster Pump Stations (5)	3.10%	2,500,000	2,577,500	1,288,750	1,288,750								
Initial Capital Expenditures		$ 106,917,500	$ 108,311,505	$ 54,155,595	$ 54,155,595		6,425,271						
Treatment Plant Contingency (6)	20%	$ 11,143,500	$ 11,486,949	5,743,474	5,743,474								
Transmission Line Contingency (7)	20%	10,158,000	10,175,405	5,088,715	5,088,715								
Total Contingency		21,301,500	$ 21,662,357	10,831,190	10,831,190								
Opinion of Probable Construction Cost		$ 127,969,000	$ 129,973,912	64,987,160	$ 64,987,160		6,425,271						
Land (8)	7.4%	$ 770,000	$ 788,480	394,240	$ 394,240								
Easements and Permitting (9)	[illegible]%	6,500,450	6,498,[illegible]	3,249,352	3,249,352		221,294						
Engineering, Legal, Administration (9)	20%	25,591,200	25,994,864	12,997,432	12,997,432		1,285,054						
Capital Cost		$ 160,531,250	$ 163,256,379	81,628,185	$ 81,628,185		8,031,592						
Long Term Debt (10)	60%	$ 96,318,750	$ 97,953,827	$ 48,976,914	$ 48,976,914								
Issuance Cost (11)	1.0%	$ 963,188	$ 979,538	$ 489,769	$ 489,769		80,316						
Capitalized Interest (12)	4.50%		3,183,350	1,591,725	1,591,725		261,027						
Total Phase One Capital Expenditure			$ 167,419,41[illegible]	$ 83,709,708	$ 83,709,708		$ 8,372,931						
Phase Two Capital Expenditures													
15 MGD Intake and Pump Station at the Ohio River													
30 Mile 30" Raw water main from Ohio River to Pool 3													
20 MGD Treatment Plant Expansion													
30 mile 30" Transmission main to Lexington													
New booster pump stations and storage													
Land													
Initial Capital Expenditures													
Treatment Plant Contingency (6)													
Transmission Plant Contingency (7)													
Total Contingency													
Opinion of Probable Construction Cost													
Easements and Permitting (9)													
Engineering, Legal, Administration (9)													
Capital Cost													
Issuance Cost (11)													
Capitalized Interest (12)													
Total Phase Two Capital Expenditure													
Grand Total Capital Expenditures - Phase One and Two			$ 167,419,416										
Annual Operating Expenses													
WTP Operations and Maintenance Expenses (13)													
Chemicals	2.4%					$ 168,554	$ 180,584	$ 209,200	$ 220,231	$ 247,104	$ 258,850	$ 291,450	$ 313,075
Labor	2.4%					653,516	666,139	682,117	698,436	715,252	732,416	748,590	767,566
Security	2.4%					850,880	917,264	914,573	322,123	329,893	337,770	345,876	354,177
Maintenance (Plant)	2.4%					314,571	322,129	329,894	337,770	345,870	354,177	362,678	371,382
Treatment Plant Electricity	2.4%					520,415	563,570	643,984	706,545	771,130	809,846	910,373	984,015
Total Annual Operating and Maintenance Expenses						$ 1,509,0[illegible]	$ 2,066,44[illegible]	$ 2,179,[illegible]	$ 2,701,184	$ 2,409,815	$ 2,532,801	$ 2,669,420	$ 2,792,043
Booster Pump and Transmission Line O&M													
Maintenance (Transmission Lines)	2.4%					92,612	94,425	92,971	67,554	69,171	70,803	72,530	74,270
Booster Pump Electricity (14)	2.4%					150,273	153,422	147,135	161,478	174,321	191,836	217,999	224,823
Total Booster Pump and Transmission O&M						$ 183,148	$ 157,846	$ 213,106	$ 228,982	$ 245,495	$ 262,675	$ 280,534	$ 299,091
Total Operating Expenses						$ 2,149,2[illegible]	$ 2,264,264	$ 2,329,534	$ 2,529,139	$ 2,655,317	$ 2,795,535	$ 2,940,954	$ 3,091,740
Total Annual Operating Expenses ($/000 gallon)						$ 4.96	$ 4.76	$ 4.94	$ 4.92	$ 4.91	$ 4.90	$ 4.91	$ 4.89
Other Operating Expenses													
Property Taxes (15)	2.4%					$ 1,212,834	$ 1,241,931	$ 1,271,739	$ 1,302,271	$ 1,333,525	$ 1,365,508	$ 1,398,303	$ 1,431,862
KRA Withdrawal Fee (16)	$0.05					$ 109,[illegible]	$ 118,622	$ 127,750	$ 136,875	$ 146,000	$ 155,125	$ 164,250	$ 173,375
Phase I Project													
KAWC Cost of Capital (80%) (17)(22)						16,836,[illegible]	16,504,603	16,172,57[illegible]	15,841,121	15,509,670	15,177,419	14,845,966	14,513,717
UV Cost of Capital (100%) (17)(24)								1,000,452	1,010,625	932,766	965,056	935,151	912,797
Main Debt Service (20%) (22)						4,595,629	4,595,629	4,595,629	4,595,629	4,556,629	4,595,605	4,595,629	4,595,629
Phase 2 Project													
KAWC Cost of Capital (80%) (17)(23)													
Main Debt Service (20%) (23)													
Total Other Operating Expenses						22,754,6[illegible]	$ 22,461,021	$ 23,214,[illegible]	$ 22,895,517	$ 22,577,713	$ 22,295,066	$ 21,947,874	$ 21,626,675
Renewal and Replacement Fund													
R&R (TP) (18)	2.5%					$ 2,2[illegible]	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928
R&R (UV) (18)	2.5%							$ 209,323	209,373	209,373	209,323	209,323	209,323
R&R (TL) (19)	1.3%					982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129
Total Renewal and Replacement Fund Costs (Depreciation)						3,236,057	$ 3,236,057	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381
Total Expenses						$ 28,1[illegible]	$ 27,961,3[illegible]	$ 29,049,7[illegible]	$ 28,261,034	$ 28,677,913	$ 28,580,575	$ 28,329,248	$ 28,103,505
Total Expenses ($/000gallon)						$ 12.85	$ 11.[illegible]	$ 11.3[illegible]	$ 10.64	$ 9.82	$ 9.15	$ 8.62	$ 8.12
Discounted Value						[illegible]	$ 22,740,3[illegible]	[illegible]	$ 21,412,[illegible]	$ 20,321,1[illegible]	$ 19,266,877	$ 18,312,216	$ 17,366,161
Total Discounted Cost (21)		$ 320,431,457											
Discount Rate		4.7%											

Notes:

