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PUBLIC SERVICE COMMISSION

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August 23, 2006

Via Hand Delivery

Beth O'Donnell
Executive Director
Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40602-0615

Re: Case No. 2005-00546

Dear Ms. O'Donnell:

Enclosed please find for filing the original and eight (8) copies of Kentucky-American Water Company's Response to the Commission Staff's August 3, 2006 First Set of Interrogatories and Requests for Production of Documents.

Very truly yours,

STOLL KEENON OGDEN PLLC

Lindsey Ingram, Jr.

Lindsey W. Ingram, Jr.

/sl
Encs.
cc w/enc.: David E. Spenard, Esq.
David J. Barberie, Esq.
LEX 010311/122954/3454970.1

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 1

Witness: Linda C. Bridwell

1. Identify the person(s) who prepared "Kentucky-American Water Company Storage Capacity Analysis" and provide his or her curriculum vitae.

RESPONSE:

The original document was written in 2000 by David M. Reves, with input from Gary A. Naumick, Linda C. Bridwell, and Richard C. Svindland. The document filed in this case was a second update of the original document, completed by Linda C. Bridwell and Richard C. Svindland. See attached resumes.

RICHARD C. SVINDLAND, P.E.

Professional Engineer with 16 years of experience in the water and wastewater fields working as an engineering consultant to municipal systems and as a technical resource to an investor-owned utility. Currently work as Technical Services Manager supervising 6 PE's and one technician for American Water's SE Region. The SE Region serves 5.8 million people, has annual revenues of $625 million(M), annual capital plan of $200M and 670 MGD of water plant capacity. Have worked for over 45 different municipal clients across the Southeastern United States and have knowledge of over 130 water and wastewater treatment facilities. ***Major projects and skills include:***

Wastewater Treatment Plants

Coatesville WWTP Expansion
Penn. American Water, *Coatesville, PA*
Technical Resource on a $25M plant expansion from 3.8 to 7 MGD. Project includes new headworks, aeration basin, final clarifiers, RAS/WAS pump station, effluent filtration, UV disinfection, effluent metering, reuse water system, SCADA, chemical feed, conversion of anaerobic digester to aerobic digester, solids handling and new Administration/Lab/ Maintenance Buildings.

Oconee River WPCP Expansion
City of Milledgeville, *Milledgeville, GA*
Design team leader responsible for $12M expansion to an existing 7 MGD Trickling Filter plant to a 10.5 MGD activated sludge / trickling filter plant. Expansion touched all process units from headworks to chlorine contact.

Jack's Creek WWTP Expansion
Monroe Utilities, *Monroe, GA*
Design team leader responsible for $2.2M expansion to an existing 3.4 MGD Trickling Filter plant. Expansion included new aeration basin, RAS/WAS pump station and chemical feed improvements.

Water Treatment Plants

New Pool 3 WTP on Kentucky River
Kentucky American Water, *Lexington, KY*
Project Leader for new 20 MGD WTP to serve Lexington, KY. This $140M project is currently under design and involves 30-miles of new 42-inch high service main in addition to the plant. Manage all aspects of project from property acquisition, to design, to hearings with the KY Public Service Commission.

Lake Oconee WTP
City of Madison, *Madison, GA*
Engineer of Record for new 2 MGD WTP. $5.5M project included raw water pump station and intake, transfer pump station, on-site raw water reservoir and dam, conventional surface water treatment plant, raw water and high service mains.

Richmond Road Station Hydraulic & Chemical Feed Improvements
Kentucky American Water, *Lexington, KY*
Project Manager for a $1.7M upgrade to allow 30 MGD to flow through an existing 25 MGD plant (unreliable) until source of supply solution is implemented. Project included Preliminary Engineering Report, meetings with regulators, PSC approval, inspection and facility shutdown coordination.

Education

Master of Science in Civil Engineering, *University of Kentucky, Lexington, KY, 2005*

Bachelor of Civil Engineering, Georgia Institute of Technology, Atlanta, GA, 1990

Professional Registrations

Professional Engineer in Georgia

Professional Engineer in Kentucky

Professional Associations

American Society of Civil Engineers (ASCE)

American Water Works Association (AWWA)

Water Environment Federation (WEF)

Water Distribution

Hydraulic Model Upgrade
Kentucky American Water, *Lexington, KY*
Responsible for new hydraulic model for the Lexington service area, which included 1,500 miles of main from 6-inch to 36-inch in size. Final work product was a 12,500 pipe extended period simulation model that predicted pressure to within 5 psi at all 8,000+ nodes.

Catawba Water Main
City of Ft. Mill, *Ft. Mill, SC*
Hydraulic and cathodic protection design of 15,600 LF of 20 & 24-inch DI and steel water main including 1000 LF utility bridge crossing of Catawba River.

Wastewater Collection

Southside Trunk Sewer
City of Cordele, *Cordele, GA*
Sole designer, Engineer of Record and construction manager for $2.2M - 27,800 LF 30-inch sanitary sewer with depths to 36 feet.

Poplar Road Pump Station
Newnan Utilities, *Newnan, GA*
Project Manager for $1.0M high head sewage lift station featuring surge vessel, 400 HP dry-pit submersible non-clog pumps and grinder.

Water Supply

Bear Creek Dam & Reservoir
Upper Oconee Basin Water Authority, *Watkinsville, GA*
Project Manger responsible for design of outlet tower, 72-inch prestressed concrete cylinder pipe and emergency spillway with design capacity of 20,000 cubic feet per second.

(Water Supply continued)

Sejerong Dam
Sejerong Island, *Indonesia*
US based Project Manager responsible for the structural design of an emergency overflow structure, 40-foot high retaining walls and a reservoir drainage structure in a high rain, earthquake prone area in Indonesia.

Skills

Skilled in use of surveying equipment such as levels, total station, GPS units and understand how these devices can be used in GIS systems.
Considerable experience with many software products such as: AutoCAD; Pipe2000; MS Word, Excel, Project & Powerpoint; Lotus Notes, JDEdwards, GTStrudl, SureTrak, VSAT, ARCGIS.
Able to develop rapport with utility operators and utility owners such that project outcomes are successful for all stakeholders.

Awards

Named 2003 Civil Engineer of the Year in Industry by the KY Section of ASCE.

Other Items of Interest

Habit a Genève, Suisse pour quatre ans. (Lived in Geneva, Switzerland 1979-82).
Active in Golf, snow skiing and softball.
Enjoy reading – professional journals and fiction.
Served as Chair of KY Section ASCE History & Heritage Committee – Assisted in the process of having McAlpine Lock & Dam Portland Canal in Louisville, KY become a Historic Civil Engineering Landmark.

Work Experience

American Water Works Service Co., Hershey, PA – Technical Services Manager – Southeast Region 7/04 to Present.

Kentucky American Water, Lexington, KY – Senior Operations Engineer 7/01 to 7/04.

Kentucky American Water Lexington, KY – Operations Engineer 10/99 to 7/01.

Wiedeman and Singleton, Inc., Atlanta, GA – Project Manager / Design Team Leader 2/97 to 9/99.

Keck and Wood, Inc., Atlanta, GA – Project Engineer 3/93 to 2/97.

Wiedeman and Singleton, Inc., Atlanta, GA – Associate Civil Engineer 6/90 to 3/93.

Professional Accomplishments

Signed & Sealed $10M in Water & Wastewater Projects since 1995.

Personally managed and installed over $75M in construction projects for AW since 1999.

Personally involved with over $200M in water and wastewater construction projects since 1990.

Part of American Water SER team that manages $175 – $200 M in water and wastewater CAPEX projects every year.

Six EITs who worked under my direction passed their PE examinations.

LINDA C. BRIDWELL, P.E.
Southeast Region Project Delivery and Developer Service Manager
Kentucky-American Water

Education

B.S. Civil Engineering – University of Kentucky

M.S. Civil Engineering – University of Kentucky

Masters of Business Administration – Xavier University

PROFESSIONAL HISTORY

May 1989 to Present	Kentucky American Water:
	Southeast Region Project Delivery and Developer Services Manager Director of Engineering Engineering Manager, Planning Engineer, Distribution Supervisor
May 1988 to October 1988	Kentucky Department of Highways -Engineer-In-Training

KEY EXPERIENCE

Ms. Bridwell is extensively experienced in reviewing facility needs, developing comprehensive plans for improvement and growth, and project implementation. Her work has included coordination with various regulatory agencies, an in-depth understanding of water treatment and distribution, and experience in staff management of professional and skilled personnel. She is responsible for the coordination of the Engineering Department at Kentucky American which includes the development and implementation for the capital investment plan of approximately $15 million annually. She is also responsible for project construction for American Water in Tennessee. She is project manager for Kentucky-American's water supply deficit resolution, which includes serving on the Bluegrass Water Supply Consortium made up of regional utility representatives.

Ms. Bridwell has full responsibility for regulatory compliance and interaction, personnel development, budgetary management, safety and environmental issues, quality control, business development, operations support, and strategic planning. Currently lead a team of 21, including five engineers, three operations specialists, three drafters, one stock clerk, five administrative assistants and four contract inspectors in two states. She is responsible for full development, implantation, and control of over $50 million in investment strategy with input from six other departments.

Among highlights of her work, she was the author of Kentucky American Water's Demand Management Plan, co-author of the 1991 Least Cost/Comprehensive Planning Study, and the 1994-2004 Kentucky American Water Demand Projections. She has served as the project manager for the Kentucky River Station Venturi Meters, the Richmond Road Station 1990 Improvements, and the Scott County Main Extensions. Under her management, Kentucky American Water has constructed 5 storage tanks, two pump stations, hydraulic improvements at the Richmond Road Station, a chlorine scrubber at the Kentucky River Station, and over 500 miles of pipe ranging from 3" to 24".

Ms. Bridwell has also worked with translating technical issues into easy-to-understand language, and is comfortable as a public speaker. She has provided testimony to the Kentucky Public Service Commission on issues related to the company's operations and she frequently serves as a public relations spokesperson to the media and local officials. She has served as an adjunct professor in the Civil Engineering Department at the University of Kentucky. She is a member of the Board of Directors of Hospice of the Bluegrass, Bluegrass Tomorrow, and has served with the Lexington Children's Theater. She is a committee chairman for the Lexington Affiliate Komen Foundation Pink Tie Gala and is active at Central Christian Church. She received the 1995 Daniel Meade award for Zone II for the American Society of Civil Engineers and was co-recipient of the 2001 UK Engineering Young Civil Engineer of the Year.

PROFESSIONAL CERTIFICATIONS

Professional Engineer in Commonwealth of Kentucky, Registration Number 17603.

PROFESSIONAL AFFILIATIONS

American Water Works Association
American Society of Civil Engineers, Bluegrass Branch - President
American Society of Civil Engineers, Kentucky Section – Current Past President
Lexington Chamber of Commerce – Lexington Leadership Alum, Chamber Member, Leadership Lexington Steering Committee member
Kentucky Society of Professional Engineers - Chapter Director, Leadership/Management Seminar Instructor

DAVID M. REVES, P.E.
American Water
1025 Laurel Oak Road
Voorhees, New Jersey 08043

EDUCATION:
- B.E., Youngstown State University (Civil Engineering), 1981
- M.S., Villanova University (Civil Engineering - emphasis in Water Resources Engineering), 1993.

LICENSES and PROFESSIONAL ORGANIZATIONS
- Registered Professional Engineer: NJ, PA, OH (active), CT, IN, KY, NH, WV (inactive)
- Water I Treatment and Water II Distribution Licenses, State of Ohio (currently inactive). Former water distribution instructor with the Operator Training Committee of Ohio.
- American Society of Civil Engineers (member since 1977)
- American Water Works Association (member since 1983)
- Water Environment Federation (member since 2002)

EMPLOYMENT HISTORY:
DATE and COMPANY: 2004 to Present, American Water, Voorhees, NJ
TITLE: Engineering Manager - Enterprise Capital Program
RESPONSIBILITIES: Responsible for the development and implementation of governance, policy, procedures, and reporting for the capital expenditure program for American Water. Assists in the strategic enhancement of American Water's Capital Investment Management (CIM) program to meet key business drivers.

DATE and COMPANY: 2002 to 2004, American Water, Chula Vista, CA
TITLE: Senior Operations Engineer
RESPONSIBILITIES: Primarily responsible for the overall project management of various water and wastewater projects for the American Water, Western Region properties. Work functions encompassed personnel supervision, capital project design and construction management, and operations and/or business development related projects. Specific responsibilities and projects include, but are not limited to:

Personnel Supervision
- Directly supervise one (1) Operations Engineer.
- Manage and coordinate the activities of outside consulting teams and in-house resources.

Capital Project Design and Construction Management
- Distribution Monitoring System Improvements (Monterey, CA): 136 site SCADA system.
- Begonia Residuals Handling Improvements (Carmel, CA): Modifications to meet State waste discharge requirements.
- Blue Ribbon Wells: Liaison to PRP (primary responsible party) responsible for removing VOC contamination from the El Monte Operable Unit of the Main San Gabriel Basin.
- Eardley Booster Station (Monterey, CA): New 1,700 gpm pre-fabricated booster station.
- Begonia Security Improvements (Carmel, CA): Implemented security related improvements based on the results of the Monterey vulnerability assessment.

Operations / Business Development Projects
- Coordinated one-time electrical maintenance inspections of all remote sites in Monterey, CA.
- Initiated the development of a technical maintenance department for the Western Region.
- Served as the Western Region champion for the new Capital Investment Management program.
- Filled the role of Western Region security officer.

- Performed and/or managed all activities associated with 24 security vulnerability assessments for the Western Region.
- Completed a non-revenue water assessment for Clovis, NM
- Reviewed developer sanitary sewer collection systems for Texas and Hawaii American Water.
- Provided technical assistance to the business development department in evaluating the Tampa Bay, FL water desalination plant.

DATE and COMPANY: 1991 to 2002, American Water Works Service Co., Voorhees, NJ
TITLE: Senior Design Engineer
RESPONSIBILITIES: Primarily responsible for the overall design phase project management for various large and complex American Water Works capital projects (up to $100 M). Work functions encompassed personnel supervision, capital project design management, special non-design related projects, and other general technical responsibilities. Specific responsibilities and significant projects included, but are not limited to:

Personnel Supervision

- Managed and coordinated the activities of outside consulting teams and in-house resources.
- Directly supervised one (1) New Jersey-American engineer for a one-year period.

Capital Project Design Management

- Swimming River Treatment Plant Improvements (Tinton Falls, NJ): 36 MGD surface water treatment plant renovation including ozone installation and pilot study.
- Huntsville Treatment Plant (Huntsville, PA): New 4.5 MGD (expandable to 6.0 MGD) adsorption clarifier plant, raw water intake, and pilot study.
- Bluestone Treatment Plant (Fayette County, WV): New 5 MGD (expandable to 15.0 MGD) lamella settler treatment plant with 100' vertical intake lift.
- Weston Treatment Plant (Weston, WV): 2 MGD Pulsa-Pak treatment plant and intake.
- Fayette Plateau Water Treatment Plant (Beckwith, WV): New 4.0 MGD (expandable to 12.0 MGD) Superpulsator treatment plant with remote intake.
- Kanawaha Valley Water Treatment Plant Expansion (Charleston, WV): High rating of existing Accelator clarifiers with tube settlers (including pilot study), new residuals handling facilities, clearwell baffling, and filtration improvements.
- Bluegrass Water Project (Louisville - Lexington, KY): 52-mile, 36-inch finished water pipeline with two booster stations, chemical feed, and flushing facilities. Preliminary work included evaluation of six raw water and finished water alternatives.
- Jumping Brook Treatment Plant Improvements (Neptune, NJ): Residuals handling and chlorine storage improvements to an existing 30 MGD surface water treatment plant.
- Butler Intake (Butler, PA): New 8 MGD raw water pump station and intake with zebra mussel control.
- Shire Oaks Surge Control (Pittsburgh, PA): Surge model study and surge tank design for 36 MGD booster station.
- Tiffin Treatment Plant Improvements (Tiffin, OH): New above ground clearwell, transfer pumps, chemical feed, SCADA system, and control room.
- Marion Treatment Plant Improvements (Marion, OH): Replacement of transfer pumps and chemical feed systems, upgrade of filtration process.
- Kentucky-American SCADA Upgrade (Lexington, KY): Upgrade of existing SCADA system.
- Clays Mill Storage Tanks and Pump Station (Lexington, KY): 3 MG wire-wound, prestressed concrete storage tank and 9 MGD booster station.
- Aldrich Treatment Plant Intake Evaluation (Pittsburgh, PA): Hydraulic modeling to determine impact to intake due to lowering of the pool by the U.S. Army Corps of Engineers, followed by subsequent design recommendations.

Non-Design Related Projects

- Comprehensive Planning Studies: Ellwood City PA (production), Kane, PA (production), Kentucky-American Water Company (production and storage), Charleston, WV (production).
- Contract Operations Assessments: Buffalo, NY (first contract awarded to AAET), Nova Chemical (Pittsburgh, PA), Marion, OH.
- Initiated, developed, and implemented Knowledge Management practices for American Water (i.e. Lotus Notes).
- Lead in-house team in developing American Water's Buried Infrastructure Management Plan.
- Developed American Water Risk Assessment Methodology with security department.
- Value engineering team member for the Hingham Treatment Plant (Hingham, MA) .
- Provided technical review for AWWARF Project 2686 - Verification and Control of Low-Pressure Transients in Distribution Systems.
- Provided technical review of AWWA/ASCE Water Treatment Plant Design, Third Edition, Chapter 16 (Hydraulics).

General Technical Responsibilities

- American Water Works materials management committee member and technical liaison.
- Developed or responsible for the maintenance of the following American Water Works company standards:
  - A1 - Professional Engineering Services Request for Proposal
  - P4 - Water Quality Testing for New Well Supplies
  - T9 - Compressed Gas Feed Systems and Storage Facilities
  - T11 - Evaluating the need for Altitude Valves on Water Distribution Storage Tanks
- Head or member of the following American Water technical committees:

Head	Member (cont.)
* Gaseous chemical feed systems	* Liquid chemical feed systems
* Control strategies and process logic	* Filtration
* Intakes	* Infrastructure replacement planning
* Pipe and fittings	* Laboratory facilities
* Sludge dewatering	* Ozonation
* Surge analysis	* Project management and scheduling
* Valves and hydrants	* Pumps
Member	* Storage tanks
* Cathodic protection	* Wells
* Dry chemical feed systems	

- Member of the following Thames Water Knowledge Communities:
  - * Capital Investment Management
  - * Desalination and Reuse

DATE and COMPANY: 1998 to 1991, American Water Works Service Co., Voorhees, NJ
TITLE: Design Engineer
RESPONSIBILITIES: Responsible for the overall design phase project management for various American Water Works Company capital projects. Specific responsibilities and significant projects included, but are not limited to:

Personnel Supervision

- Managed and coordinated the activities of outside consulting teams and in-house resources.

In-House Designs

- Kentucky River and Richmond Road Ammonia Feed (Lexington, KY): Liquid ammonia feed and storage systems for chloramination.
- Old Orchard and Kingston Wells (Cherry Hill, NJ): Source wells and chemical feed.
- Ashdale Pump Station (Alexandria, VA): New chlorine and ammonia feed and storage

systems.