1 Price adjusted to actual cost of 25 MGD Plant - Gannett Fleming Report
2 UV Facility with Contingency included - adjusted to actual cost of 25 MGD plant - GF Report Page 26
3 1,300 foot pipe at $260 per foot
4 Transmission Line - 54 mi with Additional Burners - $300k - Gannett Fleming Report Page 26
5 Gannett Fleming Report Page 25
6 20% of Treatment Plant Expenditures
7 20% of Transmission Line Expenditures
8 Sauciand Testimony
9 Based on percentage of Probable Construction Cost
10 Amount of Capital cost to be financed
11 Cost of issuing bonds - 1% of Long Term Debt
12 Interest on funds used during construction
13 Table 4 Kentucky American Water annual Operation & Maintenance Costs
14 Increases with rate of inflation and with water usage (MGD) - Table 4 KAW annual O & M Costs thru 2017
15 Linda Bridwell Testimony
16 $.05 Paid per thousand gallons used - O'Brien and Gere Report Page 4
17 Series of payments of principal and interest paid on debt based on 7.75% at 20 years
18 2.5% Depreciation Rate Utilized for Plant and UV - Based on 40 Year Life
19 1.3% Depreciation Rate Utilized for Lines - Based on 75 Year Life
20 2.5 Depreciation Rate Utilized
21 Total of all expenses discounted to 2007 dollars
22 Annualized Phase 1 Project Costs
23 Annualized Phase 2 Project Costs
24 Annualized UV Costs

	Basis %	Basis $	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Capital Expenditures															
Intake, Pump Station, Treatment Plant (1)	3.10%	$ 53,217,598													
UV Disinfection Costs (2011) (2)	3.10%														
Raw Water Main (3)	3.10%	521,686													
Transmission Line to [illegible] (4)	3.10%	46,393,927													
Storage Tanks (5)	3.10%	2,100,000													
Booster Pump Stations (5)	3.10%	2,590,000													
Initial Capital Expenditures		$ 106,517,[illegible]													
Treatment Plant Contingency (6)	20%	$ 11,143,[illegible]													
Transmission Line Contingency (7)	20%	10,153,[illegible]													
Total Contingency		$ 21,311,590													
Opinion of Probable Construction Cost		127,862,[illegible]													
Land (8)	2.45%	$ 750,000													
Easements and Permitting (9)	3.00%	6,350,453													
Engineering, Legal, Administrative (9)	20%	25,571,600													
Capital Cost		160,511,750													
Long Term Debt (10)	[illegible]	$ 20,316,750													
Issuance Cost (11)	1.0%	$ 565,188													
Capitalized Interest (12)	4.50%														
Total Phase One Capital Expenditure															
Phase Two Capital Expenditures															
15 MGD Intake and Pump Station at the Ohio River															
30 Mile 30" Raw water main from Ohio River to Pool 5															
20 MGD Treatment Plant Expansion															
30 mile 30" Transmission main to Customer															
New Booster Pump Station and Storage															
Land															
Initial Capital Expenditures															
Treatment Plant Contingency (6)															
Transmission Plant Contingency (7)															
Total Contingency															
Opinion of Probable Construction Cost															
Easements and Permitting (8)															
Engineering, Legal, Administrative (9)															
Capital Cost															
Issuance Cost (11)															
Capitalized Interest (12)															
Total Phase Two Capital Expenditure															
Grand Total Capital Expenditures - Phase One and Two															
Annual Operating Expenses															
WTP Operations and Maintenance Expenses (13)			$ 339,410	365,157	351,727	419,361	444,090	477,909	506,414	541,202	574,602	609,010	649,771	683,319	722,257
Chemicals	2.45%		786,428	395,932	624,629	844,425	944,086	885,430	600,689	1,097,945	1,124,295	1,151,275	1,178,509	1,207,283	1,239,176
Labor	2.45%		357,678	371,352	360,295	359,422	398,766	406,309	418,139	428,171	438,497	440,973	455,745	470,783	482,021
Security	2.45%		350,295	355,427	396,768	408,446	416,132	428,174	434,450	444,973	457,749	470,703	462,061	493,651	505,450
Maintenance (Plant)	2.45%		1,090,002	1,140,424	1,225,403	1,309,767	1,330,450	1,492,745	1,539,714	1,690,482	1,756,169	1,933,942	2,016,625	2,134,096	2,255,778
Treatment Plant Electricity	2.45%														
Total Annual Operating and Maintenance Expenses			$ 2,929,680	3,171,967	3,215,222	3,371,251	3,505,142	3,692,670	3,667,015	4,200,850	4,352,463	4,584,555	4,762,337	4,989,021	5,201,622
Booster Pump and Transmission Line O&M			44,059	77,684	79,754	81,898	84,628	86,695	87,090	69,795	91,550	94,157	96,416	98,739	101,100
Maintenance (Transmission Line)	2.45%		242,336	290,580	379,516	299,231	315,741	341,056	363,313	380,215	410,153	434,996	460,750	487,564	515,392
Booster Pump Electricity (14)	2.45%		$ 318,395	318,444	456,272	380,905	413,565	420,652	451,403	470,029	502,102	529,153	557,216	586,314	616,491
Total Booster Pump and Transmission O&M															
Total Operating Expenses			$ 3,244,075	3,410,131	3,572,494	3,752,156	3,902,511	4,119,323	4,312,316	4,682,286	4,894,565	5,113,708	5,349,556	5,575,335	5,818,113
Total Annual Operating Expenses ($/000 gallon)			0.89	0.86	0.89	0.92	[illegible]	0.96	0.91	0.95	0.96	0.97	0.98	0.99	1.00
Other Operating Expenses															
Property Taxes (15)	2.45%	$	$ 1,400,227	1,201,416	1,557,491	1,574,349	1,617,130	1,650,825	1,696,444	1,731,015	1,772,552	1,816,101	1,856,903	1,903,271	1,946,959
KRA Withdrawal Fee (16)	[illegible]		$ 182,591	191,026	201,756	209,875	219,000	228,175	237,250	240,375	255,581	264,025	273,754	282,675	292,000
Phase I Project															
KAWC Cost of Capital (20%) (17)			14,161,916	13,852,414	13,512,165	13,186,412	12,854,461	12,522,609	12,154,754	11,590,022	11,027,771	11,295,920	10,964,069	10,632,217	10,300,301
UV Cost of Capital (100%) (18)			225,490	458,027	531,755	864,943	776,131	751,299	724,407	667,635	674,583	643,971	617,136	590,300	563,474
More Debt Service (80%) (19)			4,556,629	4,556,629	4,556,629	4,556,629	4,556,629	4,556,629	4,556,629	4,556,629	4,556,629	4,556,629	4,556,629	4,556,629	
Phase 2 Project															
KAWC Cost of Capital (20%) (20)															
More Debt Service (80%) (21)															
Total Other Operating Expenses			21,311,081	20,957,312	20,662,766	20,371,126	20,055,454	19,748,487	19,438,549	19,230,270	18,922,263	18,615,240	18,309,251	18,004,759	[illegible]
Renewal and Replacement Fund															
R&R (TP) (22)	2.5%	$	2,253,926	2,253,926	2,253,926	2,253,926	2,253,926	2,253,926	2,253,926	2,253,926	2,253,926	2,253,926	2,253,926	2,253,926	2,253,926
R&R (UV) (23)	2.5%		$ 209,323	209,323	209,323	209,323	209,323	209,323	209,323	209,323	209,323	209,323	209,323	209,323	209,323
R&R (TL) (24)	1.3%		982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129
Total Renewal and Replacement Fund Costs (Depreciation)			$ 3,445,381	3,445,381	3,445,381	3,445,381	3,445,381	3,445,381	3,445,381	3,445,381	3,445,381	3,445,381	3,445,381	3,445,381	3,445,381
Total Expenses			28,002,137	27,822,824	27,712,283	[illegible]	27,412,247	27,313,231	27,196,[illegible]	27,354,543	27,262,[illegible]	27,174,334	27,105,180	27,025,015	22,356,454
Total Expenses ($/000gallon)			7.67	7.22	[illegible]	[illegible]	[illegible]	5.90	[illegible]	[illegible]	5.34	[illegible]	[illegible]	4.78	3.63
Discounted Value			16,513,546	15,596,242	[illegible]	[illegible]	[illegible]	12,801,[illegible]	12,174,514	11,097,[illegible]	11,142,[illegible]	10,290,684	[illegible]	[illegible]	7,091,[illegible]
Total Discounted Cost (25)		$ [illegible] 457													
Discount Rate		4.7%													