- Ellwood Treatment Plant Phase I and II Improvements (Ellwood City, PA): Modifications to existing surface water treatment plant including new laboratory, chemical feed systems, filter and backwash modifications, and pump replacements.
- Kane Washwater Pumps (Kane, PA): New wash water pumping system to improve backwash rates.
- Tiffin Wash Water Tank (Tiffin, OH): New 100,000 gallon ground storage steel wash water tank, piping, and filter gallery improvements.
- Ellwood Wash Water Tank (Ellwood City, PA): New 107,000 gallon ground storage steel wash water tank, piping, and filter gallery improvements.

Capital Project Design Management

- Kentucky River Station Intake (Lexington, KY): 62 MGD reliable intake pump upgrade including control valve vault, 400-foot vertical lift with new parallel 36-inch piping, 22 MGD transfer pump station, and associated SCADA controls. Project also include hydraulic scale modeling of the intake.
- Kentucky River Aquatic Study (Lexington, KY): Study to determine the effects of mining (lowering) the pool level at the Kentucky River intake.
- Kentucky River Station Chemical Building (Lexington, KY): New 40 MGD pre and post chemical treatment facility.
- Kentucky River Station Residuals Handling Improvements (Lexington, KY): Modifications to existing residuals handling facilities and practices.
- Kane Wells (Kane, PA): New source wells and chlorination.
- Hampton Wells (Hampton Beach, NH): New source wells and piping.

DATE and COMPANY: 1983 to 1988, Ohio Water Service Co., Struthers, OH
TITLE: Distribution Superintendent
RESPONSIBILITIES: Responsible for the operations, maintenance, customer service, and meter reading activities of a 12,500 customer potable water distribution system, and a 10 customer industrial raw water distribution system. Specific responsibilities included, but are not limited to:

Personnel Supervision

- Directly supervised up to 13 non-exempt employees (7 maintenance workers, 3 servicemen, 3 meter readers).
- Directly supervised 1 exempt employee (maintenance foreman).
- Directly supervised up to 4 part time employees (summer college students).

Operational Management Responsibilities

- Maintenance of the distribution system (pipeline, valve, and hydrant repairs and new installations).
- Maintenance of customer service lines (repairs and new installations).
- Meter testing and installation.
- Investigating customer service complaints.
- Meter readings, check readings, transfer of data to billing department.
- Coordination of all distribution activities with production department as necessary.
- Monitoring of Unaccounted For Water and scheduling leak surveys as needed.
- Material purchasing and inventory.
- Upkeep of records and distribution system maps.
- Fleet and building upkeep.

Engineering Responsibilities

- Responsible for all developer pipeline work including estimating, contract administration, material purchasing, construction, and commissioning.

- Fire flows, hydraulic testing, and computer modeling.
- Designed and managed the construction of an interconnection with a neighboring utility.
- Implemented the company's first automated meter reading system (Porta-Processor).
- Oversaw underwater repairs with divers to McKelvey Lake dam intake sluice gates.

DATE and COMPANY: 1981 to 1983, Pittsburgh-Des Moines Corporation, Pittsburgh, PA
TITLE: Engineer
RESPONSIBILITIES: Involved in various aspects of steel storage tanks and vessels over a two-year apprenticeship program. Specific responsibilities included, but are not limited to:

- Drafting: Elevated water storage tanks.
- Cost Estimating: Liquid oxygen (LOX) and liquid nitrogen (LIN) tanks.
- Project Engineering: Liquid oxygen (LOX) and liquid nitrogen (LIN) tanks.
- Design Engineering: Lifting mechanisms for Lawrence-Livermore Laboratory vessel, liquid oxygen (LOX) and liquid nitrogen (LIN) tanks, .
- Field Engineering: Surveying, inspection, and layout for the containment vessels and other miscellaneous storage tanks at the Seabrook, NH nuclear power plant.
- Construction Management: Estimating and negotiating change orders.

PAPERS AND PRESENTATIONS:

- Reves, D.M., Schmitt, S.P. Aging Buried Infrastructure Management Challenges and Strategies. Environmental Protection Agency Distribution System Workshop, Voorhees, NJ, 2002.
- Reves, D.M. Optimizing Control Logic for Water Treatment Plants. NJ AWWA Annual Conference, Atlantic City, NJ, 1998.
- Reves, D.M., O'Brien, T.Z. Project Management / Document Control Utilizing Lotus Notes. AWWA Computer Conference, Austin, TX, 1997.
- Reves, D.M., Casale, R.J. Optimization of Distributed Control Systems. AWWA Annual Conference, Atlanta, GA, 1997.
- Reves, D.M., McClain, D.J., Funk, J.E., Wood, D.J. The Effect of Air Valve Sizing on Hydraulic Transients. AWWA Distribution System Symposium, Portland, OR, 1996.
- Reves, D.M. Misconceptions About Distribution System Hydraulics. American Water Works Distribution Maintenance Management Roundtable, Delran, NJ, 1996.
- Reves, D.M. Water Hammer and Surge Analysis. Distribution Maintenance Management Roundtable, Delran, NJ, 1996.
- Reves, D.M. Safety Considerations and Requirements in Chemical Feed System Design. AWWA Engineering Design Conference, Cincinnati, OH, 1994.

Gary A. Naumick, P.E.
Director of Capital Program and Asset Planning
American Water Works Service Company

Gary Naumick holds the position of Director of Capital Program and Asset Planning for American Water.

In this capacity, he is responsible for the strategic planning and management of American Water's capital expenditures of over $600 million annually. Mr. Naumick and his team are also responsible for the development of comprehensive asset plans for each of American Water's 200 plus water systems. Mr. Naumick joined American Water in 1986 as a Senior Planning Engineer. In 1988, he was promoted to Director of Planning, and advanced to his current position in 2004.

Mr. Naumick has over 25 years of experience in the water utility field. Prior to joining American Water, he was employed by US Environmental Protection Agency Region III in its drinking water program.

EDUCATION

New Jersey Institute of Technology - Master of Science, Engineering Management (2002)

Pennsylvania State University - Bachelor of Science, Civil Engineering (1977)

PROFESSIONAL AFFILIATIONS AND LICENSES

American Water Works Association
Conservation Planning, Evaluation and Research Committee (1997-2003)

New Jersey Section AWWA
"Water For People" Committee

Professional Engineer - State of Pennsylvania

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 2

Witness: Linda C. Bridwell

2. Provide all correspondence, internal memoranda, and electronic mail messages in which Kentucky-American employees or officials discuss the current water storage capacity analysis or Kentucky-American's application for deviation.

RESPONSE

Please see attached.

Linda Bridwell
12/28/2005 09:38 AM

To: David Kaufman, Richard C Svindland/KAWC/AWWSC@AWW
cc:
Subject: Fw: Case 2005-00546

Linda Bridwell, PE
Project Delivery & Developer Services Manager - WV, KY TN
Southeast Region
2300 Richmond Road
Lexington, KY 40502
Tel: 859-268-6373
Fax: 859-268-6374

----- Forwarded by Linda Bridwell/KAWC/AWWSC on 12/28/2005 09:39 AM -----

"Lindsey Ingram" <Lindsey.Ingram@skp.com>
12/27/2005 11:23 AM

To: <nrowe@amwater.com>, "Linda Bridwell" <bridwell@kawc.com>, <hmiller@kawc.com>
cc: "Lindsey Ingram III" <L.Ingram@skp.com>
Subject: Case 2005-00546

The Application for a deviation from the storage requirement has been assigned Case No. 2005-00546 at the PSC and I attach a copy of the filing. Please let any others who should be included on this e-mail know. KAW_Application_122205.pdf

Linda Bridwell

12/20/2005 02:29 PM

To: Richard C Svindland/KAWC/AWWSC@AWW, David Kaufman
cc: "LINDSEY INGRAM" <ingramjr@skp.com>, Herb Miller/KAWC/AWWSC@AWW, Nick Rowe/KAWC/AWWSC@AWW
Subject: Storage Analysis

Attached is the revised storage analysis that incorporates the new facilities that have been placed in service recently (or in the case of Eastland tank will be next week). I have incorporated two versions - the one with changes from the previous document and the edited version. I am still missing a couple of cost items I am running down this afternoon.

I'm asking Rich to review for technical matters and recommendations. I am essentially saying we now have storage to meet 64% of our average day through 2020, with standby pumping for the rest. There is only one additional tank to be constructed between now and 2010. I am asking that the waiver by extended through 2020.

If it meets with approval - it is ready to be filed this week.

KAWC Storage Capacity Analysis--12_20_05 draft.doc

KAWC Storage Capacity Analysis--12_20_05 draft no tracking.doc

Linda Bridwell, PE
Project Delivery & Developer Services Manager - WV, KY TN
Southeast Region
2300 Richmond Road
Lexington, KY 40502
Tel: 859-268-6373
Fax: 859-268-6374

Linda Bridwell
12/16/2005 12:11 PM

To: Herb Miller/KAWC/AWWSC@AWW
cc:
Subject: Re: PSC Response - Eastland Tank

OK, but the letter was going to Michael Burford. Want me to just call George Wakim?

Linda Bridwell, PE
Project Delivery & Developer Services Manager - WV, KY TN
Southeast Region
2300 Richmond Road
Lexington, KY 40502
Tel: 859-268-6373
Fax: 859-268-6374

Herb Miller

Herb Miller
12/16/2005 12:07 PM

To: Linda Bridwell/KAWC/AWWSC@AWW
cc: Nick Rowe/KAWC/AWWSC@AWW
Subject: Re: PSC Response - Eastland Tank

I think it is worth a telephone call to your contact at the PSC just to let them know.

Herbert A. Miller, Jr.
Regional Corporate Counsel
Kentucky, Tennessee and Georgia
American Water Works Service Company, Inc.
2300 Richmond Road
Lexington, KY 40502
e-mail: hmiller@kawc.com
ph. 859-268-6339
fax 859-268-6327

Linda Bridwell
11/11/2005 02:13 PM

To: Richard C Svindland/KAWC/AWWSC@AWW
cc:
Subject: Re: Storage Capacity Analysis

I thought I looked there, but all I found was the draft. Sorry to bother you!

Linda Bridwell, PE
Project Delivery & Developer Services Manager - WV, KY TN
Southeast Region
2300 Richmond Road
Lexington, KY 40502
Tel: 859-268-6373
Fax: 859-268-6374

Richard C Svindland

Richard C Svindland
11/11/2005 12:40 PM

To: Linda Bridwell/KAWC/AWWSC@AWW
cc:
Subject: Re: Storage Capacity Analysis

It was located in the production folder of the IRP IP 98-01 directory.

Richard C. Svindland, P.E.
Technical Services Manager SE Region
American Water

800 W. Hershey Park Dr.
Hershey, PA 17033

717 531 3231 - PA Office
717 531 3282 - PA Fax

Linda Bridwell

Linda Bridwell
11/11/2005 11:17 AM

To: Richard C Svindland/KAWC/AWWSC@AWW
cc:
Subject: Re: Storage Capacity Analysis

OK, where'd you find it?

Linda Bridwell, PE
Project Delivery & Developer Services Manager - WV, KY TN
Southeast Region
2300 Richmond Road
Lexington, KY 40502
Tel: 859-268-6373
Fax: 859-268-6374

Linda Bridwell

10/17/2005 04:23 PM

To: Herb Miller/KAWC/AWWSC@AWW
cc: "LINDSEY INGRAM" <ingramjr@skp.com>, Nick Rowe/KAWC/AWWSC@AWW, David Kaufman
Subject: Storage Deviation - KY

Herb,
I was reminded recently that our deviation from PSC requirements on storage is about to expire December 31, 2005. It might be appropriate to provide the PSC with an update of what we have accomplished and request an extension of that deviation. I would like to get something drafted for filing by mid-November. Do you want to handle this or should I work with Lindsey on it?
Linda

Linda Bridwell, PE
Project Delivery & Developer Services Manager - WV, KY TN
Southeast Region
2300 Richmond Road
Lexington, KY 40502
Tel: 859-268-6373
Fax: 859-268-6374

Linda Bridwell
03/22/2005 10:35 AM

To: David Kaufman
cc: Richard C Svindland/KAWC/AWWSC@AWW
Subject: Storage Analysis Summary

Dave,
I've attached a draft of the brief summary on the storage situation for you. Let me know if we need more detail. I did not try to go into the details of the two gradients we have, and how one actually needs to have a full average day and the other can get by with half-day & one-half from the treatment plant diesels which is why the numbers aren't a clear average day divided by 2. If it needs some clarification so that you are comfortable, let me know.
Also, if anyone is looking carefully we actually have two small tanks that are out of service from a system we acquired in 1998 and connected to the Central Division. They are unable to operate at our Central Division gradient (way too low) and too small to make it worthwhile to put a booster on, so they are not included in the numbers.

Linda

Storage Situation 3_22_05 draft.doc

Linda Bridwell, PE
Project Delivery & Developer Services Manager - WV, KY TN
Southeast Region
2300 Richmond Road
Lexington, KY 40502
Tel: 859-268-6373
Fax: 859-268-6374

DRAFT

Kentucky American Water
Finished Water Storage
March 22, 2005

The Kentucky Public Service Commission ("PSC") requires that all regulated water utilities maintain the equivalent of one average day demand volume in finished water storage within its system. In 1988, Kentucky American Water ("KAW") applied for and received a deviation from the PSC requirement until July 1, 1993 based on a proposed third treatment plant under design the time.

In 1992, further analysis was completed. This analysis reviewed KAW's reliability and concluded that one half of one average day demand could be supplied to the system through the use of existing diesel power at the Richmond Road treatment plant and the other half would be supplied from finished water storage. Based on this analysis, KAW requested and received a further deviation from the PSC through December 31, 2005 based on the proposed construction of five new storage tanks.

In August 2001, KAW purchased the Northern Division system which has adequate storage capacity.

In July 2002, KAW experienced a power outage at its Kentucky River Station treatment plant during a peak demand period. This led to a system-wide boil water advisory. As part of the PSC's required investigation into the incident, the storage analysis was revisited. KAW determined at that time that one of the remaining five proposed storage tanks that was not yet constructed would be converted from a 3.0 MG ground storage tank to a 2.0 MG elevated storage tank that would provide a short duration of reliability within the system if a recurrence of a peak event power outage were to happen.

KAW has completed three of the five proposed tanks, with a fourth under construction that will be completed in early fall. The fifth, now elevated tank, is designed and is awaiting a Certificate of Convenience and Necessity from the PSC. Although the construction schedule calls for completion by December 31, 2005, the contractor has indicated a $216,000 deduction in his contract price to have the construction completion backed to May 2006. KAW has pointed this out to the PSC and will likely authorize the extended construction time.

With the construction of the fifth tank, KAW will have 22.59 million gallons in finished water storage in the Central Division, with an average day demand of 42 million gallons. With a complete review of usable storage, location of storage in the Scott County area, and only 19.4 MG in standby pumping at the intake facilities, KAW will just have enough storage and standby treatment capacity to reliably have one average day demand as required in the intent of the PSC regulation. Because KAW continues to add 2500 customers per year on average, it has proposed within the 5-year plan to begin work on the next 3.0 MG pumped storage facility that will keep finished water storage needs on pace within growth in the system. The location and construction of the next tank is also

set to coincide with the completion of the first phase of the Bluegrass Water Supply Commission's water transmission grid.

It will be necessary in the latter half of 2005 for KAW to apply to the PSC for an additional deviation from the storage requirement, with an updated analysis and proposed construction within the five to ten-year time frame. KAW believes it is likely to be granted, as long as storage volume continued to receive the appropriate level of attention in construction plan and reliability needs continue to be met.

Linda Bridwell
01/14/2005 09:14 AM

To: Richard C Svindland/KAWC/AWWSC@AWW
cc:
Subject: Re: PIP for Wedgie Tank

Thanks, Rich.

Linda Bridwell, PE
Project Delivery & Developer Services Manager - WV, KY TN
Southeast Region
2300 Richmond Road
Lexington, KY 40502
Tel: 859-268-6373
Fax: 859-268-6374

Richard C Svindland

Richard C Svindland
01/14/2005 07:56 AM

To: Linda Bridwell/KAWC/AWWSC@AWW
cc:
Subject: PIP for Wedgie Tank

Linda,

Attached are my PIPs and attachments. Originals are located in the project directory on F:


KY 12020301 PIP.doc IP-03-01-PIP Appendicies.)

Richard C. Svindland, P.E.
Technical Services Manager SE Region
American Water
2300 Richmond Road
Lexington, Kentucky 40502
859 335 3833
859 268 6327 f

Project Title	:	**12020301 2 MG Elevated Storage Tank**
Subsidiary Company	:	**Kentucky American Water**
Project Manager	:	**Richard C. Svindland**
Project Status	:	**PROJECT IMPLEMENTATION PROPOSAL**

1.0 SUMMARY

The proposal is for construction of a 2 million gallon elevated storage tank and associated 24 inch main to ensure reliable service to the Main Service area of KAW's distribution system during plant power outages and high demand days. This project is also needed to comply with the Public Service Commission's Order No. 93-432, which requires increasing storage capacity in KAW's service area.

1.1 Project Objectives

Peak demands often cause pressure problems at the high elevations in the Main Service Area, namely in the Strader Dr. and Winchester Road area. The Public Service Commission (PSC) has ordered water systems to have a minimum storage capacity equal to the average daily consumption (40 MG for KAW). Kentucky American Water received a waiver on that requirement, but must construct 5 tanks by December 31, 2005. With four new tanks already constructed or under construction, this is the final tank project of the five tanks proposed. The Main Service Area of Lexington is operated as a pressurized system with only 0.5 MG of floating storage. As a result, during loss of power episodes at either of KAW's two treatment plants low pressure occur throughout the system. Construction of this new elevated storage tank will stabilize pressures in the local area, increase system storage to 50% of average day demand and allow response time should a power trip occur at either of the treatment plants.

1.2 Recommended Solution

In order to increase storage capacity and provide reliable service to our service area, five tanks have been proposed to increase our storage capacity from 12.83 million gallons to 22.58 million gallons. Three tanks have already been installed increasing our capacity to 19.58 million gallons, one 1 MG tank is under construction and it is recommended to construct a 2 million gallon elevated tank resulting in 22.58 million gallons of storage capacity. This 2 MG Elevated Storage tank will also increase floating storage amount in the Main Service Area from 0.5 MG to 2.5 MG, thus reducing the risk of low pressures during plant power trips. This tank also stabilizes pressures in the Strader Drive Winchester Road area to between 30 and 43 PSI.

1.3 Cost and Program

- Total project cost is $3,170,000.
- Project completion is December 2005.

1.4 Project Issues and Risks

In July of 2002, power was lost at KRS while the plant was pumping at full capacity (approx. 48 MGD). The entire system was placed on a boil water advisory because several areas around the Main Service Area experienced pressures below 20 psi for over 10 minutes. Two locations had a pressure of 0 psi for 10 minutes. The area in the vicinity of the proposed tank is at a high elevation and routinely sees pressures below 30 psi during the filling of ground storage tanks and during high demands. The proposed tank would alleviate these low pressure issues while increasing the storage as requested under KY PSC order 93-432.

1.5 Changes Since Previous Approval

IP 03-01 was approved for $410,000 for the land acquisition, design and bidding of the tank. Bids have been received and the Division of Water has approved the tank portion of the project.

Kentucky American Water expects a Certificate of Convenience and Necessity from the Public Service Commission by the end of March 2005. Plans and specifications for the 1200 feet of 24-inch main required to connect the tank to the distribution system are currently being reviewed by the State and City and are expected to be approved by February. An increase of $2,760,000 is needed for the construction of 2 MG Elevated Storage Tank and associated appurtenances.