Notes:
Price adjusted to reflect cost of 25 MGD Plant - Gannett Fleming Report
UV Facility with Contingency included - Adjusted to reflect cost of 25 MGD plant - GF Report Page 2[illegible]
1,500 foot pipe @ $300 per foot
Transmission Line - $48m with Additional Booster - $990k - Gannett Fleming Report Page 2[illegible]
Gannett Fleming Report Page 25
20% of Treatment Plant Expenditures
20% of Transmission Line Expenditures
Standard Testimony
Based on percentage of Probable Construction Cost
Amount of Capital cost to be financed
Cost of issuing bonds - 1% of Long Term Debt
Interest on funds used during construction
Table 4 Kentucky American Water Annual Operation & Maintenance Costs
Increases with rate of inflation and with water usage (MGD) - Table 4 KAW Annual O & M Costs Nov [illegible]
Linda Bridwell Testimony
$.05 Paid per thousand gallons used - O'Brien and Gere Report Page 4
Series of payments of principal and interest paid on debt based on 4.75% at 20 years
2.5% Depreciation Rate Utilized for Plant and UV - Based on 40 Year Life
1.3% Depreciation Rate Utilized for Lines - Based on 75 Year Life
2.5 Depreciation Rate Utilized
Total of all expenses discounted to 2007 dollars
Annualized Phase 1 Project Costs
Annualized Phase 2 Project Costs
Annualized UV Costs

Appendix A-2
LWC OPTION

Water Supply Opti[illegible]
Louisville Water [illegible]
Louisville Water Compa[illegible] Option

	Basis %	Basis $	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Phase One Capital Expenditure												
Pipeline (1)	3.1%	$ 66,528,000	$ 66,528,000	$ 33,264,000	$ 33,264,000	$	$	$	$	$	$	$
Ky. River Crossing	3.1%	$ 1,700,000	$ 1,700,000	850,000	850,000							
Booster Pump Station & Storage (2)	3.1%	4,600,000	4,742,000	2,371,300	2,371,300							
Initial Capital Expenditures		$ 72,828,000	$ 72,970,600	$ 36,485,300	$ 36,485,300	$	$	$	$	$	$	$
Contingency (3)	20%	14,565,600	14,594,120	7,297,060	7,297,060							
Opinion of Probable Construction Cost		87,393,000	87,564,720	43,782,360	43,782,360							
Easements and Permitting (4)	5%	$ 4,369,680	$ 4,378,230	$ 2,189,118	$ 2,189,118	$	$	$	$	$	$	$
Engineering, Legal, Administrative (4)	20%	17,478,720	17,512,944	8,756,472	8,756,472							
Land (4 Acres for Booster Pump Station) (5)	2.40%	85,000	87,040	43,520	43,520							
Capital Cost		$ 109,327,000	$ 109,542,940	$ 54,771,470	$ 54,771,470	$	$	$	$	$	$	$
Issuance Cost (7)	1%	$ 1,093,270	$ 1,095,429	$ 547,715	$ 547,715	$	$	$	$	$	$	$
Capitalized Interest (6)	4.7%	2,560,185	2,574,259	1,028,885	1,028,885							
Total Phase One Capital Expenditure		$ 112,980,455	$ 113,212,628	$ 56,348,070	$ 56,348,070	$	$	$	$	$	$	$
Less Grant			$									
Total Net Capital Cost			$ 113,212,628									
Phase Two Capital Expenditures												
44 Mile 30" Parallel Transmission Line	0.00%	$	$	$	$	$	$	$	$	$	$	$
Kentucky River Crossing												
New booster Pump Station and storage	0.00%											
Initial Capital Expenditures		$	$	$	$	$	$	$	$	$	$	$
Contingency (3)	0%	$	$	$	$	$	$	$	$	$	$	$
Opinion of Probable Construction Cost		$	$	$	$	$	$	$	$	$	$	$
Easements and Permitting (4)	0%	$	$	$	$	$	$	$	$	$	$	$
Engineering, Legal, Administrative (4)	0%											
Capitalized Interest (6)	0%											
Capital Cost		$	$	$	$	$	$	$	$	$	$	$
Issuance Cost (7)	0%											
Total Phase Two Capital Expenditures		$	$	$	$	$	$	$	$	$	$	$
Grand Total Capital Expenditures - Phase One and Two		$	$ 113,212,628	$	$	$	$	$	$	$	$	$
Operations and Maintenance Expenses												
Electricity (8)		$	$	$	$	$ 172,266	$ 191,100	$ 210,739	$ 231,211	$ 252,544	$ 274,768	$ 297,913
Maintenance (12)	2.40%					94,489	96,755	99,078	101,456	103,891	106,385	108,938
Wholesale Water Cost (9)						3,744,900	4,178,684	4,635,125	5,115,192	5,619,891	6,150,208	6,707,410
Meter Charge			$ 16,950			18,200	18,746	19,308	19,888	20,484	21,099	21,732
Total Annual Operating Expenses ($/000 gallon)		$	$	$	$	$ 4,029,854	$ 4,485,287	$ 4,964,251	$ 5,467,747	$ 5,996,810	$ 6,552,519	$ 7,135,903
Total Annual Operating Expenses ($)		$	$	$	$	$ 1.84	$ 1.89	$ 1.04	$ 2.00	$ 2.05	$ 2.11	$ 2.17
Other Operating Expenses												
Debt Service - Phase One (10)		$	$	$	$	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320
Debt Service - Phase Two (10)												
KRA Withdrawal Fee	$0.05					109,500	118,625	127,750	136,875	146,000	155,125	164,250
Total Other Operating Expenses		$	$		$	$ 15,647,820	$ 15,656,945	$ 15,666,070	$ 15,675,195	$ 15,684,320	$ 15,693,445	$ 15,702,570
Renewal and Replacement Fund (Transmission) (11)	1.33%					950,275	887,040	887,040	887,040	887,040	887,040	887,040
Renewal and Replacement Fund (Treatment Plant) (12)	2.5%											
Total R & R Fund						950,275	887,040	887,040	887,040	887,040	887,040	887,040
Total Annual Expenses ($)		$	$	$	$	$ 20,627,948	$ 21,029,271	$ 21,517,361	$ 22,029,981	$ 22,568,170	$ 23,133,004	$ 23,725,602
Total Annual Expenses ($/000 gallon)		$	$	$	$	$ 9.42	$ 8.86	$ 8.42	$ 8.05	$ 7.73	$ 7.46	$ 7.22
Discounted Value		$	$	$	$	$ 17,504,777	$ 17,102,679	$ 16,714,071	$ 16,344,088	$ 15,991,759	$ 15,656,159	$ 15,336,412

Total Discounted Cost (13)	$ 297,887,580
Discount Rate	4.7%

Notes:
1 42 mile pipe @ $300/foot KAW Request for Documents - Bridwell/Svindland
2 Storage Tank - $2.1m Booster Pump Station - $2.6m both inflated to 2007 $'s Gannett Fleming Report
3 20% of Initial Capital Expenditures
4 As a percentage of Opinion of Probable Construction Cost
5 4 Acres Testimony - Svindland
6 Interest on funds used during construction @ 4.7% assuming 2 year buildout
7 Cost of issuing bonds - 1% of Capital Cost
8 Electricity increases with rate of inflation and water usage - Table 4 Annual O & M Costs New WTP KAW
9 Rate - Begins at $1.71 increasing at determined rate between 0% and 5% - Presentation to BWSC
10 Series of payments of principal and interest paid on debt based on 4.7% at 20 years
11 Based on 1.33% of life with assumed life of 75 years
12 Based on 2.5% of life with assumed life of 40 years
13 Total of all expenses discounted to 2007 dollars
14 KAW Annual O & M Expenses

Water Supply Optic
Louisville Water (
Louisville Water Com, on

	Basis %	Basis $	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Phase One Capital Expenditure																
Pipeline (1)	3.1%	$ 66,528,000														
Ky River Crossing	3.1%	$ 1,700,000														
Booster Pump Station & Storage (2)	3.1%	4,600,000														
Initial Capital Expenditures		$ 72,828,000														
Contingency (3)	20%	14,565,600														
Opinion of Probable Construction Cost		87,303,600														
Easements and Permitting (4)	5%	$ 4,369,680														
Engineering, Legal, Administrative (4)	20%	17,478,720														
Land (4 Acres for Booster Pump Station) (5)	2.40%	85,000														
Capital Cost		$ 109,327,000														
Issuance Cost (7)	1%	$ 1,093,270														
Capitalized Interest (6)	4.7%	2,509,185														
Total Phase One Capital Expenditure		$ 112,980,455														
Less Grant																
Total Net Capital Cost																
Phase Two Capital Expenditures																
44 Mile 30" Parallel Transmission Line	0.00%	$														
Kentucky River Crossing	0.00%															
New booster Pump Station and storage		$														
Initial Capital Expenditures																
Contingency (3)	0%	$														
Opinion of Probable Construction Cost		$														
Easements and Permitting (4)	0%	$														
Engineering, Legal, Administrative (4)	0%															
Capitalized Interest (6)	0%	$														
Capital Cost																
Issuance Cost (7)	0%	$														
Total Phase Two Capital Expenditures		$														
Grand Total Capital Expenditures - Phase One and Two		$														
Operations and Maintenance Expenses		$														
Electricity (8)	2.40%		$ 322,011	$ 347,094	$ 373,196	$ 400,350	$ 428,593	$ 457,981	$ 488,492	$ 520,224	$ 553,198	$ 587,456	$ 623,039	$ 659,991	$ 698,359	$ 738,188
Maintenance (14)			111,552	114,230	116,971	119,779	122,653	125,597	128,611	131,698	134,859	138,095	141,409	144,803	148,279	151,837
Wholesale Water Cost (9)			7,292,445	7,906,545	8,550,929	9,226,859	9,935,650	10,678,664	11,457,316	12,273,077	13,127,472	14,022,085	14,958,560	15,938,604	16,963,987	18,036,549
Meter Charge			22,384	23,055	23,747	24,459	25,193	25,949	26,727	27,529	28,355	29,206	30,082	30,984	31,914	32,871
Total Annual Operating Expenses ($/000 gallon)		$	$ 7,748,392	$ 8,390,924	$ 9,084,843	$ 9,771,447	$ 10,512,089	$ 11,288,170	$ 12,101,147	$ 12,952,528	$ 13,843,884	$ 14,776,842	$ 15,753,090	$ 16,774,383	$ 17,842,539	$ 18,959,445
Total Annual Operating Expenses ($)		$	$ 2.23	$ 2.30	$ 2.37	$ 2.43	$ 2.50	$ 2.58	$ 2.65	$ 2.73	$ 2.81	$ 2.80	$ 2.88	$ 3.06	$ 3.15	$ 3.25
Other Operating Expenses		$														
Debt Service - Phase One (10)			$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$ 15,538,320	$
Debt Service - Phase Two (10)			173,375	182,500	191,625	200,750	209,875	219,000	228,125	237,250	246,375	255,500	264,625	273,750	282,875	292,000
KRA Withdrawal Fee	$0.05	$	$ 15,711,695	$ 15,720,820	$ 15,729,945	$ 15,739,070	$ 15,748,195	$ 15,757,320	$ 15,766,445	$ 15,775,570	$ 15,784,695	$ 15,793,820	$ 15,802,945	$ 15,812,070	$ 15,821,195	$ 202,000
Total Other Operating Expenses			887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040
Renewal and Replacement Fund (Transmission) (11)	1.33%		887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040
Renewal and Replacement Fund (Treatment Plant) (12)	2.5%															
Total R & R Fund		$	$ 24,347,127	$ 24,998,784	$ 25,681,827	$ 26,397,557	$ 27,147,324	$ 27,932,530	$ 28,754,631	$ 29,615,138	$ 30,515,619	$ 31,457,701	$ 32,443,075	$ 33,473,492	$ 34,550,773	$ 20,138,485
Total Annual Expenses ($)		$	$ 7.02	$ 6.85	$ 6.70	$ 6.57	$ 6.47	$ 6.38	$ 6.30	$ 6.24	$ 6.19	$ 6.16	$ 6.13	$ 6.11	$ 6.11	$ 3.45
Total Annual Expenses ($/000 gallon)		$	$ 15,031,681	$ 14,741,173	$ 14,404,133	$ 14,199,843	$ 13,947,621	$ 13,706,820	$ 13,476,824	$ 13,257,048	$ 13,040,937	$ 12,845,904	$ 12,653,027	$ 12,409,452	$ 12,202,987	$ 6,843,524
Discounted Value																
...l Discounted Cost (13)		$ 297,687,580														
Discount Rate		4.7%														

...nile pipe @ $300/foot KAW Request for Documents - Bridwell/Swindland
...age Tank - $2.1m Booster Pump Station - $2.6m both inflated to 2007 $'s Gannett Fleming Report
... of Initial Capital Expenditures
... percentage of Opinion of Probable Construction Cost
...res Testimony - Swindland
...est on funds used during construction @ 4.7% assuming 2 year buildout
... of issuing bonds - 1% of Capital Cost
...tricity increases with rate of inflation and water usage - Table 4 Annual O & M Costs New WTP KAW
... - Begins at $1.71 increasing at determined rate between 0% and 5% - Presentation to BWSC
...es of payments of principal and interest paid on debt based on 4.7% at 20 years
...ed on 1.33% of life with assumed life of 75 years
...ed on 2.5% of life with assumed life of 40 years
...l of all expenses discounted to 2007 dollars
...v Annual O & M Expenses