2.0 BACKGROUND

2.1 Increase in customers has caused demands to increase significantly and will continue to increase. June 13, 2000, service pumpage of 66 MGD was reached and August 5, 2002, service pumpage of 72 MGD was reached. With the continued increase in customer demand, it is critical to provide reliable storage capacity. Currently there are 13 tanks in service throughout the main service area totalling 19.58 million gallons and a single 1 MG ground storage tank under construction.

2.2 One additional tank is proposed, to bring the total storage capacity to 22.58 million gallons. This tank will be located at the corner of Industry Road and Eastland Drive inside New Circle Road in the vicinity of Winchester Road at one of the highest ground elevations in the service area. One acre of land have been optioned in the corner of a shopping mall parcel. The land will be purchased upon receipt of the Public Service Commission approval. All necessary permits have been obtained. All bids are received and awards of bids will take place per Public Service Commission approval which is expected March 2005.

2.3 The original total cost for the entire project as stated in the IP 03-01 memo was estimated at approximately $3,000,000. The final cost estimated at this time is approx. $3,200,000 due to final land cost, caisson foundation requirements and a fast completion time for the tank. The tank cost is based on a multi-leg tank configuration. The project could be reduced by $95,000 if a composite tank is selected.

3.0 PROJECT JUSTIFICATION AND PRIORITISATION

3.1

Purpose Code	Description	%	Measure	Units	Target
WP – RC OR 02	Water – Other Regulations	100			

3.2 It is critical that approval be granted in January 2005 to ensure construction begins by March 2005, contingent on receiving the PSC Certificate, on the tank. If construction is delayed, there is a risk that late fall or winter weather could reduce progress and cause the tank to not be completed by the end of the year. This will leave Kentucky American Water out of compliance with the PSC Order and would effect the rate case forward look test year of which the capital for the tank is included. This project was originally authorized for design and land purchase only as Investment Project 12020301.

4.0 PROJECT OUTPUT AND BENEFITS

4.1 The intended outputs include the addition of a 2 million gallons of floating storage within the Main Service Area of KAW's system, increasing the total amount of floating storage in the Main Service Area to 2.5 MG and stabilizing pressures in a high ground elevation area. This storage also provides reaction time should either of the two water treatment plants experience a power trip.

5.0 SCOPE AND OPTIONS

5.1 This project is a sole option. Design is complete, land is secured, and construction needs to begin in a timely manner.

6.0 FINANCIAL STATEMENT

6.1 A cost summary is attached in Appendix A2 with a total project cost of $3,200,000.

Component $ million	Total	2004	2005	2006	2007
Development Costs					
Design & Construction Cost	$3.20	0.48	2.69		
Project Total	**$3.20**	**0.48**	**2.72**		
Advances & Contributions					

6.2 Kentucky American Water anticipates that the cost of operation of its facilities will increase because of this installation. Routine maintenance expenses will increase including: formal tank inspections every five to seven years, estimated to cost $5,000 each, interior recoating every 15 years at $300,000 beginning in 2020; exterior recoating every 20 years at $250,000 beginning in 2025. There will be additional costs attributable to the facilities such as depreciation and the additional cost of debt and equity.

6.3 Additions to the proposed project include bidding and construction, which are detailed in the cost summary attached in Appendix A2.

6.4 KAW has not constructed a two million gallons elevated water tank since 1964. As such, comparable unit costs are not available.

7.0 PROCUREMENT

7.1 A consultant engineer, Strand Associates, handled the design and bid administration. There is one contract with the consultant engineer for the design, bidding and resident inspection of this project, one contract for the construction of the tank and one contract for the installation of the 1200-feet of 24-inch main to supply the tank. The project was bid with a base bid for a multi-leg steel ellipsoidal tanks, an alternate bid for a fluted column tank and an alternate bid for a composite tank. The tank construction contractor will buy all materials according to KAW specifications. Four bids were received for the tank; however, not all bidders bid on each alternate. The pipeline portion of the project will be bid to KAW's 5 pre-qualified contractors with KAW furnishing all the material. Details of the tabulation of bids are included in Appendix A4.

8.0 PROGRAM

8.1 Include a high level schedule of the major activities; include key milestone dates in the execution of the project (e.g. receipt of key permits, award of key contracts/orders, completion of construction, in service). As a minimum the following should be included:

Project Need Identification (PNI)	n/a
Project Implementation Approval (PIA)	01/05
Main Contract Let (if applicable)	01/05
Start on Site	03/15
Substantial Completion	11/05
Take Over	12/05
Post Project Review	01/06

9.0 ISSUES AND RISKS

9.1 The main risk to the project is completing the project prior to the end of the year. Many of the tank contractors indicated that depending on weather they may be unable to complete the painting by the end of the year and that they may have to come back in Spring of 2006 to finalize the tank painting. The low bidder offered a deduct of $216,000 to delay substantial completion until May of 2006.

9.2 There are no anticipated risks associated with potential claims and/or compensation payments.

9.3 In order to reduce the risk of a late completion as much as possible it will be necessary to award the contract as soon as possible to the Tank Contractor to insure that they are able to be mobilized an on site by the middle of March and so they can start shop drawing and procurement efforts in January. Generally, KAW does not execute a contract prior to PSC approval but in this case it is desired to expedite completion. The risk with signing the agreement and authorizing the starting of procurement and shop drawing preparation is that the PSC could not approve the project. This risk is low considering the PSC has requested the tank as part of their Order 93-432.

10.0 RECOMMENDATION

10.1 It is recommended that the Capital Investment Management Committee (CIMC) grant approval for the increased capital expenditures of $2,79,000 for a total project cost of $3,200,000 with project completion in December 2005. It is further recommended that the CIMC grant approval to allow KAW to sign an agreement with the tank contractor so shop drawings and steel procurement commence as soon as possible.

Author's Name(s)	Richard C. Svindland
Date	1/13/05
Version	1.0

APPENDICES

A1 PIA Control Data Sheet

Associated form – CMF3.45 – appropriately signed.

A2 Cost Summary

A3 Economic Analysis

A4 Tabulation of Bids

A5 Schedule

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL INVESTMENT PLAN PROJECT 03-01

2 MG ELEVATED STORAGE TANK

ITEM	RESPONSIBLE ENTITY	TOTAL ESTIMATED COST
Preliminary Design	KAWC / Consultant	$ 10,000
Final Design	Consultant	$ 105,000
Utility Plant Construction		
Act #303 Land & Land Rights	KAWC	$ 290,000
Construction Admin. / Inspection	KAWC / Consultant	$ 50,000
Materials	KAWC	$ 100,000
Construction	Contractor	$ 2,367,000
	Sub-Total	$ 2,922,000
O&C (+/- 5%)		$ 120,200
Engineering Overhead (+/- 2%)		$ 48,160
	Sub-Total	$ 3,090,360
AFUDC		$ 112,300
	Total	**$ 3,202,660**
	Estimate	**$ 3,200,000**

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL INVESTMENT PLAN PROJECT 03-01

2 MG ELEVATED STORAGE TANK

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	Prior Carryover	2005												TOTAL 2005
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Preliminary Design	KAWC / Consultant	$ 43,500													$ -
Final Design	Consultant	$ 71,500													$ -
Land Acquisition	KAWC	$ 275,000	$ 7,500	$ 7,500											$ 15,000
Const. Admin. / Inspection	KAWC / Consultant	$ -			$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 50,000
Materials	KAWC	$ 92,100		$ 7,900											$ 7,900
Construction	Contractor	$ -			$ 233,700	$ 233,700	$ 233,700	$ 233,700	$ 233,700	$ 233,700	$ 233,700	$ 233,700	$ 233,700	$ 233,700	$ 2,337,000
SUB-TOTAL		$ 482,100	$ 7,500	$ 15,400	$ 238,700	$ 238,700	$ 238,700	$ 238,700	$ 238,700	$ 238,700	$ 238,700	$ 238,700	$ 238,700	$ 238,700	$ 2,409,900
O&C (+/- 5%)		$ -	$ 400	$ 800	$ 11,900	$ 11,900	$ 11,900	$ 11,900	$ 11,900	$ 11,900	$ 11,900	$ 11,900	$ 11,900	$ 11,900	$ 120,200
Overhead (+/- 2%)		$ -	$ 150	$ 310	$ 4,770	$ 4,770	$ 4,770	$ 4,770	$ 4,770	$ 4,770	$ 4,770	$ 4,770	$ 4,770	$ 4,770	$ 48,160
AFUDC		$ -	3,000	3,100	3,900	5,400	6,900	8,400	9,900	11,400	12,900	14,300	15,800	17,300	$ 112,300
CASH FORECAST		$ 482,100	$ 11,050	$ 19,610	$ 259,270	$ 260,770	$ 262,270	$ 263,770	$ 265,270	$ 266,770	$ 268,270	$ 269,670	$ 271,170	$ 272,670	$ 2,690,560

KENTUCKY-AMERICAN WATER COMPANY
ECONOMIC ANALYSIS OF THE IMPACT OF CAPITAL
SPENDING PROPOSAL
2 MG ELEVATED STORAGE TANK

Determination of Revenue Requirement		
Authorized Rate of Return on Common Equity		11.00%
Federal Income Tax Rate		35.00%
Return on Common Equity before FIT		16.92%
State Income Tax Rate		8.25%
Required Rate of Return on CE for Project		18.44%
Common Equity Ratio for Project		40.00%
Weighted Cost of Common Equity before Tax		7.38%
Long Term Debt Ratio for Project		60.00%
Estimated Cost Rate for New Debt		8.00%
Weighted Cost of Debt		4.80%
Total Pre-Tax Cost of Capital		12.18%
Total Estimated Cost of Project		$ 3,200,000
Investment by Others		0
Net Investment Financed by Company		$ 3,200,000
New Common Equity	$ 1,280,000	
New Long Term Debt	1,920,000	

Total Revenue Requirement		Amount	Rate
Required Pre-Tax Operating Income		$ 389,760	12.18%
Depreciation Rate	1.180%	37,760	1.18%
Property Tax Rate	0.7037%	22,518	0.70%
Change in Operation & Maint. Expense		0	0.00%
Revenue from New Customers		0	0.00%
Total Net Revenue Requirement		$ 450,038	14.06%
Revenue Tax Rate	0.14537%	655	0.02%
Total Revenue Requirement		$ 450,693	14.08%
Latest 12 Months Revenue - 09/30/2002		$ 42,262,154	
Required Price Increase		1.07%	

TABULATION OF BIDS
for
2 MG ELEVATED STORAGE TANK
for
KENTUCKY AMERICAN WATER
LEXINGTON, KY

BIDS RECEIVED UNTIL 2:00 PM, local time, JANUARY 11, 2005

	Caldwell Tanks P.O. Box 35770 Louisville, KY 40232	Phoenix Fabricators 182 South Country Rd 900E Avon, IN 46123	Pittsburg Tank & Tower Co. P. O. Box 40 Sebree, KY 42455	CB&I 3600 Mansell Rd, Suite 230 Alpharette, GA 30022	Landmark Structures 1665 Harmony Road Forth Worth, TX 76177
Notes:	(1)(2)	(1)(2)		(1)(2)	(1)(2)
Base Bid - Multi Leg Tank:	**$ 2,337,000.00**	**$ 2,400,000.00**	**NO BID**	**NO BID**	**NO BID**
Deduct to Delay Substantial Completion until May 2006	$ 216,000.00	$ 210,000.00			
Alternate No. 1 - Fluted Column Tank:	**$ 2,606,000.00**	**NO BID**	**No BID**	**NO BID**	**NO BID**
Deduct to Delay Substantial Completion until May 2006	$ 216,000.00				
Alternate No. 2 - Composite Tank:	**$ 2,202,000.00**	**NO BID**	**$2,242,000.00**	**$ 2,496,000.00**	**$2,240,000.00**
Deduct to Delay Substantial Completion until May 2006	$ 216,000.00		$ 62,000.00	$ 210,000.00	$ 120,000.00
Lowest Tank Bid Per Company	**$ 2,202,000.00**	**$ 2,400,000.00**	**$2,242,000.00**	**$ 2,496,000.00**	**$2,240,000.00**

Notes:
Shaded Numbers in ***Italics*** indicate corrected amount.
(1) Bidder submitted bid bond for 5% of Amount Bid.
(2) Bidder acknowledge receipt of all Addendums

Memo

To: Nick Rowe

From: Linda Bridwell

Date: July 2, 2004

RE: Critical Issues for Network/Engineering

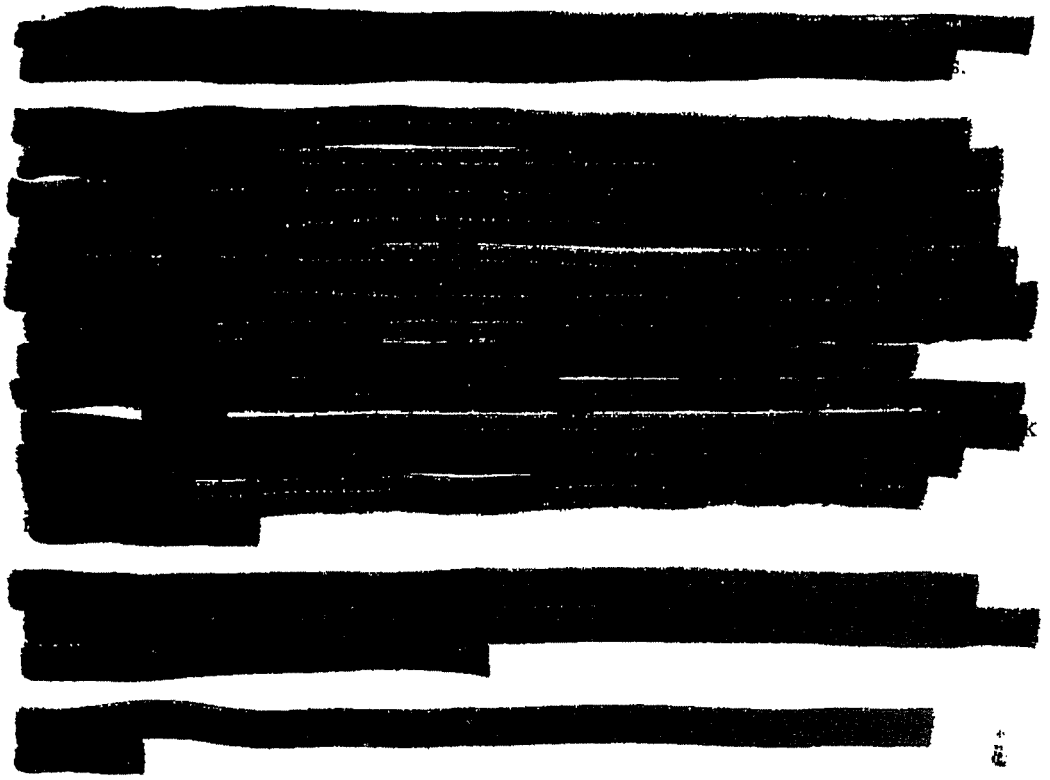
[redacted]

-Distribution Storage

[redacted]

Second is the ongoing need for the construction and operation of distribution storage. The second Clays Mill tank will be in service this month, the Russell Cave tank has been submitted for a Certificate, and we have the 2.0 MG Elevated storage tank under design. The ball valves have been replaced, and currently all storage is operational. We cannot afford to divert any of the redsources going into these construction projects and beyond. It is critical to reliability, meeting peak demands, and security of the system.

[redacted]



C: Stan Stockton

Linda Bridwell
11/25/2003 03:02 PM

To: Kendall Mitzner/WVAWC/AWWSC@AWW
cc:
Subject:

Proposed revisions.x

Budget Item	Description					
01-02	Clays Mill Ground Storage Tank - 3.0 MG	882200	185550	Expenditures to be made in 2003 due to late year fair weather allowing aggressive construction	Increased demands in growing area of system requires tank to go on line as scheduled	Unable to meet PSC Order requiring storage by 2005
01-05	Russell Cave Road Tank - 1.0 MG	850000	150000	Construction expenditures deferred until 2005	Needed for peak demands in growing area of system, new wholesale customer, and allows maintenance of tank serving largest customer that was constructed in 1989 with no subsequent maintenance.	Unable to meet PSC Order requiring storage by 2005 and unable to provide water to new wholesale customer
03-01	Elevated Storage Tank - 2.0 MG	2000000	900000	Project costs deferred until 2005	Project required to meet peak system demands and provide critical reliability	Unable to meet PSC Order requiring storage by 2005 and unable to provide water to new wholesale customer

Linda Bridwell
02/25/2003 02:35 PM

To: Kendall Mitzner/WVAWC/AWWSC@AWW
cc:
Subject: [redacted]

Kendall,
Hope this is what you're looking fo[redacted]

[redacted]

The Briar Hill tank and booster were completed, which is one of five tanks Kentucky-American is required to complete before 2005 by the Kentucky PSC. Kentucky-American had already completed the first tank at Clays Mill Road, and has two other tanks designed with construction ready to begin late this year and early 2004. The fifth tank will be designed in early 2004 and constructed in 2005.

[redacted]

Kentucky-American Water Company

1025 Laurel Oak Road • P.O. Box 1770 • Voorhees, New Jersey 08043 • (609) 346-8200

November 25, 2002
Proposed IP 03-01

KENTUCKY-AMERICAN WATER COMPANY
PROPOSED DESIGN INVESTMENT PROJECT 03-01
TWO MILLION GALLON ELEVATED STORAGE FACILITY

Reference: 1992 Least/Comprehensive Planning Study, Project B-13; 1993 and 2002 Storage Capacity Analyses, Strategic Business Plans 1997, 1998, 1999, 2000

SUBJECT

The need to equalize pressures, enhance fire flows and system reliability, and comply with Public Service Commission distribution storage requirements.

RECOMMENDATION

A two (2) million gallon elevated storage tank should be designed and constructed in the eastern Fayette County section of the distribution system to provide fire flows and system reliability, and to equalize demands within the system.

ESTIMATED COST

Total Estimated Cost	$410,000
Proposed 2003 Expenditure	$150,000
Previous 2004 Expenditure	$260,000

ADEQUACY

The proposed investment project will be adequate for land acquisition, design, permitting and bidding for the proposed tank. Construction funds will be requested in a future revision to this Investment Project.

INVESTMENT PROJECT REVIEW

DEPARTMENT	BY	DATE
ENGINEERING	John S. Young	12-3-02
WATER QUALITY	N/A	
INFO. SYSTEMS		
OTHERS		

RECOMMENDED FOR APPROVAL: 12/9/02
PRESIDENT

DISCUSSION

On August 15, 2002, Kentucky-American Water Company pumped a record amount of water into its Lexington area distribution system. That day, a total of 71.82 MGD was pumped from its treatment plants. The previous maximum day of record was 66.37 MGD in 2000. More critical, however, was the power outage at the Kentucky River Station treatment plant on July 31, 2002 during peak demands. Pressure dropped throughout the main system in less than five minutes. Pressure remained low in some areas for 30 minutes while the tanks were activated and the Richmond Road Station pumping facilities were increased.

Kentucky-American Water Company has 12 storage facilities in its distribution system, with a total volume of 16.84 MG. These storage facilities are used to provide fire protection and equalize pressures during high demand periods. Ten of the tanks are pumped storage facilities.