Appendix B
CONSTANT 6 MGD FLOW SCENARIO
SAMPLE MODEL OUTPUT

R·W·BECK

Appendix B-1
POOL 3 OPTION

Water Company
Pool Three Option

	Basis %	Basis $	2007	2008		2010	2011	2012	2013	2014	2015	2016	2017
Capital Expenditures													
Intake, Pump Station, Treatment Plant (1)	3.10%	$ 51,217,549	$ 54,667,243	$ 27,433,621	$ 27,433,621	$	$	$	$	$	$	$	$
UV Disinfection Costs (2011) (2)	3.10%						6,425,271						
Raw Water Main (3)	3.10%	190,000	402,050	201,045	201,045								
Transmission Line to Pool 3 booster (4)	3.10%	48,300,000	48,300,000	24,150,000	24,150,000								
Storage Tank (5)	3.10%	2,100,000	2,165,100	1,082,550	1,082,550								
Booster Pump Station (5)	3.10%	2,500,000	2,577,500	1,288,750	1,288,750								
Initial Capital Expenditures		$ 104,307,549	$ 108,311,933	$ 54,155,966	$ 54,155,966	$	$ 6,425,271	$	$	$	$	$	$
Treatment Plant Contingency (6)	20%	$ 11,143,510	$ 11,488,048	$ 5,744,474	$ 5,744,474	$	$	$	$	$	$	$	$
Transmission Line Contingency (7)	20%	10,158,000	10,173,436	5,086,718	5,086,718								
Total Contingency		$ 21,301,510	$ 21,662,337	$ 10,831,193	$ 10,831,193								
Opinion of Probable Construction Cost		$ 127,809,059	$ 129,974,319	$ 64,987,160	$ 64,987,160	$	$ 6,425,271	$	$	$	$	$	$
Land (8)	7.4%	$ 770,000	$ 786,484	$ 394,242	$ 394,242	$	$ 321,264	$	$	$	$	$	$
Easements and Permitting (9)	5.0%	6,350,453	6,498,716	3,249,358	3,249,358		1,285,054						
Engineering, Legal, Administrative (9)	20%	25,561,809	25,994,864	12,997,432	12,997,432								
Capital Cost		$ 160,531,350	$ 163,254,379	$ 81,628,189	$ 81,628,189	$	$ 8,031,589	$	$	$	$	$	$
Long Term Debt (10)	60%	$ 96,318,750	$ 97,952,627	$ 48,976,314	$ 48,976,314								
Issuance Cost (11)	1.0%	$ 963,188	$ 979,526	$ 489,763	$ 489,763	$	$ 80,316	$	$	$	$	$	$
Capitalized Interest (12)	4.50%		3,183,456	1,591,728	1,591,728		261,027						
Total Phase One Capital Expenditure			$ 167,419,418	$ 83,709,708	$ 83,709,708	$	$ 8,372,931	$	$	$	$	$	$
Phase Two Capital Expenditures		$	$			$	$	$	$	$	$	$	$
15 MGD Intake and Pump Station at the Ohio River													
30 Mile 30" Raw water main from Ohio River to Pool 3		$											
20 MGD Treatment Plant Expansion													
30 mile 30" Transmission main to Lexington		$											
New booster pump station and storage													
Land													
Initial Capital Expenditures			$			$	$	$	$	$	$	$	$
Treatment Plant Contingency (6)		$	$			$	$	$	$	$	$	$	$
Transmission Plant Contingency (7)													
Total Contingency		$	$										
Opinion of Probable Construction Cost		$	$			$	$	$	$	$	$	$	$
Easements and Permitting (8)			$			$	$	$	$	$	$	$	$
Engineering, Legal, Administrative (9)			$			$	$	$	$	$	$	$	$
Capital Cost		$											
Long Term Debt	60%	$											
Issuance Cost (11)		$	$			$	$	$	$	$	$	$	$
Capitalized Interest (12)													
Total Phase Two Capital Expenditure		$	$			$	$	$	$	$	$	$	$
Grand Total Capital Expenditures - Phase One and Two		$	$ 167,419,418	$	$	$	$	$	$	$	$	$	$

	%		2007	2008		2010	2011	2012	2013	2014	2015	2016	2017
Annual Operating Expenses													
WTP Operations and Maintenance Expenses (13)(14)			$	$									
Chemicals	2.4%					$ 168,555	$ 172,600	$ 176,745	$ 180,985	$ 185,328	$ 189,776	$ 194,331	$ 198,995
Labor	2.4%					654,516	669,130	682,117	698,488	715,252	732,418	749,996	767,999
Security	2.4%					300,000	307,200	314,573	322,123	329,853	337,770	345,876	354,177
Maintenance (Plant)	2.4%					314,575	322,125	329,853	337,770	345,876	354,177	362,678	371,382
Treatment Plant Electricity	2.4%					529,415	539,049	551,987	565,234	578,800	592,691	606,916	621,482
Total Annual Operating and Maintenance Expenses		$	$	$	$	$ 1,990,061	$ 2,037,102	$ 2,058,273	$ 2,104,505	$ 2,155,110	$ 2,206,832	$ 2,259,756	$ 2,314,032
Booster Pump and Transmission Line O&M													
Maintenance (Transmission Line)	2.4%					62,915	64,425	65,971	67,554	69,176	70,836	72,536	74,276
Booster Pump Electricity (15)	2.4%					120,273	123,160	126,116	129,143	132,242	135,416	138,666	141,994
Total Booster Pump and Transmission O&M		$	$			$ 183,188	$ 187,584	$ 192,088	$ 196,697	$ 201,417	$ 206,251	$ 211,201	$ 216,270
Total Operating Expenses			$	$	$	$ 2,143,249	$ 2,194,687	$ 2,247,355	$ 2,301,296	$ 2,356,527	$ 2,413,084	$ 2,470,998	$ 2,530,302
Total Annual Operating Expenses ($/000 gallon)		$	$	$	$	$ 0.98	$ 1.00	$ 1.03	$ 1.05	$ 1.08	$ 1.10	$ 1.13	$ 1.16
Other Operating Expenses													
Property Taxes (16)	7.4%					$ 1,217,644	$ 1,241,942	$ 1,271,749	$ 1,302,271	$ 1,333,526	$ 1,365,530	$ 1,398,303	$ 1,431,862
KRA Withdrawal Fee (16)	50.05					$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500
Phase 1 Project													
KAWC Cost of Capital (80%) (17)(18)						16,836,675	16,504,824	16,172,973	15,841,121	15,509,270	15,177,419	14,845,568	14,513,717
UV Cost of Capital (100%) (24)								1,046,482	1,019,020	992,788	965,956	939,124	912,292
Muni Debt Service (20%) (22)						4,595,629	4,595,629	4,595,629	4,595,629	4,595,629	4,595,629	4,595,629	4,595,629
Phase 2 Project													
KAWC Cost of Capital (80%) (23)													
Muni Debt Service (20%) (23)													
Total Other Operating Expenses			$	$	$	$ 22,754,639	$ 22,451,094	$ 23,159,303	$ 22,868,142	$ 22,540,713	$ 22,214,034	$ 21,886,124	$ 21,560,091
Renewal and Replacement Fund													
R&R (TP) (18)	2.5%	$	$	$	$	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928
R&R (UV) (18)	2.5%							$ 209,323	$ 209,323	$ 209,323	$ 209,323	$ 209,323	$ 209,323
R&R (TL) (19)	1.3%					982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129
Total Renewal and Replacement Fund Costs (Depreciation)						$ 3,236,057	$ 3,236,057	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381
Total Expenses		$	$	$	$	$ 28,133,945	$ 27,882,040	$ 28,851,040	$ 28,614,818	$ 28,342,621	$ 28,072,499	$ 27,804,502	$ 27,538,682
Total Expenses ($/000gallon)			$	$	$	$ 12.85	$ 12.70	$ 13.19	$ 13.07	$ 12.94	$ 12.82	$ 12.70	$ 12.57
Discounted Value		$	$	$	$	$ 23,956,182	$ 22,676,395	$ 22,440,164	$ 21,229,392	$ 20,083,523	$ 18,999,155	$ 17,973,044	$ 17,002,117