Kentucky-American Water Company had previously received approval to operate with storage volume below one average day demand that is required by Kentucky regulations. As part of this deviation from the requirement, Kentucky-American Water Company proposed to construct five additional tanks between 1993 and 2005. The Public Service Commission had approved this schedule. Two of the tanks have been completed and are operational; two are designed and will be constructed in 2003-2004. The fifth was originally proposed as a 3.0 million gallon pumped storage facility in the 1993 Storage Analysis.

Kentucky-American Water Company has worked diligently to determine the appropriate level of storage that is cost effective and meets the objectives of health, safety and reliability for its customers. In previous analysis, it was determined that reliability would be provided through storage and standby power capabilities at the treatment plants. The recent power outage during peak demands demonstrated that immediate and short-term reliability cannot be met with the existing operational capabilities. Although existing storage and standby power capabilities were sufficient to provide reliability until the power was restored, it took a brief period of time to activate both. Because demands were so high during that brief period, system pressure was lost before the tanks and diesel capabilities could be implemented.

Kentucky-American has reviewed alternatives to improve the ability to implement those capabilities, which are being proposed in another Investment Project. However, it was determined that the most cost effective and reliable method to assure sustained system pressure during peak demands is with additional elevated storage. It is proposed that this elevated storage tank be built at this time instead of the additional pumped storage originally specified in the 1993 Storage Analysis. Kentucky-American in conjunction with System Engineering has recently updated the 1993 Storage Analysis and recommends that an additional 3.0 million gallon pumped storage facility be constructed between 2005 and 2010.

The proposed tank will be located along the Winchester Road corridor near Strader Drive, which is one of the highest points in the system. It will be centrally located, which will help sustain pressure throughout the system. Recent construction in the area has increased demands, which has resulted in increased low-pressure complaints in the area. By constructing the tank in this area, it

will not only meet the system-wide reliability needs but also address the area low-pressure incidents that frequently occur. During the July 31 incident, this area experienced no water pressure for nearly thirty minutes.

Land acquisition costs are likely to be higher than usual because the proposed site is in an urban area. Additional SCADA logic will be required to ensure adequate operations of the tank for sustained water quality during moderate demand periods.

It is absolutely critical that design begin in 2003 so that adequate time is available for land acquisition and construction throughout 2004-2005. Kentucky-American is currently under an order from the Public Service Commission to complete the five proposed tanks by December 31, 2005. Following the July 31 incident, Commission staff have indicated that they are extremely concerned that Kentucky-American does not currently have adequate elevated storage for reliability purposes. It is recommended that this proposed elevated storage project be filed with the Public Service Commission before the end of 2002.

The estimated cost for the full project, including construction, is $3 million. Construction funds will be requested in a future Investment Project memorandum. The cost estimate is based on recent similar tank design and construction and will vary based upon contractor prices and land acquisition costs. This estimate is projected to be accurate within plus 10 to minus 25 percent.

Linda C. Bridwell, P.E.
Director – Engineering

Nick O. Rowe
Vice President – Operations

NOR/lcb

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL INVESTMENT PLAN PROJECT 03-01

2 MG ELEVATED STORAGE TANK

ITEM		TOTAL ESTIMATED COST
Preliminary Engineering		$ 12,000
Detailed Design, Bidding & Award		$ 102,320
Permits		$ 25,000
Utility Plant Construction		
Acct #303 Land & Land Rights		$ 250,000
Engineering Overhead (+/- 2%)		$ 7,410
Subtotal		$ 396,730
AFUDC		$ 13,270
Total		$ 410,000

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL INVESTMENT PLAN PROJECT 03- a1

2 MG ELEVATED STORAGE TANK

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	2003												TOTAL 2001
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Preliminary Design	KAWC / Consultant					$ 2,000	$ 5,000	$ 5,000						$ 12,000
Final Design	Consultant							$ 10,610	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 15,000	$ 125,610
Const. Admin. / Inspection	KAWC / Consultant													
Materials	KAWC													
Construction	Contractor													
Misc. Company Labor	KAWC													$ -
SUB-TOTAL		$ -	$ -	$ -	$ -	$ 2,000	$ 5,000	$ 15,610	$ 25,000	$ 25,000	$ 25,000	$ 25,000	$ 15,000	$ 137,610
O&C (+/- 5%)		$ -	$ -	$ -	$ -	$ 100	$ 250	$ 780	$ 1,250	$ 1,250	$ 1,250	$ 1,250	$ 750	$ 6,880
Overhead (+/- 2%)		$ -	$ -	$ -	$ -	$ 40	$ 100	$ 310	$ 500	$ 500	$ 500	$ 500	$ 300	$ 2,750
AFUDC		-	-	-	-	10	30	90	220	380	530	690	810	$ 2,760
CASH FORECAST		$ -	$ -	$ -	$ -	$ 2,150	$ 5,380	$ 16,790	$ 26,970	$ 27,130	$ 27,280	$ 27,440	$ 16,860	$ 150,000

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL INVESTMENT PLAN PROJECT 03-01

2 MG ELEVATED STORAGE TANK

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	2003 Carryover	2004												TOTAL 2004
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Preliminary Design	KAWC / Consultant	$ 12,000													$ -
Final Design	Consultant	$ 125,510	$ 25,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000								$ 85,000
Const. Admin. / Inspection	KAWC / Consultant	$ -									500	1000	1000	1000	$ 3,500
Materials	KAWC	$ -									30000	30000	30000	30000	$ 120,000
Construction	Contractor	$ -									20000	45000	50000	50000	$ 165,000
Land Acquisition	KAWC	$ -				$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000					$ 250,000
SUB-TOTAL		$ 137,510	$ 25,000	$ 15,000	$ 15,000	$ 65,000	$ 65,000	$ 50,000	$ 50,000	$ 50,000	$ 50,500	$ 76,000	$ 81,000	$ 81,000	$ 623,500
O&C (+/- 5%)		$ 6,880	$ 1,250	$ 750	$ 750	$ 3,250	$ 3,250	$ 2,500	$ 2,500	$ 2,500	$ 2,530	$ 3,800	$ 4,050	$ 4,050	$ 31,180
Overhead (+/- 2%)		$ 2,750	$ 500	$ 300	$ 300	$ 1,300	$ 1,300	$ 1,000	$ 1,000	$ 1,000	$ 1,010	$ 1,520	$ 1,620	$ 1,620	$ 12,470
AFUDC		$ 2,760	940	1,060	1,160	1,410	1,810	2,170	2,490	2,800	3,110	3,510	4,000	4,500	$ 28,960
CASH FORECAST		$ 150,000	$ 27,690	$ 17,110	$ 17,210	$ 70,960	$ 71,360	$ 55,670	$ 55,990	$ 56,300	$ 57,150	$ 84,830	$ 90,670	$ 91,170	$ 696,110

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL INVESTMENT PLAN PROJECT 03- 01

2 MG ELEVATED STORAGE TANK

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	Prior Carryover	2005												TOTAL 2005
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Preliminary Design	KAWC / Consultant	$ 12,000													$ -
Final Design	Consultant	$ 210,610													$ -
Const. Admin. / Inspection	KAWC / Consultant	$ 3,500	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,060	$ 60,060
Materials	KAWC	$ 120,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 30,000	$ 360,000
Construction	Contractor	$ 165,000	$ 50,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 100,000	$ 300,000	$ 200,000	$ 123,000	$ 100,000	$ 100,000	$ 100,000	$ 1,473,000
Land Acquisition	KAWC	$ 250,000													$ -
SUB-TOTAL		$ 761,110	$ 85,000	$ 135,000	$ 135,000	$ 135,000	$ 135,000	$ 135,000	$ 335,000	$ 235,000	$ 158,000	$ 135,000	$ 135,000	$ 135,060	$ 1,893,060
O&C (+/- 5%)		$ 38,060	$ 4,250	$ 6,750	$ 6,750	$ 6,750	$ 6,750	$ 6,750	$ 16,750	$ 11,750	$ 7,900	$ 6,750	$ 6,750	$ 6,750	$ 94,650
Overhead (+/- 2%)		$ 15,220	$ 1,700	$ 2,700	$ 2,700	$ 2,700	$ 2,700	$ 2,700	$ 6,700	$ 4,700	$ 3,160	$ 2,700	$ 2,700	$ 2,700	$ 37,860
AFUDC		$ 31,720	5,020	5,710	6,550	7,400	8,240	9,090	10,550	12,340	13,560	14,480	15,320	16,170	$ 124,430
CASH FORECAST		$ 848,110	$ 95,970	$ 150,160	$ 151,000	$ 151,850	$ 152,690	$ 153,540	$ 369,000	$ 263,790	$ 182,620	$ 158,930	$ 159,770	$ 160,680	$ 2,150,000

KENTUCKY-AMERICAN WATER COMPANY
ECONOMIC ANALYSIS OF THE IMPACT OF CAPITAL
SPENDING PROPOSAL
2 MG ELEVATED STORAGE TANK

Determination of Revenue Requirement		
Authorized Rate of Return on Common Equity		11.00%
Federal Income Tax Rate		35.00%
Return on Common Equity before FIT		16.92%
State Income Tax Rate		8.25%
Required Rate of Return on CE for Project		18.44%
Common Equity Ratio for Project		40.00%
Weighted Cost of Common Equity before Tax		7.38%
Long Term Debt Ratio for Project		60.00%
Estimated Cost Rate for New Debt		8.00%
Weighted Cost of Debt		4.80%
Total Pre-Tax Cost of Capital		12.18%
Total Estimated Cost of Project		$ 3,000,000
Investment by Others		0
Net Investment Financed by Company		$ 3,000,000
New Common Equity	$ 1,200,000	
New Long Term Debt	1,800,000	

Total Revenue Requirement		Amount	Rate
Required Pre-Tax Operating Income		$ 365,400	12.18%
Depreciation Rate	1.180%	35,400	1.18%
Property Tax Rate	0.7037%	21,111	0.70%
Change in Operation & Maint. Expense		0	0.00%
Revenue from New Customers		0	0.00%
Total Net Revenue Requirement		$ 421,911	14.06%
Revenue Tax Rate	0.14537%	614	0.02%
Total Revenue Requirement		$ 422,525	14.08%
Latest 12 Months Revenue - 09/30/2002		$ 42,262,154	
Required Price Increase		1.00%	

Kentucky-American Water Company

2300 Richmond Road • Lexington, Kentucky 40502 • (859) 269-2386 • Fax (859) 268-6327

September 21, 2001
Revised IP 01-02
Project No. 11106

KENTUCKY-AMERICAN WATER COMPANY
REVISED CAPITAL INVESTMENT PROJECT 01-02
CLAYS MILL 3 MG GROUND STORAGE TANK

Reference: Investment Project Memorandum dated September 5, 2000, Strategic Business Plans for 1999 and 2000

ESTIMATED COST

Previous Estimated Cost	$ 100,000
Previous 2001 Expenditure	$ 100,000
Revised Estimated Cost	$1,500,000
Revised Prior Expenditure	$ 100,000
Proposed 2002 Expenditure	$ 100,000
Proposed 2003 Expenditure	$1,300,000

It is recommended that the budget be revised to include construction funding. The original authorized expenditures were for design only. The purpose of the project is to equalize demand during peak periods, provide fire flows, and improve system reliability within the distribution network.

INVESTMENT PROJECT REVIEW

DEPARTMENT	BY	DATE
ENGINEERING		10-10-01
WATER QUALITY	N/A	
INFO. SYSTEMS		
OTHERS		
RECOMMENDED FOR APPROVAL: PRESIDENT		10-15-01

DISCUSSION

On June 13, 2000, Kentucky-American Water Company pumped a record amount of water into its Lexington area distribution system. That day, a total of 66.37 MGD was pumped from its treatment plants. The previous maximum day of record was 64.67 MGD in 1998. Additionally, the maximum hourly pumpage rate on that day was 107 MGD, an increase of approximately 12 MGD over the previous maximum hour event that took place in 1998. A tank crucial to one of KAWC's largest customers was critically low for several hours this day, thus fire protection for this area was low and other tanks were at minimum volume levels. Finally, all available pumps were operating, including all tanks and the pumps at both plants which were operating at full rated capacity.

Kentucky-American Water Company has twelve storage facilities in its distribution system with a total volume of 16.84 MG. These storage facilities are used to provide fire protection and equalize pressures during high demand periods. Reliability is provided through storage and diesel capabilities at the treatment plants. Kentucky-American has worked with the Kentucky Public Service Commission to determine an appropriate level of storage that is cost effective and meets the objectives of health, safety and reliability for its customers. Because of this continued dialogue with the Commission staff, Kentucky-American has received approval to operate with storage below the volume equal to one average day that is required by Kentucky regulations. However, based on the operations during the latest peak day event and continued growth within the system, it is imperative that Kentucky-American increase its storage capacity in order to continue to provide fire protection and reliability to its distribution system.

Since the maximum day of record, KAWC has added several new demands to its existing system. These system demands include sale for resale to Harrison County Water Association for 100,000 gpd, connecting 1100 customers in Clark County for 350,000 gpd, increased sale for resale to North Middletown of 100,000 gpd, and approximately 3000 new customers. The proposed tank is critical to meeting system reliability and is the most efficient way to meet peak period demands, provide fire protection and allow for continued growth. The tank will be located on property in south Lexington that is an existing tank site to minimize construction costs. This will allow Kentucky-American to utilize existing piping to the site and expand the existing pumping on-site capabilities. This existing tank site is located in the middle of a high growth area and is an excellent location to optimize the use of the additional facilities.

Design is scheduled for completion in 2001, with minor construction activities to begin in 2002 and completion in 2003. The cost estimate was based on the design engineer's estimate and will vary based upon contractor installation prices. This estimate is projected to be accurate within plus ten to minus twenty-five percent.

Richard C. Svindland, P.E.
Senior Operations Engineer

Nick O. Rowe
Vice President – Operations

NOR/rcs

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL INVESTMENT PLAN PROJECT 01-02

CLAYS MILL 3 MG GROUND STORAGE TANK

ITEM	RESPONSIBLE ENTITY	TOTAL ESTIMATED COST
Preliminary Design	KAWC / Consultant	$ 15,000
Final Design	Consultant	$ 75,000
Construction Admin. / Inspection	KAWC / Consultant	$ 50,000
Materials	KAWC	$ 150,000
Construction	Contractor	$ 1,030,480
Misc. Company Labor	KAWC	$ 4,520
	Sub-Total	$ 1,325,000
O&C (+/- 5%)		$ 64,380
Engineering Overhead (+/- 2%)		$ 26,540
	Sub-Total	$ 1,415,920
AFUDC		$ 79,180
	Total	$ **1,495,100**
	Estimate	$ **1,500,000**

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL INVESTMENT PLAN PROJECT 01-02

CLAYS MILL 3 MG GROUND STORAGE TANK

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	2001 Carryover	2002 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL 2002
Preliminary Design	KAWC / Consultant	$ 15,000													$ -
Final Design	Consultant	$ 75,000													$ -
Const. Admin. / Inspection	KAWC / Consultant	$ -													$ 5,000
Materials	KAWC	$ -													$ 40,000
Construction	Contractor	$ -													$ 37,000
SUB-TOTAL		$ 94,520	$ -	$ 250	$ 250	$ 2,500	$ 77,250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 250	$ 82,000
		$ -													
O&C (+/- 5%)		$ 2,840	$ -	$ 10	$ 10	$ 130	$ 3,860	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10	$ 4,080
		$ -													
Overhead (+/- 2%)		$ 1,890	$ -	$ 10	$ 10	$ 50	$ 1,550	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10	$ 10	$ 1,690
		$ -													
AFUDC		$ 750	590	590	590	620	1,330	1,090	1,100	1,100	1,100	1,100	1,100	1,100	$ 11,410
CASH FORECAST		$ 100,000	$ 590	$ 860	$ 860	$ 3,300	$ 83,990	$ 1,360	$ 1,370	$ 1,370	$ 1,370	$ 1,370	$ 1,370	$ 1,370	$ 99,180

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL INVESTMENT PLAN PROJECT 01-02

CLAYS MILL 3 MG GROUND STORAGE TANK

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	2001 & 02 Carryover	2003												TOTAL 2003
			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
Preliminary Design	KAWC / Consultant	$ 15,000													$ -
Final Design	Consultant	$ 75,000													$ -
Const. Admin. / Inspection	KAWC / Consultant	$ 5,000													$ 45,000
Materials	KAWC	$ 40,000													$ 110,000
Construction	Contractor	$ 37,000													$ 993,480
Misc. Company Labor	KAWC	$ 4,520													$ -
SUB-TOTAL		$ 176,520	$ 156,540	$ 126,540	$ 86,540	$ 86,540	$ 86,540	$ 86,540	$ 86,540	$ 86,540	$ 86,540	$ 86,540	$ 86,540	$ 86,540	$1,148,480
O&C (+/- 5%)		$ 6,920	$ 7,830	$ 6,330	$ 4,330	$ 4,330	$ 4,330	$ 4,330	$ 4,330	$ 4,330	$ 4,330	$ 4,330	$ 4,330	$ 4,330	$ 57,460
Overhead (+/- 2%)		$ 3,580	$ 3,130	$ 2,530	$ 1,730	$ 1,730	$ 1,730	$ 1,730	$ 1,730	$ 1,730	$ 1,730	$ 1,730	$ 1,730	$ 1,730	$ 22,960
AFUDC		$ 12,160	2,570	3,270	3,680	4,220	4,770	5,310	5,850	6,390	6,930	7,470	8,010	8,550	$ 67,020
CASH FORECAST		$ 199,180	$ 170,070	$ 138,670	$ 96,280	$ 96,820	$ 97,370	$ 97,910	$ 98,450	$ 98,990	$ 99,530	$ 100,070	$ 100,610	$ 101,150	$1,295,920

KENTUCKY-AMERICAN WATER COMPANY
ECONOMIC ANALYSIS OF THE IMPACT OF CAPITAL
SPENDING PROPOSAL
CLAYS MILL 3 MG GROUND STORAGE TANK

Determination of Revenue Requirement		
Authorized Rate of Return on Common Equity		11.00%
Federal Income Tax Rate		35.00%
Return on Common Equity before FIT		16.92%
State Income Tax Rate		8.25%
Required Rate of Return on CE for Project		18.44%
Common Equity Ratio for Project		40.00%
Weighted Cost of Common Equity before Tax		7.38%
Long Term Debt Ratio for Project		60.00%
Estimated Cost Rate for New Debt		8.00%
Weighted Cost of Debt		4.80%
Total Pre-Tax Cost of Capital		12.18%
Total Estimated Cost of Project		$ 1,500,000
Investment by Others		0
Net Investment Financed by Company		$ 1,500,000
New Common Equity	$ 600,000	
New Long Term Debt	900,000	

Total Revenue Requirement		Amount	Rate
Required Pre-Tax Operating Income		$ 182,700	12.18%
Depreciation Rate	1.180%	17,700	1.18%
Property Tax Rate	0.7037%	10,556	0.70%
Change in Operation & Maint. Expense		0	0.00%
Revenue from New Customers		0	0.00%
Total Net Revenue Requirement		$ 210,956	14.06%
Revenue Tax Rate	0.14537%	307	0.02%
Total Revenue Requirement		$ 211,263	14.08%
Latest 12 Months Revenue - 06/30/2001		$ 40,071,359	
Required Price Increase			0.53%

Approved at
Board of Directors Meeting
October 11, 2000

Kentucky-American Water Company

1025 Laurel Oak Road • P.O. Box 1770 • Voorhees, New Jersey 08043 • (609) 346-8200

September 5, 2000
Proposed IP 01- 02
Project No. 11106

KENTUCKY-AMERICAN WATER COMPANY
PROPOSED DESIGN INVESTMENT PROJECT 01-
THREE MILLION GALLON GROUND STORAGE TANK

Reference: 1992 Least/Comprehensive Planning Study, Project B-13; 1993 and 2000 Storage Capacity Analyses, Strategic Business Plans for 1999 and 2000

SUBJECT OF STUDY

The need to equalize pressures and provide fire flows and system reliability through finished water storage located in the distribution system.

RECOMMENDATION

A 3.0 million gallon ground storage tank should be designed and constructed in the distribution system to provide fire flows and system reliability and to equalize demands within the system. This facility should be located on the site of existing storage to reduce costs.

ESTIMATED COST

Total Estimated Cost	$ 100,000
Proposed 2001 Expenditure	$ 100,000

ADEQUACY

The proposed investment project is adequate for engineering design, survey, and bidding services to properly locate the new tank. A revision to the current project will be made after construction bids are received.

INVESTMENT PROJECT REVIEW

DEPARTMENT	BY	DATE
ENGINEERING	[signature]	9.21.00
WATER QUALITY	N/A	
INFO. SYSTEMS		
OTHERS		

RECOMMENDED FOR APPROVAL: [signature] 9/25/00
PRESIDENT

DISCUSSION

This capital investment will initiate design services for the new three (3) MG tank. Using current and projected system demands, the IRP to be completed in late 2000 will determine which existing site (Hume Road, Clays Mill or Parkers Mill) will be most effective in having additional storage added to the site. The tank will be a ground storage facility, and will share the pump station with the existing tank on the site. Based on recent system operations, including the new record maximum day pumpage, it is obvious that this tank is necessary. Peak system demands in the northwestern and western sections of the distribution system caused low pressure for numerous residential and commercial customers. The continued residential growth in this area will only increase system demands during hot and dry weather. This additional tank is critical to meeting system reliability and is the most efficient way to meet peak period demands while providing fire protection. Design will also include dechlorination facilities on site to allow for dechlorination while the tank is drained for maintenance.

The Kentucky Public Service Commission Title 807, Chapter 5 - Utilities, Section 4 - Continuity of Service, paragraph (4) states "the minimum storage capacity for systems shall be equal to the average daily consumption." KAWC does not currently meet this requirement. The 1992 Least/Comprehensive Planning Study and the 1993 Storage Capacity Analysis outlined the need for three additional three (3) MG tanks in the main service area and two additional tanks in the north high service area. The 1993 Storage Capacity Analysis proposed the use of a 50-50 spilt between storage capacity and back-up power facilities. Kentucky-American would be able to provide one-half average daily consumption in storage and be able to produce and pump one-half average daily consumption using backup or auxiliary power at the treatment facilities. In 1993 the Public Service Commission approved the Storage Capacity Analysis and granted a variance to KAWC until 2005. Two of the five necessary tanks have already been constructed with the completion of the three (3) MG Clays Mill ground storage tank and the 750,000 gallon elevated Briar Hill Road tank. In 2000, KAWC initiated discussions with the PSC to explore a further variance of storage needs, however, it is clear from system operations that this tank is necessary. Those discussions are still ongoing for future storage needs.

Design is scheduled for 2001, with construction to begin in 2002 and completion in 2003. A revision to the current proposed investment project will be presented once design is complete and construction costs can be accurately projected. It is estimated that construction will cost $1,400,000. The proposed design cost is within an accuracy of plus or minus 10 percent.

Richard C. Svindland
Operations Engineer

Nick O. Rowe
Vice President – Operations

NOR/rcs

KENTUCKY-AMERICAN WATER COMPANY

PROPOSED 2001 CAPITAL INVESTMENT PLAN PROJECT 01-

THREE (3) MG GROUND STORAGE TANK

ITEM	RESPONSIBLE ENTITY	TOTAL ESTIMATED COST
Preliminary Design	KAWC / Consultant	$ 15,000
Final Design	Consultant	$ 75,000
Company Labor	KAWC	$ 4,529
	Sub-Total	$ 94,529
O&C (3%)		$ 2,836
Engineering Overhead (2%)		$ 1,891
	Sub-Total	$ 99,255
AFUDC		$ 744
	Total	**$ 100,000**

KENTUCKY-AMERICAN WATER COMPANY

PROPOSED 2001 CAPITAL INVESTMENT PLAN PROJECT 01-

THREE (3) MG GROUND STORAGE TANK

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	2001												TOTAL 2001
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	
Preliminary Design	KAWC / Consultant			$ 5,000	$ 5,000	$ 5,000								$ 15,000
Final Design	Consultant					$ 25,000	$ 25,000	$ 25,000						$ 75,000
Company Labor	KAWC						$ 2,029	$ 2,500						$ 4,529
SUB-TOTAL				$ 5,000	$ 5,000	$ 30,000	$ 27,029	$ 27,500	$ -					$ 94,529
O&C (3%)				$ 150	$ 150	$ 900	$ 811	$ 825	$ -					$ 2,836
Overhead (2%)				$ 100	$ 100	$ 600	$ 541	$ 550	$ -					$ 1,891
AFUDC				39.38	39.38	236.25	212.85	216.56	-					$ 744
CASH FORECAST				$ 5,289	$ 5,289	$ 31,736	$ 28,593	$ 29,092	$ -					$ 100,000

KENTUCKY-AMERICAN WATER COMPANY
ECONOMIC ANALYSIS OF THE IMPACT OF CAPITAL
SPENDING PROPOSAL
THREE (3) MG GROUND STORAGE TANK

Determination of Revenue Requirement				
Authorized Rate of Return on Common Equity				11.00%
Federal Income Tax Rate				35.00%
Return on Common Equity before FIT				16.92%
State Income Tax Rate				8.25%
Required Rate of Return on CE for Project				18.44%
Common Equity Ratio for Project				40.00%
Weighted Cost of Common Equity before Tax				7.38%
Long Term Debt Ratio for Project				60.00%
Estimated Cost Rate for New Debt				7.00%
Weighted Cost of Debt				4.20%
Total Pre-Tax Cost of Capital				11.58%
Total Estimated Cost of Project				$ 1,500,000
Investment by Others				0
Net Investment Financed by Company				$ 1,500,000
New Common Equity	$	600,000		
New Long Term Debt		900,000		
Total Revenue Requirement			Amount	Rate
Required Pre-Tax Operating Income			$ 173,700	11.58%
Depreciation Rate		2.200%	33,000	2.20%
Property Tax Rate		0.7037%	10,556	0.70%
Change in Operation & Maint. Expense			0	0.00%
Revenue from New Customers			0	0.00%
Total Net Revenue Requirement			$ 217,256	14.48%
Revenue Tax Rate		0.14537%	316	0.02%
Total Revenue Requirement			$ 217,572	14.50%
Latest 12 Months Revenue - 06/30/2000			$ 39,128,658	
Required Price Increase			0.56%	

Approved at
Board of Directors Meeting
October 11, 2000

Kentucky-American Water Company

1025 Laurel Oak Road • P.O. Box 1770 • Voorhees, New Jersey 08043 • (609) 346-8200

September 5, 2000
Proposed IP 01-05
Project No. 11201

KENTUCKY-AMERICAN WATER COMPANY
PROPOSED DESIGN INVESTMENT PROJECT 01-
ONE MILLION GALLON PUMPED STORAGE FACILITY

Reference: 1992 Least/Comprehensive Planning Study, Project B-8; 1993 and 2000 Storage Capacity Analyses, Strategic Business Plans 1997, 1998, 1999, 2000

SUBJECT

The need to equalize pressures, provide fire flows, and improve system reliability through finished water storage located in the north section of the distribution system.

RECOMMENDATION

A one (1) million gallon pumped storage tank should be designed and constructed in the northern Fayette County section of the distribution system to provide fire flows and system reliability, and to equalize demands within the system.

ESTIMATED COST

Total Estimated Cost	$ 200,000
Proposed 2001 Expenditure	$ 150,000
Proposed 2002 Expenditure	$ 50,000

ADEQUACY

The proposed investment project funds are adequate for engineering design, survey, and land acquisition and bidding services to properly locate the new tank.

INVESTMENT PROJECT REVIEW

DEPARTMENT	BY	DATE
ENGINEERING	John J. Young Jr.	8-21-00
WATER QUALITY	N/A	
INFO. SYSTEMS		
OTHERS		

RECOMMENDED FOR APPROVAL: 9/25/00
PRESIDENT

DISCUSSION

This capital investment will initiate design services for the new one (1) MG tank to be located on a new site in the northern section of the distribution system as recommended in the 1992 Least Cost/Comprehensive Planning Study. Part of that task will be to negotiate land acquisition. This tank is critical to the continued operations and reliability in the rapidly growing Scott County area. On peak demand days, many high elevation areas in Scott County experience low pressure. It is anticipated that this tank will provide better reliability for Toyota Motor Manufacturing and will reinforce the area where new bulk sales will be provided to the Harrison County Water Association. The tank will also allow for the Muddy Ford tank to be taken out of service for maintenance. The Muddy Ford tank, which was built in 1989, is currently so critical to Scott County and Toyota operations that it could not be painted without shutting down Toyota. A recent inspection projected the life of the paint on the tank to be an additional five years. In that time frame, additional storage for the area must be available. Design will also include dechlorination facilities on site to allow for disinfection and adequate treatment during tank draining.

The Kentucky Public Service Commission Title 807, Chapter 5 - Utilities, Section 4 - Continuity of Service, paragraph (4) states "the minimum storage capacity for systems shall be equal to the average daily consumption." KAWC does not currently meet this requirement. The 1992 Least/Comprehensive Planning Study and the 1993 Storage Capacity Analysis outlined the need for an additional three (3) MG tank in the main service area and two additional tanks in the north high service area. The 1993 Storage Capacity Analysis proposed the use of a 50-50 spilt between storage capacity and back-up power facilities. In 1993 the Public Service Commission approved the Storage Capacity Analysis and granted a variance to KAWC until 2005. Two of the five necessary tanks have already been constructed with the completion of the three (3) million gallon Clays Mill ground storage tank and the 750,000 gallon elevated Briar Hill Road tank. In 2000, KAWC initiated discussion with the PSC to explore the possibility of a further variance, however, it is clear from operational history that this proposed tank is absolutely necessary. The discussions with the PSC are ongoing with regard to future storage needs.

Design will be complete in 2002, and construction will begin in 2003 with completion in 2004. It is estimated that construction will cost $1,300,000 including pumping facilities. The accuracy of this estimate is plus/minus 15 percent.

Kevin W. Kennoy
Operations Engineer

Nick O. Rowe
Vice President -- Operations

NOR/kwk

KENTUCKY-AMERICAN WATER COMPANY
PROPSOED DESIGN INVESTMENT PLAN PROJECT 01-
ONE MILLION GALLON PUMPED STORAGE FACILITY

Detailed Cost Estimate

Item	Category	Estimate
Preliminary and Final Design	Contract	$75,000
Administration	Company	5,000
Surveying	Contract	4,000
Land Purchase and Legal Services	Company	96,200
		$180,200
O&C (5%)		9,010
Engineering Overhead (2%)		3,604
		$192,814
AFUDC		6,722
		$199,536
SAY		$200,000

/sdb
9/21/00
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KENTUCKY-AMERICAN WATER COMPANY

PROPOSED DESIGN INVESTMENT PLAN PROJECT 01-

Russell Cave Road Pumped Storage Facilities

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	2001												TOTAL 2001
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	
Design	Consultant													$ 65,000
Administration	KAWC													$ 5,000
Surveying	Consultant													$ 4,000
Land Purchase	KAWC											$ 2,200	$ 44,000	$ 46,200
Legal	Consultant													$ 15,000
SUB-TOTAL				$ 25,000	$ 11,000	$ 26,000	$ 26,000	$ 1,000	$ -	$ -	$ -	$ 2,200	$ 44,000	$ 135,200
O&C (5%)				$ 1,250	$ 550	$ 1,300	$ 1,300	$ 50	$ -	$ -	$ -	$ 110	$ 2,200	$ 6,760
Overhead (2%)				$ 500	$ 220	$ 520	$ 520	$ 20	$ -	$ -	$ -	$ 44	$ 880	$ 2,704
AFUDC				$ 94	$229	$368	$563	$664	$668	$888	$668	$676	$662	$ 5,256
CASH FORECAST				$ 26,844	$ 11,999	$ 28,188	$ 28,383	$ 1,734	$ 668	$ 668	$ 668	$ 3,030	$ 47,742	$ 149,920

KENTUCKY-AMERICAN WATER COMPANY

PROPOSED DESIGN INVESTMENT PLAN PROJECT 01-

Russell Cave Road Pumped Storage Facilities

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	2002												TOTAL 2002	Project Total
		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC		
Design	Consultant													$ 10,000	$ 75,000
Administration	KAWC													$ -	$ 5,000
Surveying	Consultant													$ -	$ 4,000
Land Purchase	KAWC											$ -	$ -	$ 35,000	$ 81,200
Legal	Consultant													$ -	$ 15,000
SUB-TOTAL				$ -	$ -	$ -	$ -	$ 10,000	$ 27,000	$ 2,000	$ 3,000	$ 3,000	$ -	$ 45,000	$ 180,200
O&C (5%)				$ -	$ -	$ -	$ -	$ 500	$ 1,350	$ 100	$ 150	$ 150	$ -	$ 2,250	$ 9,010
Overhead (2%)				$ -	$ -	$ -	$ -	$ 200	$ 540	$ 40	$ 60	$ 60	$ -	$ 900	$ 3,604
AFUDC				$ -	$0	$0	$0	$38	$176	$285	$304	$326	$338	$ 1,466	$ 6,722
CASH FORECAST				$ -	$ -	$ -	$ -	$ 10,738	$ 29,066	$ 2,425	$ 3,514	$ 3,536	$ 338	$ 49,616	$ 199,536

AFUDC Interest Rate 0.0075

KENTUCKY-AMERICAN WATER COMPANY
ECONOMIC ANALYSIS OF THE IMPACT OF CAPITAL
SPENDING PROPOSAL
Russell Cave Road Pumped Storage Facilities

Determination of Revenue Requirement			
Authorized Rate of Return on Common Equity			11.00%
Federal Income Tax Rate			35.00%
Return on Common Equity before FIT			16.92%
State Income Tax Rate			8.25%
Required Rate of Return on CE for Project			18.44%
Common Equity Ratio for Project			40.00%
Weighted Cost of Common Equity before Tax			7.38%
Long Term Debt Ratio for Project			60.00%
Estimated Cost Rate for New Debt			7.00%
Weighted Cost of Debt			4.20%
Total Pre-Tax Cost of Capital			11.58%
Total Estimated Cost of Project			$ 1,500,000
Investment by Others			0
Net Investment Financed by Company			$ 1,500,000
New Common Equity	$ 600,000		
New Long Term Debt	900,000		

Total Revenue Requirement		Amount	Rate
Required Pre-Tax Operating Income		$ 173,700	11.58%
Depreciation Rate	2.200%	33,000	2.20%
Property Tax Rate	0.7037%	10,556	0.70%
Change in Operation & Maint. Expense		0	0.00%
Revenue from New Customers		0	0.00%
Total Net Revenue Requirement		$ 217,256	14.48%
Revenue Tax Rate	0.14537%	316	0.02%
Total Revenue Requirement		$ 217,572	14.50%
Latest 12 Months Revenue - 06/30/2000		$ 39,128,658	
Required Price Increase		0.56%	

Kentucky-American Water Company

Finished Water Storage Meeting Outline

July 14, 2000

- Overview of KAWC system
  - o Physical facilities
  - o Demands
- Concepts of finished water storage
  - o Purposes served by finished water storage
  - o Water quality issues
- Regulations
  - o Kentucky
  - o Other states and other guidelines
- History
  - o Previous analysis and Commission order
  - o Improvements since previous analysis
- Current analysis
  - o Equalization
  - o Fire flow
  - o Reliability
    - -Loss of Jacobson Reservoir
    - -Loss of Kentucky River
    - -Loss of KRS
    - -Loss of RRS
    - -Power outage
  - o Localized hydraulic issues
  - o Condition of existing facilities
  - o Maintenance on existing facilities
- Discussion

Kentucky-American Water Company system overview

- 97,000 customers

- Two sources of supply
  - Kentucky River
  - Jacobson Reservoir
  - (Lake Ellerslie – emergency)

- Two treatment plants
  - Kentucky River Station (40 mgd)
  - Richmond Road Station (25 mgd)

- Three gradients
  - Main Service (90%)
  - High Service (9%)
  - Sadieville (1%)

- Distribution system
  - 1,431 miles of main
  - 5,939 hydrants
  - 12 finished water storage tanks (8 pumped storage; 4 floating)
    Total volume = 16.6 MG
    Effective volume = 15.3 MG
  - Clearwells at treatment plants = 4.02 MG

- Emergency power pumping capacity
  - Raw water = 19.4 mgd
  - Treatment plant delivery = 26.4 mgd
  - Main service tanks = 24 mgd
  - High service boosters = 7.7 mgd

Existing Storage and Pumping Facilities

Kentucky-American Water Company
Existing Storage and Pumping Facilities

Source

Intake	No. of Pumps	Total Pumping Capacity (MGD)	* Reliable Pump Capacity (MGD)	** Standby Pump Capacity (MGD)
Kentucky River	6	74.4	62.0	0.0
Jacobson Reservoir	3	22.8	9.4	13.4
Lake Ellerslie	2	10.0	4.0	6.0
Total	**11**	**107.2**	**75.4**	**19.4**

Treatment Plant Delivery

Plant	Clearwell Volume (MG)	Effective Clearwell 50% Volume (MG)	No. of Pumps	Total Pumping Capacity (MGD)	* Reliable Pump Capacity (MGD)	** Standby Pump Capacity (MGD)
KRS	2.97	1.48	6	51.6	41.7	9.9
RRS	1.05	0.52	6	37.0	27.0	16.5
Total	**4.02**	**2.00**	**12**	**88.6**	**68.7**	**26.4**

Main Service Gradient

Tank	Year Built	Effective Volume (MG)	Elevated	Overflow Elevation	No. of Pumps	Total Pumping Capacity (MGD)	* Reliable Pump Capacity (MGD)	** Standby Pump Capacity (MGD)
Clays Mill	1995	2.75	No	1022.50	2	18.00	9.00	9.00
Tates Creek	1954	0.30	Yes	1185.25	0	N/A	N/A	N/A
Parkers Mill	1968	2.78	No	1025.00	1	9.00	0.00	9.00
York Street	1949	0.91	No	1000.25	1	2.50	0.00	0.00
Cox Street Ground	1948	0.91	No	1001.75	1	2.50	0.00	0.00
Cox Street Elevated	1955	1.00	Yes	1117.00	1	3.00	0.00	0.00
Mercer Road	1965	2.00	Yes	1107.00	1	5.00	0.00	0.00
Hume Road	1988	2.75	No	979.50	3	9.00	6.00	6.00
Total		**13.40**			**10**	**49.00**	**15.00**	**24.00**

High Service Gradient (Remote Boosters)

Booster	No. of Pumps	Total Pumping Capacity (MGD)	* Reliable Pump Capacity (MGD)	** Standby Pump Capacity (MGD)
Briar Hill	2	4.00	2.00	0.00
Mt. Horeb	2	1.15	0.57	0.00
Newtown	3	7.70	4.70	7.70
Delaplain Road	1	0.85	0.00	0.00
Total	**8**	**13.70**	**7.27**	**7.70**

High Service Gradient (Tanks)

Tank	Year Built	Effective Volume (MG)	Elevated	Overflow Elevation	No. of Pumps	Total Pumping Capacity (MGD)	* Reliable Pump Capacity (MGD)	** Standby Pump Capacity (MGD)
Briar Hill	1998	0.75	Yes	1150.00	0	N/A	N/A	N/A
Muddy Ford	1989	0.75	Yes	1130.00	0	N/A	N/A	N/A
Hall	1962	0.20	No	1115.00	2	0.58	0.29	0.00
Total		**1.70**			**2**	**0.58**	**0.29**	**0.00**

Sadieville

Tank	Year Built	Effective Volume (MG)	Elevated	Overflow Elevation	No. of Pumps	Total Pumping Capacity (MGD)	* Reliable Pump Capacity (MGD)	** Standby Pump Capacity (MGD)
Sadieville	1975	0.20	Yes	1150.0	0	N/A	N/A	N/A
Total		**0.20**			**0**	**N/A**	**N/A**	**N/A**

Demands

System Demands (mgd)

Historic	Avg. Day	Max. Day
1986	35.74	57.47
1987	38.28	54.89
1988	36.71	63.91
1989	33.84	47.72
1990	34.59	58.52
1991	37.11	56.42
1992	36.63	47.22
1993	39.53	59.49
1994	40.55	58.36
1995	40.02	63.77
1996	41.03	53.70
1997	40.92	60.70
1998	42.26	64.67
1999	41.31	60.47
2000	N/A	66.37

Projected	Avg. Day	Max. Day
2005	42.33	75.85
2010	43.74	78.26
2015	44.54	79.46

Note: An additional 1 to 2 mgd of water is used for "in-plant" needs in addition to system delivery shown above.