Total Discounted Cost (21)	$	316,517,895
Discount Rate		4.7%

Notes:
1 Price Adjusted to reflect cost of 25 MGD Plant - Gannett Fleming Report
2 UV Facility with Contingency included - Adjusted to reflect cost of 25 MGD plant - GF Report Page 29
3 1,300 foot drive at $300 per foot
4 Transmission Line - $48m with Additional Booster - $300k - Gannett Fleming Report Page 28
5 Gannett Fleming Report Page 28
6 20% of Treatment Plant Expenditures
7 20% of Transmission Line Expenditures
8 Svindland Testimony
9 Based on percentage of Probable Construction Cost
10 Amount of Capital cost to be financed
11 Cost of issuing bonds - 1% of Long Term Debt
12 Interest on funds used during construction
13 Table 4 Kentucky American Water Annual Operation & Maintenance Costs
14 Increases with rate of inflation and with water usage (MGD) - Table 4 KAW Annual O & M Costs New WTP
15 Linda Bridwell Testimony
16 $.05 Paid per thousand gallons used - O'Brien and Gere Report Page 4
17 Series of payments of principal and interest paid on debt based on 7.75% at 20 years
18 2.5% Depreciation Rate Utilized for Plant and UV - Based on 40 Year Life
19 1.3% Depreciation Rate Utilized for Lines - Based on 75 Year Life
20 2.5 Depreciation Rate Utilized
21 Total of all expenses discounted to 2007 dollars
22 Annualized Phase 1 Project Costs
23 Annualized Phase 2 Project Costs
24 Annualized UV Costs

Water Cost
Plus Three Option

	Basis %	Basis $
Capital Expenditures		
Intake, Pump Station, Treatment Plant (1)	3.10%	$ 53,217,500
UV Disinfection Costs (2011) (2)	3.10%	
Raw Water Main (3)	3.10%	390,000
Transmission Line (w/ addl boosters) (4)	3.10%	46,300,000
Storage Tank (5)	3.10%	2,100,000
Booster Pump Station (5)	3.10%	2,500,000
Initial Capital Expenditures		$ 106,507,500
Treatment Plant Contingency (6)	20%	$ 11,143,500
Transmission Line Contingency (7)	20%	10,158,000
Total Contingency		$ 21,301,500
Opinion of Probable Construction Cost		$ 127,809,000
Land (8)	2.4%	$ 770,000
Easements and Permitting (9)	5.0%	6,390,450
Engineering, Legal, Administrative (9)	20%	25,561,800
Capital Cost		$ 160,531,250
Long Term Debt (10)	60%	$ 96,318,750
Issuance Cost (11)	1.0%	$ 963,138
Capitalized Interest (12)	4.91%	
Total Phase One Capital Expenditure		
Phase Two Capital Expenditures		
15 MGD Intake and Pump Station at the Ohio River		$
31 Mile 30" Raw water main from Ohio River to Pool 3		$
20 MGD Treatment Plant Expansion		$
30 mile 30" Transmission main to Lexington		
New booster pump station and storage		
Land		
Initial Capital Expenditures		
Treatment Plant Contingency (6)		
Transmission Plant Contingency (7)		
Total Contingency		
Opinion of Probable Construction Cost		$
Easements and Permitting (9)		
Engineering, Legal, Administrative (9)		
Capital Cost		$
Long Term Debt		60%
Issuance Cost (11)		$
Capitalized Interest (12)		
Total Phase Two Capital Expenditure		$
Grand Total Capital Expenditures - Phase One and Two		$

	Basis %	2018	2019	2020		2022	2023	2024	2025	2026	2027	2028	2029	2030
Annual Operating Expenses														
WTP Operations and Maintenance Expenses (13)														
Chemicals	2.4%	$ 203,771	$ 208,661	$ 213,665	$ 218,797	$ 224,048	$ 229,425	$ 234,932	$ 240,571	$ 246,344	$ 252,256	$ 258,310	$ 264,509	$ 270,856
Labor	2.4%	780,424	805,302	824,625	844,420	864,666	885,439	906,665	1,097,945	1,124,295	1,151,279	1,178,609	1,207,203	1,236,176
Security	2.4%	302,678	371,382	380,255	359,422	398,766	408,335	418,139	428,174	438,450	448,973	459,749	470,783	482,081
Maintenance (Plant)	2.4%	330,295	359,422	356,718	408,339	418,139	428,174	438,457	448,673	459,749	470,703	482,081	493,651	505,459
Treatment Plant Electricity	2.4%	436,397	451,671	467,311	683,026	699,720	716,516	733,716	751,325	769,357	787,822	806,729	826,091	845,917
Total Annual Operating and Maintenance Expenses	$	$ 2,369,568	$ 2,426,436	$ 2,484,672	$ 2,544,305	$ 2,605,306	$ 2,667,697	$ 2,731,926	$ 2,966,987	$ 3,038,195	$ 3,111,112	$ 3,185,778	$ 3,262,237	$ 3,340,531
Booster Pump and Transmission Line O&M														
Maintenance (Transmission Line)	2.4%	76,059	77,884	79,754	81,668	83,628	85,635	87,690	89,795	91,950	94,157	96,416	98,730	101,100
Booster Pump Electricity (14)	2.4%	145,402	148,891	152,465	156,124	159,871	163,708	167,637	171,660	175,780	179,998	184,318	188,742	193,272
Total Booster Pump and Transmission O&M	$	$ 221,461	$ 226,776	$ 232,218	$ 237,792	$ 243,499	$ 249,343	$ 255,327	$ 261,455	$ 267,729	$ 274,155	$ 280,735	$ 287,472	$ 294,372
Total Operating Expenses		$ 2,591,029	$ 2,653,214	$ 2,716,891	$ 2,782,096	$ 2,848,806	$ 2,917,239	$ 2,987,253	$ 3,228,442	$ 3,305,925	$ 3,385,267	$ 3,466,513	$ 3,549,710	$ 3,634,903
Total Annual Operating Expenses ($/000 gallon)	$	$ 1.18	$ 1.21	$ 1.24	$ 1.27	$ 1.30	$ 1.33	$ 1.36	$ 1.47	$ 1.51	$ 1.55	$ 1.58	$ 1.62	$ 1.66
Other Operating Expenses														
Property Taxes (15)	2.4% $	$ 1,466,227	$ 1,501,418	$ 1,537,450	$ 1,574,349	$ 1,612,135	$ 1,650,825	$ 1,690,444	$ 1,731,015	$ 1,772,559	$ 1,815,101	$ 1,858,663	$ 1,903,271	$ 1,948,950
KRA Withdrawal Fee (16)	50.05	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500	$ 109,500
Phase 1 Project														
KAWC Cost of Capital (80%) (22)		14,181,605	13,850,014	13,518,163	13,186,312	12,854,461	12,522,609	12,190,756	11,859,022	11,627,771	11,295,920	10,964,069	10,632,217	10,300,366
UV Cost of Capital (100%) (24)		855,459	858,627	831,795	804,963	778,131	751,299	724,467	697,635	670,803	643,971	617,138	590,306	563,474
Muni Debt Service (20%) (17)		4,595,629	4,595,629	4,595,629	4,595,629	4,595,629	4,595,629	4,595,629	4,595,629	4,595,629	4,595,629	4,595,629	4,595,629	
Phase 2 Project														
KAWC Cost of Capital (80%) (23)														
Muni Debt Service (20%) (17)														
Total Other Operating Expenses	$	$ 21,238,681	$ 20,915,187	$ 20,592,536	$ 20,270,753	$ 19,949,954	$ 19,629,862	$ 19,310,799	$ 19,093,401	$ 18,776,293	$ 18,460,121	$ 18,145,000	$ 17,830,974	$ 12,922,290
Renewal and Replacement Fund														
R&R (TP) (18)	2.5% $	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928	$ 2,253,928
R&R (UV) (18)	2.5%	$ 209,323	$ 209,323	$ 209,323	$ 209,323	$ 209,323	$ 209,323	$ 209,323	$ 209,323	$ 209,323	$ 209,323	$ 209,323	$ 209,323	$ 209,323
R&R (TL) (19)	1.3%	982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129	982,129
Total Renewal and Replacement Fund Costs (Depreciation)		$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381	$ 3,445,381
Total Expenses	$	$ 27,275,091	$ 27,013,781	$ 26,754,209	$ 26,498,229	$ 26,244,102	$ 25,992,487	$ 25,743,432	$ 25,767,724	$ 25,527,598	$ 25,290,768	$ 25,056,894	$ 24,826,014	$ 20,002,573
Total Expenses ($/000gallon)	$	$ 12.45	$ 12.34	$ 12.22	$ 12.10	$ 11.98	$ 11.87	$ 11.75	$ 11.77	$ 11.66	$ 11.55	$ 11.44	$ 11.34	$ 9.13
Discounted Value	$	$ 16,043,456	$ 15,214,296	$ 14,352,017	$ 13,614,[illegible]	$ 12,873,268	$ 12,187,759	$ 11,523,[illegible]	$ 11,016,763	$ 10,424,354	$ 9,964,045	$ 9,334,124	$ 8,832,966	$ 6,767,336