Purposes served by finished water storage

Treated water storage in a water distribution system is provided for various purposes as quoted from the following sources:

1. Introduction to Water Distribution (Volume 3 of AWWA's Principles and Practices of Water Supply Operations)

   Chapter 8, Section 8-1, under the chapter heading "Purpose of Water Storage" states that "water storage in the distribution system is required for the following reasons:

   - Equalizing supply and demand
   - Increasing operating convenience
   - Leveling out pumping requirements
   - Providing water during source or pump failure
   - Providing water to meet fire demands
   - Providing surge relief
   - Increasing detention times
   - Blending water sources"

   Under the chapter heading "Capacity Requirements", it also states:

   "The capacity of distribution storage is based on the maximum water demands in different parts of the system. Capacity varies for different systems and can only be determined by qualified engineers after a careful analysis and study of a particular system. Storage capacity needed for fire protection should be based on the recommendation of fire underwriter's organizations.

   Additional storage capacity may be necessary to meet emergencies such as pump failure, source failure, or transmission-line break. The need for emergency storage should be based on the reliability of the supply and pumping equipment and the availability of backup equipment and standby power resources."

2. Recommended Standards for Water Works (Ten States Standards)

   Chapter 7, Finished Water Storage, states the following in chapter 7.0.1 "Sizing":

   "Storage facilities should have sufficient capacity, as determined from engineering studies, to meet domestic demand, and where fire protection is provided, fire flow demands.

   a. Fire flow requirements established by the appropriate state Insurance Services Office should be satisfied where fire protection is provided.
   b. The minimum storage capacity (or equivalent capacity) for systems not providing fire protection shall be equal to the average daily consumption. This requirement may be reduced when the source and treatment facilities have sufficient capacity with standby power to supplement peak demands of the system."

Water Quality Issues

Recommended Standards for Water Works (Ten State Standards) states that "excessive storage capacity should be avoided where water quality deterioration may occur." The specific water quality deterioration issues that can become a direct concern with additional storage in the KAWC system include maintenance of a disinfectant residual, increased disinfection by-product formation, and nitrification. Indirect water quality concerns may also arise due to the potential need to modify distributive pumping operations at the treatment plants.

Concerns

- The current maximum contaminant level (MCL) for THMs of 100 ug/L will be lowered to 80 ug/L per the Stage I Disinfectants/Disinfection By-Product (D/DBP) Rule, which becomes effective in December 2001. Haloacetic acids (HAAs) will become regulated in December 2001 with an MCL of 60 ug/L.

- The Interim Enhanced Surface Water Treatment Rule (IESWTR), which becomes effective in December 2001, will lower the finished water turbidity MCL from 0.5 NTU to 0.3 NTU in at least 95% of the measurements taken each month while at no time exceeding 1.0 NTU in any single sample. The ability to operate the treatment plants with minimal flow variations to avoid treatment upsets is critical in meeting this more stringent regulation.

- Nitrification has been controlled by closely monitoring the chlorine-ammonia ratio. Nitrification results when nitrifying bacteria (which are nonpathogenic) use ammonia-nitrogen as a food source and convert it to nitrite and ultimately nitrate.

Minimizing the detention time in the distribution system, by not adding storage above that which is required for daily operations and fire flows, is a critical factor in the ability to meet these regulations.

Regulations regarding storage

Kentucky regulations

The Kentucky Public Service Commission Title 807, Chapter 5 - Utilities, Section 4 - Continuity of Service, paragraph (4) states that "the minimum storage capacity for systems shall be equal to the average daily consumption." Section 4 is entitled "Continuity of Service" and generally deals with provisions to provide continuous supply to customers during various emergency situations. The "emergency" storage is generally required so that an adequate supply of water is available in the event of a scenario where water cannot be distributed from the system's source and treatment facilities. This is critical in small systems that may have only a single source of supply, a single treatment facility, and limited distribution system reinforcement. Reasons for not being able to supply water to the system could include an emergency in the source of supply (such as a spill), a power failure, or an upset or other treatment problem.

Note: Copy of relevant page from PSC regulations is attached.

Other states and other guidelines

-Many states utilize Ten States Standards guidance

-Most states in which AWS operates have not enforced the one-day storage standard

-Example of alternate criteria:

New Jersey utilizes a graduating scale between 20 percent to 100 percent of average day demand depending on:

a. Single vs. multiple source
b. Auxiliary power provisions
c. Interconnections with other water systems
d. Size of system

water from a utility's water loading station.

(2) "Distribution main" means a line from which service connections with customers are taken at frequent intervals.

(3) "Meter" means any device used for the purpose of measuring the quantity of water delivered by a utility to a customer.

(4) Natural Resources Cabinet" means the state Natural Resources and Environmental Protection Cabinet, Department for Environmental Protection, Division of Water.

(5) "Point of service" means the outlet of a customer's water meter, or valve if no meter is placed.

(6) "Service connection" means the line from the main to the customer's point of service, and shall include the pipe fittings and valves necessary to make the connection.

(7) "Service line" means the water line from the point of service to the place of consumption.

(8) "Transmission main" means a line which is used for conveying water to the distribution system, reservoirs, tanks or stand pipes, and has generally no service connections with customers.

Section 2. Information Available to Customers. A utility shall provide the following information to any customer upon request:

(1) Characteristics of water. A description in writing of chemical constituents and bacteriological standards of the treated water as required by the Natural Resources Cabinet.

(2) Rates. A schedule of rates for water service applicable to the service to be rendered to the customer.

(3) Reading meters. Information about method of reading meters.

(4) Bill analysis. A statement of the past readings of a customer's meter for a period of two (2) years.

Section 3. Quality of Water. (1) Compliance with Natural Resources Cabinet. Any utility furnishing water service for human consumption or domestic use shall conform to all legal requirements of the Natural Resources Cabinet for construction and operation of its water system as pertains to sanitation and potability of the water.

(2) Water supply. In absence of comparable requirements of the Natural Resources Cabinet, water supplied by any utility shall be:

(a) Adequately protected by artificial treatment to include continuous disinfection throughout the distribution system;

(b) Free from objectionable color, turbidity, taste, and odor; and

(c) From a source reasonably adequate to provide a continuous supply of water.

(3) Operation of supply system.

(a) Sanitary conditions. The water supply system, including wells, reservoirs, pumping equipment, treatment works, mains, and service pipes shall be free from sanitary defects.

(b) Potable water connections. No utility shall make a physical connection between its distribution system and that of any other water supply unless the other water supply maintains a safe sanitary quality in accordance with this administrative regulation, and the utility provides notice to the commission prior to any such interconnections.

(c) Algae growth. The growth of algae in water at the source of supply, in reservoirs or other basins, and in water mains, shall be controlled by proper treatment.

(d) Well integrity. Utilities obtaining water supplies from driven or bored wells must maintain the tightness of well casings and provide protection at the ground surface to prevent infiltration of water other than that from strata tapped by such wells. Wells shall be a minimum of 300 feet from any source of pollution.

(4) Testing of water.

(a) Test. Each utility shall have representative samples of its water examined by the appropriate state or local agency or by a competent chemist and bacteriologist skilled in the sanitary examination of water, under methods approved by the Natural Resources Cabinet, to insure a safe water supply.

(b) Report to the commission. If a utility is required by the Natural Resources Cabinet to make a public notification pursuant to administrative regulations of the Natural Resources Cabinet, the utility shall provide the commission with a copy of the public notification when it is made.

Section 4. Continuity of Service. (1) Emergency interruptions. Each utility shall make all reasonable efforts to prevent interruptions of service and when such interruptions occur shall endeavor to reestablish service with the shortest possible delay consistent with the safety of its consumers and the general public. If an emergency interruption of service affects service to any public fire protection device, the utility shall immediately notify the fire chief or other public official responsible for fire protection.

(2) Scheduled interruptions. If any utility finds it necessary to schedule an interruption of its service, it shall notify all customers to be affected by the interruption, stating the time and anticipated duration of the interruption. Whenever possible, scheduled interruptions shall be made at hours of least inconvenience to customers. If public fire protection is provided by mains affected by the interruptions, the utility shall notify the fire chief or other officials responsible for fire protection of the interruption, stating the time and anticipated duration. The fire chief or other official responsible for fire protection shall be notified immediately upon restoration of service.

(3) Standby equipment. The utility shall have available standby pumps capable of providing the maximum daily pumping demand of the system for use when any pump is out of service.

(4) Storage. The minimum storage capacity for systems shall be equal to the average daily consumption.

(5) Record of interruptions. Each utility shall keep a complete record of all interruptions on its entire system or on major divisions of that system. This record shall show the cause of interruption, date, time, duration, remedy and steps taken to prevent recurrence.

Section 5. Pressures. (1) Standard pressure. Each utility shall, subject to the approval of the commission, adopt and maintain a standard pressure in its distribution system at locations to be designated as the point or points of "standard pressure." The selection of such points shall be confined to locations fairly representative of average conditions. In selecting points for fixed standard pressure, a utility may divide its distribution system into districts if division is necessary due to differences of elevation or loss of pressure because of friction, or both, and may either adopt a standard pressure for each division or establish a single standard pressure for its distribution system as a whole. In no case shall the constant difference between the highest and lowest pressures in a district for which a standard has been adopted exceed fifty (50) percent of such standard. In the interpretation of this rule it shall be understood that in districts of widely varying elevations or low customer density a utility may undertake to furnish a service which does not comply with the foregoing specifications if the customer is fully advised of the conditions under which average service may be expected. It shall be understood that nothing shall prevent the commission from requiring improvements when, upon investigation, it appears right and proper that such betterments should be made. In no event, however, shall the pressure at the customer's service pipe under normal conditions fall below thirty (30) psig nor shall the static pressure exceed 150 psig.

(2) Pressure gauges. Each utility shall provide itself with one (1) or more recording pressure gauges to make pressure surveys as required by these rules. These gauges shall be suitable to record the pressure experienced on the utility's system and shall be able to record a continuous twenty-four (24) hour test. One (1) of these recording pressure gauges shall be maintained for a minimum of one (1) week per month in continuous service at some representative point on the utility's mains.

(3) Pressure surveys. At least once annually, each utility shall make a survey of pressures in its distribution system of sufficient magnitude to indicate the quality of service being rendered at representative points in its system. Pressure charts for these surveys shall show the date and time of beginning and end of the test and the location at which the test was made. Records of these pressure surveys shall be maintained at the utility's principal office in Kentucky and shall be made available to the commission upon request.

Section 6. Water Supply Measurement. (1) Measuring devices. Each utility shall install a suitable measuring device at each source

History

Summary of Previous Analysis

- Kentucky-American submittal of November 17, 1993 including engineering report
    - Requested deviation from 807 KAR 5:066 Section 4 (4)
    - Proposed providing one day storage in High Service and Sadieville; one-half day storage in Main Service; and one-half day capacity in standby power
    - Proposed construction of three 3 MG tanks by 2005 to achieve one-half day volume in Main Service
        - 3 MG pump storage tank at Clays Mill Road
        - A second 3 MG pump storage tank at Hume Road
        - A second 3 MG pump storage tank at Clays Mill Road
    - Proposed construction of two tanks by 2005 to achieve one day storage in High Service
        - 0.75 MG elevated tank northeast of Avon Depot
        - 1 MG pumped storage tank at Russell Cave Pike
- Commission order dated December 20, 1993 granting deviation, with proposed tanks to be constructed by 2005
- Estimated cost of tanks to be constructed: $8,900,000
- Estimated savings by not constructing one day storage: $8,000,000 to $11,000,000

Storage Improvements Since 1993

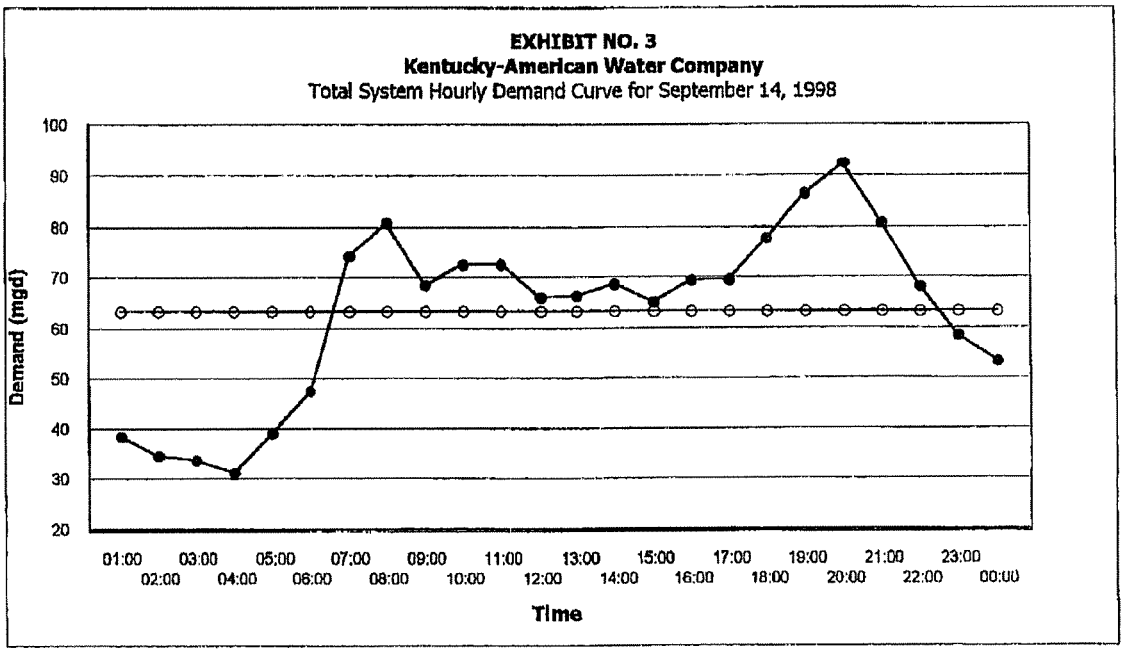
- Clays Mill 3 MG tank and booster station completed in 1993
    - Cost = $3.12 million
- Briar Hill 0.75 MG elevated tank (High Service) completed in 2000
    - Cost = $1.64 million
- Telemetry improvements completed in 2000
    - Cost = $530,000

Current Analysis

ISSUE: Will the three additional proposed tanks provide significant benefit to the Kentucky-American system?

- New analysis incorporates new demand projections and usage data, extends analysis to 2015
- Equalization analysis
  (see accompanying graph)
- Equalization rates: 12 to 20 % of daily demand
- Equalization and fire flow needs are met through 2015 by existing storage facilities
  (NOTE: not including clearwell volume; including only effective volume)
  (see accompanying table)
- Volume needed to meet amended PSC requirement
  - 6.79 MG in Main Service by 2015
  - 2.45 MG in High Service by 2015

Hourly Demand Curve



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Storage Capacity Analysis

Kentucky-American Water Company
2000 Storage Capacity Analysis

Year	Avg Day (MGD)	Max Day (MGD)	* Existing Effective Storage (MG)	Equalization Storage Need (MG)	Equalization + Fire Flow Need (MG)	Equalization + Fire Flow Surplus/Deficit (MG)	** Emergency Storage Requirement (MG)	Emergency Storage Surplus/Deficit (MG)
Main Service Gradient (12% equalization factor)								
2000	36.9	67.7	13.41	8.10	10.02	3.39	18.50	-5.09
2005	38.3	70.0	13.41	8.40	10.32	3.09	19.20	-5.79
2010	39.6	72.2	13.41	8.70	10.62	2.79	19.80	-6.39
2015	40.3	73.3	13.41	8.80	10.72	2.69	20.20	-6.79
High Service Gradient (15% equalization factor)								
2000	3.84	6.98	1.70	1.05	1.68	0.02	3.84	-2.14
2005	3.95	7.30	1.70	1.10	1.73	-0.03	3.95	-2.25
2010	4.05	7.50	1.70	1.13	1.76	-0.06	4.05	-2.35
2015	4.15	7.60	1.70	1.14	1.77	-0.07	4.15	-2.45
Sadieville Gradient (20% equalization factor)								
2000	0.081	0.149	0.25	0.030	0.210	0.040	0.081	0.169
2005	0.084	0.154	0.25	0.031	0.211	0.039	0.084	0.166
2010	0.087	0.159	0.25	0.032	0.212	0.038	0.087	0.163
2015	0.089	0.161	0.25	0.032	0.212	0.038	0.090	0.160

MG = Million Gallons
MGD = Million Gallons Per Day
*** Does Not Include Clearwell Storage at the Treatment Plants**
**** 50% for Main Service, 100% for High Service and Sadieville**

Reliability Analysis

- Total failure of a single major component
  (source, treatment, or booster station)
- Compared to average demand
- Power outage analysis compared to ½ average day demand
- Conservative scenarios

Sadieville

- served via valve
- not at risk during power outage
- 1+ day storage available

High Service gradient

- 4 boosters serve High Service
- 7.7 mgd of standby power at Newtown Booster

Main Service

a) Loss of Jacobson Reservoir
- Water can be directed to RRS directly from Kentucky River
- Both plants can continue to operate
- Storage available

b) Loss of Kentucky River
- Use Jacobson Reservoir and Lake Ellerslie
- Pump from clearwells at KRS and RRS
- Can meet approximately one day at full average demand, or continuous at one-half average day demand
- Storage available
- Customer conservation request would be reasonable in this emergency scenario

c) Loss of Richmond Road Station
- KRS continues at 40 mgd
- Storage available

d) Loss of Kentucky River Station
- Results similar to b)
- RRS continues at 25 mgd
- Storage available
- Approximately one day at full average day demand; or continuous at one-half average day demand

e) Power outage
- 11.58 MG available from storage – elevated tanks or standby power at tanks
- 26.4 MGD of standby power available at plants

Conclusion – all reliability scenarios are met by existing storage

Analysis still undergoing

- Study details of 2000 peak day occurrence
- Assess "non-numerical" needs:
    - o Localized hydraulic issues or special customer needs
    - o Age and structural conditions of existing tanks
    - o Maintenance needs on existing tanks
    - o Meeting system demands during tank maintenance

ISSUE: **Estimated cost to provide 9 MG of additional storage to meet Commission's Order of December 20, 1993 is $15,000,000.**

Given the limited additional benefits in reliability that additional storage provides and the potential water quality problems and other major capital expenditures which will be needed for source of supply and production facilities, is the expenditure for additional finished water storage in the best interest of the ratepayers of Kentucky-American?

Kentucky-American Water Company

2300 Richmond Road • Lexington, Kentucky 40502 • (606) 269-2386 • Fax (606) 268-6327

March 27, 2000
BP 96-18

KENTUCKY-AMERICAN WATER COMPANY

BRIAR HILL ROAD ELEVATED TANK AND BOOSTER PUMP STATION

COMPLETION MEMORANDUM

DESCRIPTION:

This project was proposed to design and construct an elevated storage tank and booster pump station on Briar Hill Road to address a storage deficit and provide adequate pressure.

ORIGINAL COST ESTIMATE:

$1,470,000

REVISION TO COST ESTIMATE:

$1,370,000 – October 27, 1997

FINAL COST:

$1,641,162

VARIANCE:

The project cost was revised originally due to extremely favorable construction bids having been received. The project was completed for $271,162, or 19.8% over the final estimate, and $171,162, or 11.64%, of the original estimate.

PROBLEMS ENCOUNTERED:

There were several problems encountered during the course of the project, including: 1) land purchase closing, which caused significant project delays, 2) relocation of pump station, 3) transition of project managers and 4) problems with providing electrical service. The electrical service to the booster station was an unforeseen expense that caused the construction of the booster station to exceed the estimate by $258,969. The electric service provider reviewed the design prior to construction work and provided minimal cost estimate. After construction had begun the provider determined that adequate service was not available and nearly three miles of new wire had to be run. The delays also contributed to increased costs, as AFUDC exceeded the estimate of $83,000. The project was completed over one year behind schedule.

RESULTS ACHIEVED:

The tank and booster station was constructed and is now providing reliable pressure and service for customers in Bourbon County, and will provide service in Clark County with the conclusion of the purchase water contract in October, 2001.

Nick O. Rowe
Vice President - Operations

NOR/dm

Richard C Svindland 02/17/2000 13:42

To: David M Reves/SYSENG/CORP/AWWSC@AWW, Gary A Naumick/SYSENG/CORP/AWWSC@AWW
cc:

Subject: KAWC - System Storage.

Gary and Dave,

I copied into this e-mail two e-mails I wrote to Linda and John back in Dec. 1999. The first e-mail is my interpretation of the system storage, the second e-mail covers a math mistake I made in the first e-mail.

First e-mail:
Linda, I just read over the memo you sent out regarding the system storage requirements and the variance KAWC received until 2005. I have a couple of comments regarding the storage analysis. I agree that the 50/50 approach is a good method for large water systems such as ours, but I want to point out a couple of items to make sure we are covered, especially since people maybe inquiring about the PSC ruling.

The following is the regulation verbatim from 807 KAR 5:066. Water Section 4 item (4) *"The minimum storage capacity for systems shall be equal to the average daily consumption."*

All the states I have worked in use similar language to the PSC regulation. Although the regulation does not explicitly state it, I have always interpreted that regulation to mean that the storage capacity should be "elevated storage" (i.e. in the event of loss of power water is still available). This may be considered a little conservative, but it insures that water is available in the event power is lost. Tennessee's regulation does actually state that the storage must be elevated and that the rule-of-thumb for the amount is 24 hours worth of supply.

Clays Mill Tank (3MG) and Hume Road Tank (3MG) each have booster pump stations with generators to power the pumps in the event of loss of power, so these meet my interpretation of being considered "elevated storage". Parkers Mill Tank has a booster pump station with a direct coupled diesel engine driven pump so this station also meets my interpretation of being elevated storage.

Mercer Road (2MG) and Cox Street elevated (1MG), each have a single booster pump to increase pressure. These pumps do not have backup power, but since these are elevated tanks they meet my interpretation because they could still serve the surrounding area in the event of loss of power.

Tates Creek Elevated tank (0.5MG) by definition meets my interpretation, however, this tank is never full so it cannot be counted on for storage.

Cox Street Ground Storage Tank (1MG) and York Street ground storage tank 1MG each have a single booster pump to pump into the system; however, the pumps do not have backup power capability (I am guessing at York Street since I have not yet looked in the pump station vault but since it was built at the same time as Cox, and since it is below ground I am assuming it is the same configuration as the Cox St. booster). These two tanks do not meet my interpretation of being considered elevated storage since there is no way to insure water is available at all times and in all circumstances.

Using my interpretation of the PSC rule, 2.5 MG of storage could not be counted on for storage. Per the analysis in the memo I read, a total of 18.61 MG of storage is needed by 2005. This equates to an additional 9.61 MG which is needed by 2005. Of course if we added backup power at York and Cox than 7.61 MG would be needed, however, keep in mind that each of these pump stations only has one pump and that in itself may not meet the requirement of 807 KAR 5:066. Water Section 4 item (3) which requires standby equipment.

These are just my thoughts and my interpretation of the PSC regulation. I feel it is something we should

be prepared to answer especially since we have asked for the 50/50 variance. I also think we must be clear in our definition of storage since we are only counting on one half days demand.

Please let me know what you think and if you would like me to look into anything further.

Rich S.

second e-mail:
Linda, John,

I made a math mistake in the e-mail I sent out yesterday. I forgot to include the Parkers Mill Tank (3MG) in my computation. Therefore if 50% avg. daily flow is 18.61 MGD and assuming that Clays Mill (3MG) Hume Rd. (3MG) Parkers Mill (3MG), Cox St Elev. (1MG) and Mercer Road (2MG) are all considered elevated storage then an additional 6.61MG of storage is needed in the main service area instead of the 9.61MG in my e-mail. If Cox Ground and York St are improved with backup power and a second pump then the additional storage required would be reduced to 4.61 MG.

The addition of a second tank 3MG tank at Hume Road and Clays Mill would almost eliminate the tank deficit. Perhaps the addition of some piping connections at Cox Street could be added so that in the event of loss of power we could use our trailer mounted pump to pump from the tank into the system. This would be a lot cheaper than fully converting Cox and York to backup power and a second pump.

Sorry for the mistake.

Rich S,

Hope you find this helpful in your analysis.

Rich S. - KAWC

Richard C Svindland 12/02/99 04:07 PM

To: John Hill/KAWC/AWWSC@AWW, Linda Bridwell/KAWC/AWWSC@AWW
cc:

Subject: System Storage requirements

Linda, John.

I made a math mistake in the e-mail I sent out yesterday. I forgot to include the Parkers Mill Tank (3MG) in my computation. Therefore if 50% avg. daily flow is 18.61 MGD and assuming that Clays Mill (3MG) Hume Rd. (3MG) Parkers Mill (3MG), Cox St Elev. (1MG) and Mercer Road (2MG) are all considered elevated storage then an additonal 6.61MG of storage is needed in the main service area instead of the 9.61MG in my e-mail. If Cox Ground and York St are improved with backup power and a second pump then the additonal storage required would be reduced to 4.61 MG.

The addition of a second tank 3MG tank at Hume Road and Clays Mill would almost eliminate the tank deficit. Perhaps the additon of some piping connections at Cox Street could be added so that in the event of loss of power we could use our trailer mounted pump to pump from the tank into the system. This would be a lot cheaper than fully converting Cox and York to backup power and a second pump.

Sorry for the mistake.

Rich S,

Richard C Svindland 12/27/99 05:12 PM

To: Nick Rowe/KAWC/AWWSC@AWW
cc: Darrell Ary/KAWC/AWWSC@AWW, Rick Buchanan/KAWC/AWWSC@AWW, Dillard Griffin/KAWC/AWWSC@AWW, John Hill/KAWC/AWWSC@AWW, Linda Bridwell/KAWC/AWWSC@AWW

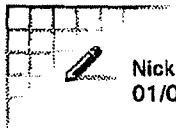
Subject: Cox Street GST Estimated Repair Costs

I just finished reading the report by TIC on the Cox St. GST. Their minimum estimated cost to repair the tank is $107,000 which includes about $8000 for contingency items. For your info, I have broken down this cost into two items, repair work and maintenance work. Repair work covers the costs to repair the damage to the tank from overfilling and is estimated at $73,000. Maintenance work covers costs to make other misc. repairs noted in the TIC report such as ladder upgrade, vent modifications, foundation repair, etc. and is estimated at $26,000.

The estimated life for the interior paint system is 6 to 8 years. The estimated life on the tank exterior is 8 to 10 years.

The above $107k cost only covers spot cleaning and painting in the damaged areas of the tank. If the entire tank is to be repainted (sand blasted int. and ext.) TIC estimates the total project costs including above repairs at $408,000 with $18,000 for contingency items.

Let me know if you would like to review the report and any other comments you may have. When you get a chance lets all talk so see how we should proceed.



Nick Rowe
01/04/2000 01:49 PM

To: Linda Bridwell/KAWC/AWWSC@AWW
cc:

Subject: Re: Storage Tank Requirements

Nice, quick, response!
Linda Bridwell

To: Gary A Naumick/SYSENG/CORP/AWWSC@AWW
cc: Nick Rowe/KAWC/AWWSC@AWW, John Hill/KAWC/AWWSC@AWW, Richard C Svindland/KAWC/AWWSC@AWW, Kevin Kennoy/KAWC/AWWSC@AWW

Subject: Storage Tank Requirements

Thanks for calling me yesterday while you are on the road. Kevin has the pump info from RRS but still needed KRS. He'll get that out to you today if it didn't go out yesterday. With this, you should be able to finalize the equalization storage needs, which will give us a starting place.
If you can get that wrapped up by the week of the 17th, I would like to get you together with Nick, Rich, John, Kevin and I to discuss. I want to make sure we are taking a hard look at our storage capabilities and needs.
This will give us about two weeks to do any additional analysis if needed. We can schedule a meeting with the PSC staff for the week of February 7th. I would like to go in with a real solid plan laid out for them. Although I don't expect an answer from them immediately, we should be able to get enough of a feel to make any adjustments, if necessary, to the Five Year Strategic Plan.
Please let me know if you need any additional information. I updated the demand projections earlier in the year, and Rich has been doing a thorough review of our tank sites, which will need to be factored in as well.
If this schedule fits with you, just give me a couple of times during the week of the 17th that you could either come in or get on a conference call with us. I know you're going to be pretty tied up with the Cal-Am transition, so we can work around your schedule. Nick and I have a meeting with the auditors on the 21st, but the rest of the week is pretty flexible.
Thanks,
Linda

Linda C. Bridwell, P.E.
Director of Engineering

COPY

Memorandum

To: John Hill

From: Linda C. Bridwell

Date: May 18, 1999

Re: ***Storage Tank Requirement***

In 1988, KAWC applied for and received a deviation from the PSC requirement to provide a minimum of one day's supply of its average daily water use. The deviation was granted until July 1, 1993, based on the proposed third treatment plant under design, and required a comprehensive analysis of the storage needs as part of the next CPS.

During the development of the 1992 LC/CPS, an extensive analysis was completed. Based on this analysis, KAWC requested and received a further deviation from the PSC through December 31, 2005. This deviation was based on the following proposed construction:

1. 3.0 MG pumped storage at Clays Mill Road
2. 3.0 MG additional pumped storage at Hume Road
3. 0.75 MG elevated tank at Avon
4. 1.0 MG pumped storage at Russell Cave
5. 3.0 MG additional pumped storage at Clays Mill Road

The analysis assumed the operation of the continued Sadieville tank and a maximum day of only 68.38 MGD in 2005. This projected max day has now been revised to 76.92 MGD.

Of the five projects, only Items 1 and 3 have been completed. There is a real possibility that Item 2 and/or Item 5 can be eliminated with the construction of the Bluegrass Water Project. Item 4 will still need to be constructed.

The distribution system was divided into three areas for analysis. Storage was determined based on the greater of either equalization and fire protection, or emergency storage. The requirements determined in the 1992 analysis and existing storage are:

	Storage Requirements	Existing Storage
Main Service Zone	18.84 MGD	14.50 MGD
North Service Zone	2.39 MGD	1.71 MGD *
Sadieville Service Zone	.21 MGD	.75 MGD *

* With the Sadieville tank out of service, I have included the Muddy Ford Tank in both service zones. The volume available to Sadieville from the Muddy Ford Tank needs to be determined.

Please keep in mind that demand projections used in the previous analysis are now considered too low. Emergency storage based on 50% average day assumed a projected average day for 2000 of only 39.94 MGD. Our actual 1998 average day was over 42 MGD. A third supply could reduce the emergency storage to less than 50% of our average day demand.

As Boonesboro is currently operating as a separate system, their storage needs are being met by the two Clark County tanks and I have not included them here.

The analysis needs to be completely updated as part of our new CPS before we can anticipate eliminating more than one tank. Once the analysis is complete, we probably ought to get the opinion of PSC Engineering staff.

I have attached a copy of the Application and the Analysis. Let me know if you have any questions.

LCB/dm

Attachments

Approved at Board of Directors Meeting December 16, 1997

Kentucky-American Water Company

2300 Richmond Road • Lexington, Kentucky 40502 • (606) 269-2386 • Fax (606) 268-6327

October 27, 1997
BP 96-18
Project No. 10617

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL BUDGET PROJECT 96-18
CONSTRUCT AVON TANK AND BOOSTER STATION

REFERENCE: 1992 LC/CPS Project Number B-6
1993 Storage Capacity Analysis
Budget Project Memorandum Dated September 20, 1996

ESTIMATED COST:

Approved Estimated Cost	$1,470,000
Prior Expenditures	55,000
Budgeted 1997 Expenditure	1,215,000
Budgeted 1998 Expenditure	$ 200,000
Revised Estimated Cost	$1,370,000
Proposed Expenditure Through 1997	225,000
Proposed 1998 Expenditure	$1,145,000

DISCUSSION:

Delays in closing the land purchase and approval of the Certificate of Convenience and Necessity from the Public Service Commission have pushed the project back; however, it is still anticipated to be completed within 30 days of the original schedule.

Favorable construction bids have been received and reduced the overall proposed construction expenditures by $100,000.

BUDGET PROJECT REVIEW

DEPARTMENT	BY:	DATE:
ENGINEERING		11-10-97
WATER QUALITY		11/10/97
OTHER		

RECOMMENDED FOR APPROVAL

PRESIDENT 11/14/97

Roy W. Mundy II
Vice President and Manager

Equal Opportunity Employer

KENTUCKY-AMERICAN WATER COMPANY

AVON ELEVATED TANK AND BOOSTER

Detailed Cost Estimate

ITEM	RESPONSIBILITY	9/20/96 ESTIMATE	10/27/97 ESTIMATE
Legal	Contract	$20,000	$20,000
Engineering Design	Consultant	90,000	75,000
Tank Construction	Contract	900,000	850,000
Booster Construction	Contract	250,000	230,000
Inspection/Materials Testing	Consultant	25,000	25,000
Consultant Technical Review	Consultant	30,000	25,000
Project Administration	Water Company	25,000	25,000
O&C		60,000	50,000
	Subtotal	$1,400,000	$1,300,000
	AFUDC	70,000	70,000
	TOTAL	$1,470,000	$1,370,000

Kentucky-American Water Company
Economic Analysis of the Impact of Capital Spending Proposal
Construct Avon Tank and Booster Station

Determination of Revenue Requirement			
Authorized Rate of Return on Common Equity			11.00%
Federal Income Tax Rate			35.00%
Return on Common Equity before FIT			16.92%
State Income Tax Rate			8.25%
Required Rate of Return on CE for Project			18.44%
Common Equity Ratio for Project			40.00%
Weighted Cost of Common Equity before Tax			7.38%
Long Term Debt Ratio for Project			60.00%
Estimated Cost Rate for New Debt			7.00%
Weighted Cost of Debt			4.20%
Total Pre-Tax Cost of Capital			11.58%
Total Estimated Cost of Project			$1,370,000
Investment by Others			0
Net Investment Financed by Company			1,370,000
New Common Equity	$548,000		
New Long Term Debt	822,000		

Total Revenue Requirement		Amount	Rate
Required Pre-Tax Operating Income		$158,646	11.58%
Depreciation Rate	2.450%	33,565	2.45%
Property Tax Rate	0.6990%	9,576	0.70%
Change in Operation & Maint. Expense		0	0.00%
Revenue from New Customers		0	0.00%
Total Net Revenue Requirement		$201,787	14.73%
Revenue Tax Rate	0.14537%	294	0.02%
Total Revenue Requirement		$202,081	14.75%
Latest 12 Months Revenue		$34,075,736	
Required Price Increase		0.59%	

KENTUCKY-AMERICAN WATER COMPANY
AVON TANK AND BOOSTER
BP 96-15
1998

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
DELIVERY OF TANK STEEL	CONTRACT												
TANK ERECTION	CONTRACT												
TANK PAINTING & DISINFECTION	CONTRACT												
BOOSTER STATION DELIVERY	CONTRACT												
INSTALL START-UP BOOSTER	CONTRACT												
PROJECT MANAGEMENT	KAWC												
FIELD INSPECTION	KAWC												
CASH FORECAST	$1,145,000	$110,000	$110,000	$160,000	$200,000	$250,000	$150,000	$150,000	$20,000				

Kentucky-American Water Company

2300 Richmond Road • Lexington, Kentucky 40502 • (606) 269-2386 • Fax (606) 268-6327

Approved at Board of Directors Meeting July 22, 1997

June 12, 1997
BP 96-18
Project No. 10617

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL BUDGET PROJECT
AVON ELEVATED TANK AND BOOSTER

REFERENCE: 1992 Least Cost/Comprehensive Planning Study, Project B-6;
1993 Storage Analysis
Budget Project Memorandum Dated September 20, 1996

ESTIMATED COST:

Budgeted Estimated Cost	$1,470,000
Budgeted 1997 Expenditure	$1,270,000
Budgeted 1998 Expenditure	$ 200,000
Revised Estimated Cost	$1,470,000
Proposed 1997 Expenditure	$1,020,000
Proposed 1998 Expenditure	$ 450,000

DISCUSSION:

This budget project is being revised to reflect a revision to the project schedule. The start of the project was impacted by negotiations for the purchase of land for the tank. The land has been secured and the design of the tank is in progress. The construction schedule and the construction expenditures have been impacted by the schedule revision and this budget project accounts for additional construction expenditures that are anticipated to be needed in 1998. The overall budget for the project has not been revised.