Total Discounted Cost (21)	$	316,517,595
Discount Rate		4.7%

es:
Price adjusted to reflect cost of 25 MGD Plant - Gannett Fleming Report
UV Facility with Contingency included - Adjusted to reflect cost of 25 MGD plant - GF Report Page 26
1,300 foot pipe at $300 per foot
Transmission Line - $46m with Additional Boosters - $300k - Gannett Fleming Report Page 26
Gannett Fleming Report Page 28
20% of Treatment Plant Expenditures
20% of Transmission Line Expenditures
Sandlund Testimony
Based on percentage of Probable Construction Cost
Amount of Capital cost to be financed
Cost of issuing bonds - 1% of Long Term Debt
Interest on funds used during construction
Table 4 Kentucky American Water Annual Operation & Maintenance Costs
Increases with rate of inflation and with water usage (MGD) - Table 4 KAW Annual O & M Costs New WTP
Linda Bridwell Testimony
$.03 Paid per thousand gallons used - O'Brien and Gere Report Page 4
Series of payments of principal and interest paid on debt based on 7.75% at 20 years
2.5% Depreciation Rate Utilized for Plant and UV - Based on 40 Year Life
1.3% Depreciation Rate Utilized for Lines - Based on 75 Year Life
2.5 Depreciation Rate Utilized
Total of all expenses discounted to 2007 dollars
Annualized Phase 1 Project Costs
Annualized Phase 2 Project Costs
Annualized UV Costs

Appendix B-2
LWC OPTION

Water Supply Op[illegible]
Louisville Water Company
Louisville Water Company Option

	Basis %	Basis $	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Phase One Capital Expenditure	3.1%	$ 66,528,000	$ 66,528,000	$ 33,264,000	$ 33,264,000	$	$	$	$	$	$	$
Pipeline (1)	3.1%	$ 1,700,000	$ 1,752,700	870,350	870,350							
Ky River Crossing	3.1%	4,800,000	4,742,600	2,371,300	2,371,300							
Booster Pump Station & Storage (2)		$ 72,828,000	$ 73,023,300	$ 36,511,650	$ 36,511,650	$	$	$	$	$	$	$
Initial Capital Expenditures												
Contingency (3)	20%	14,565,600	14,604,660	7,302,330	7,302,330							
Opinion of Probable Construction Cost		87,393,600	87,627,960	43,813,980	43,813,980							
Easements and Permitting (4)	5%	$ 4,369,680	$ 4,381,398	$ 2,190,699	$ 2,190,699	$	$	$	$	$	$	$
Engineering, Legal, Administrative (4)	20%	17,478,720	17,525,592	8,762,796	8,762,796							
Land (4 Acres for Booster Pump Station) (5)	2.40%	85,000	87,040	43,520	43,520							
Capital Cost		$ 109,327,000	$ 109,621,990	$ 54,810,995	$ 54,810,995	$	$	$	$	$	$	$
Issuance Cost (7)	1%	$ 1,093,270	$ 1,096,220	$ 548,110	$ 548,110	$	$	$	$	$	$	$
Capitalized Interest (6)	4.7%	2,569,185	2,576,117	1,020,620	1,020,629							
Total Phase One Capital Expenditure		$ 112,989,455	$ 113,294,327	$ 56,388,733	$ 56,388,733	$	$	$	$	$	$	$
Less Grant			$									
Total Net Capital Cost			$ 113,294,327									
Phase Two Capital Expenditures	0.00%	$	$	$	$	$	$	$	$	$	$	$
44 Mile 30" Parallel Transmission Line												
Kentucky River Crossing	0.00%											
New booster Pump Station and storage		$	$	$	$	$	$	$	$	$	$	$
Initial Capital Expenditures												
Contingency (3)	0%	$	$	$	$	$	$	$	$	$	$	$
Opinion of Probable Construction Cost		$	$	$	$	$	$	$	$	$	$	$
Easements and Permitting (4)	0%	$	$	$	$	$	$	$	$	$	$	$
Engineering, Legal, Administrative (4)	0%											
Capitalized Interest (6)	0%	$	$	$	$	$	$	$	$	$	$	$
Capital Cost												
Issuance Cost (7)	0%	$	$	$	$	$	$	$	$	$	$	$
Total Phase Two Capital Expenditures		$	$	$	$	$	$	$	$	$	$	$
Grand Total Capital Expenditures - Phase One and Two		$	$ 113,294,327	$	$	$	$	$	$	$	$	$
Operations and Maintenance Expenses		$	$	$	$	$ 172,266	$ 176,400	$ 180,634	$ 184,969	$ 189,408	$ 193,954	$ 198,609
Electricity (8)						94,489	96,756	99,078	101,456	103,891	106,385	108,938
Maintenance (14)	2.40%					3,744,900	3,857,247	3,972,964	4,092,153	4,214,918	4,341,365	4,471,606
Wholesale Water Cost (9)			$ 16,950			18,200	18,740	19,308	19,888	20,484	21,099	21,732
Meter Charge		$	$	$	$	$ 4,029,854	$ 4,149,140	$ 4,271,985	$ 4,398,466	$ 4,528,702	$ 4,662,803	$ 4,800,885
Total Annual Operating Expenses ($/000 gallon)						$ 1.84	$ 1.89	$ 1.95	$ 2.01	$ 2.07	$ 2.13	$ 2.19
Total Annual Operating Expenses ($)		$	$	$	$							
Other Operating Expenses		$	$	$	$	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533
Debt Service - Phase One (10)												
Debt Service - Phase Two (10)	$0.05					109,500	109,500	109,500	109,500	109,500	109,500	109,500
KRA Withdrawal Fee		$	$		$	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033
Total Other Operating Expenses						950,275	887,040	887,040	887,040	887,040	887,040	887,040
Renewal and Replacement Fund (Transmission) (11)	1.33%											
Renewal and Replacement Fund (Treatment Plant) (12)	2.5%					950,275	887,040	887,040	887,040	887,040	887,040	887,040
Total R & R Fund		$	$	$	$	$ 20,639,161	$ 20,695,222	$ 20,818,057	$ 20,944,530	$ 21,074,774	$ 21,208,875	$ 21,346,957
Total Annual Expenses ($)		$	$	$	$	$ 9.42	$ 9.45	$ 9.51	$ 9.56	$ 9.62	$ 9.68	$ 9.75
Total Annual Expenses ($/000 gallon)		$	$	$	$	$ 17,574,325	$ 16,831,004	$ 16,170,873	$ 15,538,796	$ 14,033,542	$ 14,353,931	$ 13,798,838
Discounted Value		$	$	$	$							
Total Discounted Cost (13)		$ 250,257,630										
Discount Rate		4.7%										

Notes:
1 42 mile pipe @ $300/foot KAW Request for Documents - Bridwell/Svndland
2 Storage Tank - $2.1m Booster Pump Station - $2.6m both inflated to 2007 $'s Gannett Fleming Report
3 20% of Initial Capital Expenditures
4 As a percentage of Opinion of Probable Construction Cost
5 4 Acres Testimony - Svndland
6 Interest on funds used during construction @ 4.7% assuming 2 year buildout
7 Cost of issuing bonds - 1% of Capital Cost
8 Electricity increases with rate of inflation and water usage - Table 4 Annual O & M Costs New WTP KAW
9 Rate - Begins at $1.71 increasing at determined rate between 0% and 5% - Presentation to BWSC
10 Series of payments of principal and interest paid on debt based on 4.7% at 20 years
11 Based on 1.33% of life with assumed life of 75 years
12 Based on 2.5% of life with assumed life of 40 years
13 Total of all expenses discounted to 2007 dollars
14 KAW Annual O & M Expenses

	Basis %	Basis $	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Phase One Capital Expenditure																
Pipeline (1)	3.1%	$ 66,528,000	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Ky. River Crossing	3.1%	$ 1,700,000														
Booster Pump Station & Storage (2)	3.1%	4,800,000														
Initial Capital Expenditures		$ 72,828,000	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Contingency (3)	20%	14,565,600														
Opinion of Probable Construction Cost		87,393,600														
Easements and Permitting (4)	5%	$ 4,369,680	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Engineering, Legal, Administrative (4)	20%	17,476,720														
Land (4 Acres for Booster Pump Station) (5)	2.40%	85,000														
Capital Cost		$ 109,327,000	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Issuance Cost (7)	1%	$ 1,093,270	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Capitalized Interest (6)	4.7%	2,569,185														
Total Phase One Capital Expenditure		$ 112,989,455	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Less Grant																
Total Net Capital Cost																
Phase Two Capital Expenditures																
44 Mile 30" Parallel Transmission Line	0.00%	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Kentucky River Crossing	0.00%															
New booster Pump Station and storage																
Initial Capital Expenditures		$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Contingency (3)	0%	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Opinion of Probable Construction Cost		$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Easements and Permitting (4)	0%	$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Engineering, Legal, Administrative (4)	0%															
Capitalized Interest (6)	0%															
Capital Cost		$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Issuance Cost (7)	0%															
Total Phase Two Capital Expenditures		$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Grand Total Capital Expenditures - Phase One and Two		$	$	$	$	$	$	$	$	$	$	$	$	$	$	$
Operations and Maintenance Expenses																
Electricity (8)		$	$ 203,376	$ 208,257	$ 213,255	$ 218,373	$ 223,614	$ 228,980	$ 234,476	$ 240,103	$ 245,866	$ 251,767	$ 257,809	$ 263,997	$ 270,332	$ 276,820
Maintenance (14)	2.40%		111,552	114,230	116,971	119,779	122,653	125,597	128,611	131,698	134,859	138,095	141,409	144,803	148,279	151,837
Wholesale Water Cost (9)			4,605,755	4,743,927	4,886,245	5,032,832	5,183,817	5,339,332	5,499,512	5,664,497	5,834,432	6,009,465	6,189,749	6,375,442	6,566,705	6,763,706
Meter Charge			22,384	23,055	23,747	24,459	25,193	25,949	26,727	27,529	28,355	29,206	30,082	30,984	31,914	32,871
Total Annual Operating Expenses ($/000 gallon)		$	$ 4,943,066	$ 5,089,469	$ 5,240,218	$ 5,395,443	$ 5,555,277	$ 5,719,858	$ 5,889,326	$ 6,063,828	$ 6,243,512	$ 6,428,533	$ 6,619,049	$ 6,815,226	$ 7,017,230	$ 7,225,235
Total Annual Operating Expenses ($)		$	$ 2.28	$ 2.32	$ 2.39	$ 2.46	$ 2.54	$ 2.61	$ 2.69	$ 2.77	$ 2.85	$ 2.94	$ 3.02	$ 3.11	$ 3.20	$ 3.30
Other Operating Expenses																
Debt Service - Phase One (10)		$	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$ 15,549,533	$
Debt Service - Phase Two (10)																
KRA Withdrawal Fee	$0.05		109,500	109,500	109,500	109,500	109,500	109,500	109,500	109,500	109,500	109,500	109,500	109,500	109,500	109,500
Total Other Operating Expenses		$	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 15,659,033	$ 109,500
Renewal and Replacement Fund (Transmission) (11)	1.33%		887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040
Renewal and Replacement Fund (Treatment Plant) (12)	2.5%		887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040	887,040
Total R & R Fund																
Total Annual Expenses ($)		$	$ 21,489,139	$ 21,635,541	$ 21,786,290	$ 21,941,515	$ 22,101,350	$ 22,265,931	$ 22,435,399	$ 22,609,900	$ 22,789,584	$ 22,974,605	$ 23,165,122	$ 23,361,298	$ 23,563,302	$ 8,221,775
Total Annual Expenses ($/000 gallon)		$	$ 9.81	$ 9.88	$ 9.95	$ 10.02	$ 10.09	$ 10.17	$ 10.24	$ 10.32	$ 10.41	$ 10.49	$ 10.58	$ 10.67	$ 10.76	$ 3.75
Discounted Value		$	$ 13,267,187	$ 12,757,951	$ 12,270,147	$ 11,802,837	$ 11,355,125	$ 10,926,153	$ 10,515,103	$ 10,121,193	$ 9,743,675	$ 9,381,834	$ 9,034,980	$ 8,702,480	$ 8,383,702	$ 2,703,950
[illegible]l Discounted Cost (13)	$	250,257,639														
Discount Rate		4.7%														

nile pipe (1) $300/foot KAW Request for Documents - Bridwell/Sundland
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of Initial Capital Expenditures
percentage of Opinion of Probable Construction Cost
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