BUDGET PROJECT REVIEW

DEPARTMENT:	BY:	DATE:
ENGINEERING	John V. Young V	6-20-97
WATER QUALITY	Richard Moser	6/20/97
OTHER		
RECOMMENDED FOR APPROVAL:		
PRESIDENT		6/20/97

Roy W. Mundy II
Vice President and Manager

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Equal Opportunity Employer

KENTUCKY-AMERICAN WATER COMPANY
AVON ELEVATED TANK AND BOOSTER

DETAILED COST ESTIMATE

Item	Responsibility	Expenditure
Legal	Contract	$ 20,000
Engineering Design	Consultant	90,000
Tank Construction	Contract	900,000
Booster Construction	Contract	250,000
Inspection/Materials Testing	Consultant	25,000
Consultant Technical Review	Consultant	30,000
Project Administration	Water Company	25,000
Omissions and Contingencies		60,000
	Subtotal	$1,400,000
	AFUDC	70,000
	Total	**$1,470,000**

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ECONOMIC ANAYSIS OF THE IMPACT OF CAPITAL
AVON ELEVATED TANK AND BOOSTER
BUDGET PROJECT 96-18

Determination of Revenue Requirement			
Authorized Rate of Return on Common Equity			11.00%
Federal Income Tax Rate			35.00%
Return on Common Equity before FIT			16.92%
State Income Tax Rate			8.25%
Required Rate of Return on CE for Project			18.44%
Common Equity Ratio for Project			40.00%
Weighted Cost of Common Equity before Tax			7.38%
Long Term Debt Ratio for Project			60.00%
Estimated Cost Rate for New Debt			7.80%
Weighted Cost of Debt			4.68%
Total Pre-Tax Cost of Capital			12.06%
Total Estimated Cost of Project			$1,470,000
Investment by Others			0
Net Investment Financed by Company			1,470,000
New Common Equity	$588,000		
New Long Term Debt	882,000		

Total Revenue Requirement		Amount	Rate
Required Pre-Tax Operating Income		$177,282	12.06%
Depreciation Rate	2.20%	32,340	2.20%
Property Tax Rate	0.6959%	10,230	0.70%
Change in Operation & Maint. Expense		0	0.00%
Revenue from New Customers		0	0.00%
Total Net Revenue Requirement		$219,852	14.96%
Revenue Tax Rate	0.14537%	320	0.02%
Total Revenue Requirement		$220,172	14.98%
12 Months Revenue Ended 05/31/97		$34,821,223	
Required Price Increase		0.63%	

KENTUCKY-AMERICAN WATER COMPANY
AVON TANK AND BOOSTER
BP 96-18
1997

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Property Acquisition	KAWC												
Survey	Contract												
Borings	Contract												
Retain Consultant	KAWC												
Detailed Design	Contract												
Permits	KAWC												
Retain Contractor	KAWC												
Mobilization	Contract												
Site Work	Contract												
Submittals	Contract												
Material Delivery	Contract												
Tank Construction	Contract												
Booster Stat Delivery	Contract												
Install Booster	Contract												
Project Management	KAWC												
Field Inspection	KAWC												
CASH FORECAST	$1,020,000	$0	$4,350	$2,480	$18,531	$60,000	$60,000	$60,000	$60,000	$60,000	$160,000	$160,000	$323,170

KENTUCKY-AMERICAN WATER COMPANY AVON TANK AND BOOSTER ~~BP 96-18~~ 1998													
DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Tank Paint/Disinfect	Contract												
Project Management	KAWC												
Field Inspection	KAWC												
Tank Construction	Contract												
CASH FORECAST	$450,000	$160,000	$60,000	$10,000	$100,000	$50,000	$50,000	$20,000					

Approved at Board of
Directors Meeting
July 22, 1997

Kentucky-American Water Company

2300 Richmond Road • Lexington, Kentucky 40502 • (606) 269-2386 • Fax (606) 268-6327

June 12, 1997
BP 96-18
Project No. 10617

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL BUDGET PROJECT
AVON ELEVATED TANK AND BOOSTER

REFERENCE: 1992 Least Cost/Comprehensive Planning Study, Project B-6;
1993 Storage Analysis
Budget Project Memorandum Dated September 20, 1996

ESTIMATED COST:

Budgeted Estimated Cost	$1,470,000
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Proposed 1997 Expenditure	$1,020,000
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DISCUSSION:

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BUDGET PROJECT REVIEW

DEPARTMENT:	BY:	DATE:
ENGINEERING	John V. Young V	6-20-97
WATER QUALITY	Richard Moore	6/20/97
OTHER		
RECOMMENDED FOR APPROVAL:		
PRESIDENT		6/24/97

Roy W. Mundy II
Vice President and Manager

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KENTUCKY-AMERICAN WATER COMPANY
AVON ELEVATED TANK AND BOOSTER

DETAILED COST ESTIMATE

Item	Responsibility	Expenditure
Legal	Contract	$ 20,000
Engineering Design	Consultant	90,000
Tank Construction	Contract	900,000
Booster Construction	Contract	250,000
Inspection/Materials Testing	Consultant	25,000
Consultant Technical Review	Consultant	30,000
Project Administration	Water Company	25,000
Omissions and Contingencies		60,000
	Subtotal	$1,400,000
	AFUDC	70,000
	Total	**$1,470,000**

ECONOMIC ANAYSIS OF THE IMPACT OF CAPITAL
AVON ELEVATED TANK AND BOOSTER
BUDGET PROJECT 96-18

Determination of Revenue Requirement			
Authorized Rate of Return on Common Equity			11.00%
Federal Income Tax Rate			35.00%
Return on Common Equity before FIT			16.92%
State Income Tax Rate			8.25%
Required Rate of Return on CE for Project			18.44%
Common Equity Ratio for Project			40.00%
Weighted Cost of Common Equity before Tax			7.38%
Long Term Debt Ratio for Project			60.00%
Estimated Cost Rate for New Debt			7.80%
Weighted Cost of Debt			4.68%
Total Pre-Tax Cost of Capital			12.06%
Total Estimated Cost of Project			$1,470,000
Investment by Others			0
Net Investment Financed by Company			1,470,000
New Common Equity	$588,000		
New Long Term Debt	882,000		
Total Revenue Requirement		Amount	Rate
Required Pre-Tax Operating Income		$177,282	12.06%
Depreciation Rate	2.20%	32,340	2.20%
Property Tax Rate	0.6959%	10,230	0.70%
Change in Operation & Maint. Expense		0	0.00%
Revenue from New Customers		0	0.00%
Total Net Revenue Requirement		$219,852	14.96%
Revenue Tax Rate	0.14537%	320	0.02%
Total Revenue Requirement		$220,172	14.98%
12 Months Revenue Ended 05/31/97		$34,821,223	
Required Price Increase		0.63%	

KENTUCKY-AMERICAN WATER COMPANY
AVON TANK AND BOOSTER
BP 96-18
1997

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Property Acquisition	KAWC	■	■	■	■	■							
Survey	Contract												
Borings	Contract	■											
Retain Consultant	KAWC												
Detailed Design	Contract	■	■	■	■	■	■						
Permits	KAWC		■	■	■								
Retain Contractor	KAWC							■	■				
Mobilization	Contract					■				■			
Site Work	Contract										■	■	■
Submittals	Contract							■	■				
Material Delivery	Contract									■	■	■	
Tank Construction	Contract												■
Booster Stat Delivery	Contract									■	■	■	■
Install Booster	Contract											■	■
Project Management	KAWC	■	■	■	■	■	■	■	■	■	■	■	■
Field Inspection	KAWC						■	■	■	■	■	■	■
CASH FORECAST	$1,020,000	$0	$4,350	$2,480	$18,531	$60,000	$60,000	$60,000	$60,000	$60,000	$160,000	$160,000	$323,170

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KENTUCKY-AMERICAN WATER COMPANY
AVON TANK AND BOOSTER
BP 96-18
1998

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
Tank Paint/Disinfect	Contract												
Project Management	KAWC												
Field Inspection	KAWC												
Tank Construction	Contract												
CASH FORECAST	**$450,000**	**$160,000**	**$60,000**	**$10,000**	**$100,000**	**$50,000**	**$50,000**	**$20,000**					

Approved at Board of
Directors Meeting
October 22, 1996

Kentucky-American Water Company

200 East Park Drive • Suite 600 • P.O. Box 1688 • Mt. Laurel, New Jersey 08054 • 609-778-0400

September 20, 1996
BP 96-18
Project 10617

KENTUCKY-AMERICAN WATER COMPANY
PROPOSED CAPITAL BUDGET PROJECT
AVON ELEVATED TANK AND BOOSTER

REFERENCE

1992 LC/CPS project number B-6 and 1993 Storage Capacity Analysis

SUBJECT OF STUDY

The construction of an elevated storage tank and booster station in the northeastern section of the distribution system.

RECOMMENDATION

It is recommended that funds be authorized for design and construction of a booster station on Briar Hill Road and a 0.75 MG elevated storage tank at the Bluegrass Station, in Avon, to address a storage deficit and provide adequate pressure.

ESTIMATED COST

Total Estimated Cost	$1,470,000
Proposed 1996 Expenditures	$55,000
Proposed 1997 Expenditures	$1,215,000
Proposed 1998 Expenditures	$200,000

ADEQUACY

The funds are adequate for the proposed design and construction of a 0.75 MG elevated storage tank and the proposed booster station.

BUDGET PROJECT REVIEW

DEPARTMENT: BY: DATE:
ENGINEERING 9.20.96
WATER QUALITY
OTHER
RECOMMENDED FOR APPROVAL:
PRESIDENT 9/20/96

DISCUSSION

This project was proposed in the 1992 LC/CPS and was included in the five year plan after the construction of the Russell Cave Road tank. The land for the Russell Cave Road tank was to be purchased in 1996 under approved BP 95-05 with design in 1997 and construction in 1998. Because of increased growth out the Winchester Road corridor and the potential for water sales to the Boonesboro Water Association, it was decided that Kentucky-American Water Company should construct the Avon tank first, and then construct the Russell Cave tank in subsequent years.

This tank is for the direct benefit of Kentucky-American Water Company's existing customers and is necessary to continue to provide adequate service. It will also, however, facilitate the water sales to the Boonesboro Water Association, which is negotiating a purchase water agreement. The Bluegrass Station has agreed to donate the land for the tank construction.

In addition, the Boonesboro Water Association, which services 1,125 customers in Western Clark County, has indicated that they are considering the possible sale of the entire system to Kentucky-American Water Company in the near future, however, they see water sales as the logical first step. The proposed water sales serve 80 percent of their system.

This project, which was also recommended in the 1993 Storage Capacity Analysis which was filed with the Kentucky Public Service Commission, will provide equalization pressures during high demand periods during the day. The project also includes the construction of a new booster pump station and the development of a new pressure gradient to serve Kentucky-American's customers in this area and to serve Boonesboro.

Wayne D. Morgan, P.E.
Vice President

/kam

KENTUCKY-AMERICAN WATER COMPANY
AVON ELEVATED TANK AND BOOSTER

Detailed Cost Estimate

Item	Responsibility	~~1996~~ Expenditure
Legal	Contract	$20,000
Engineering Design	Consultant	90,000
Tank Construction	Contract	900,000
Booster Construction	Contract	250,000
Inspection/Materials Testing	Consultant	25,000
Consultant Technical Review	Consultant	30,000
Project Administration	Water Company	25,000
Omissions and Contingencies		60,000
	Subtotal	$1,400,000
AFUDC		70,000
	TOTAL	**$1,470,000**

The rate impact related to the capital cost of the project will be 0.71 percent.

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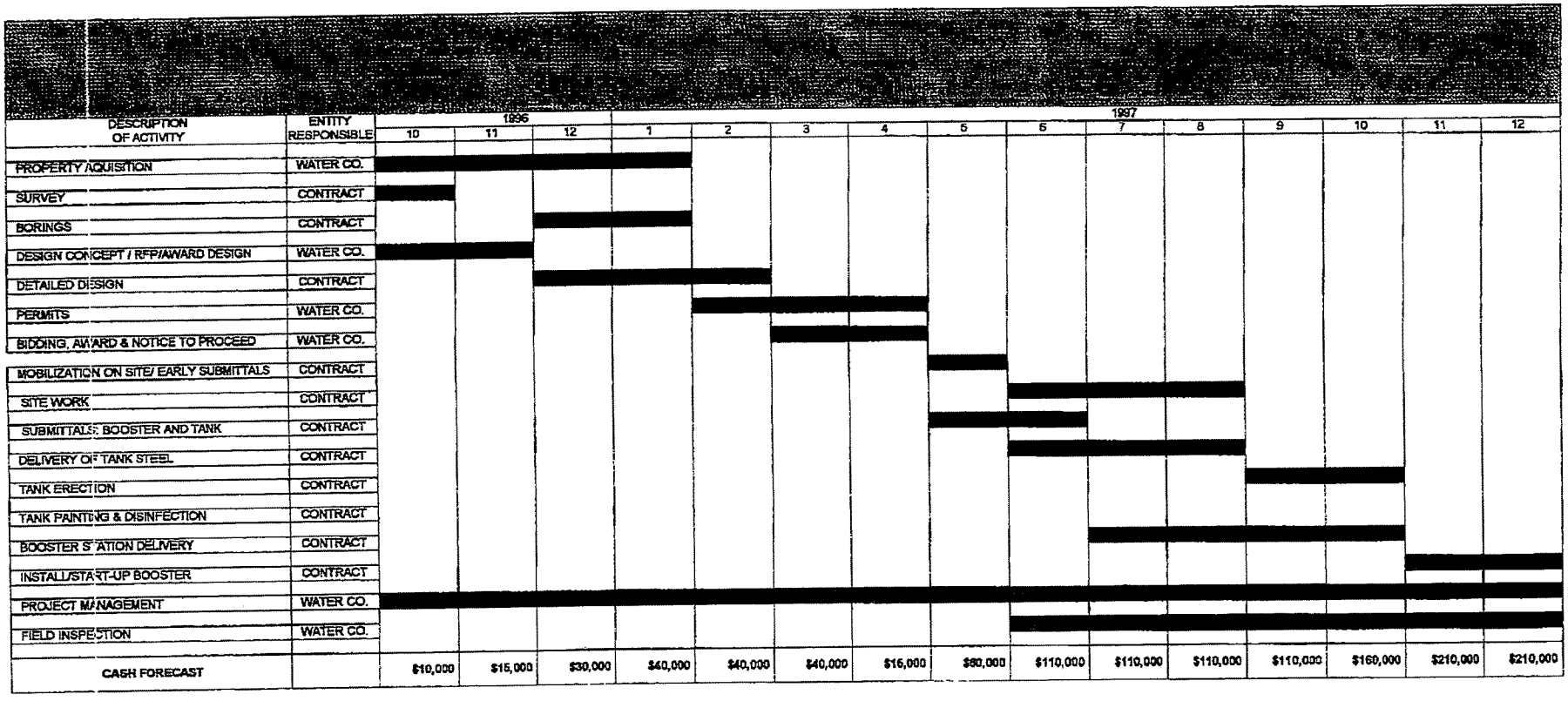
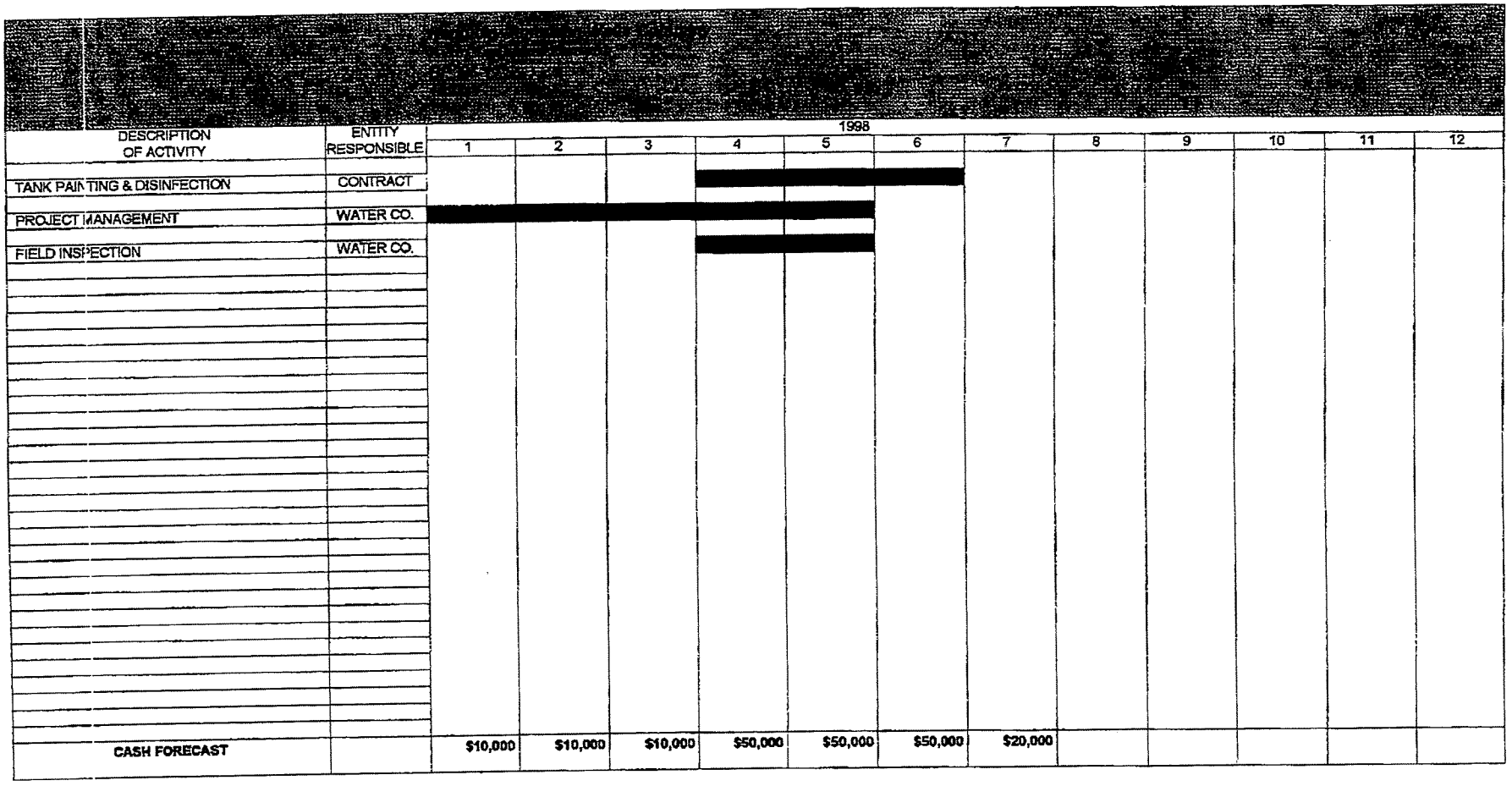


DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	1996 10	11	12	1997 1	2	3	4	5	6	7	8	9	10	11	12
PROPERTY AQUISITION	WATER CO.															
SURVEY	CONTRACT															
BORINGS	CONTRACT															
DESIGN CONCEPT / RFP/AWARD DESIGN	WATER CO.															
DETAILED DESIGN	CONTRACT															
PERMITS	WATER CO.															
BIDDING, AWARD & NOTICE TO PROCEED	WATER CO.															
MOBILIZATION ON SITE/ EARLY SUBMITTALS	CONTRACT															
SITE WORK	CONTRACT															
SUBMITTALS: BOOSTER AND TANK	CONTRACT															
DELIVERY OF TANK STEEL	CONTRACT															
TANK ERECTION	CONTRACT															
TANK PAINTING & DISINFECTION	CONTRACT															
BOOSTER STATION DELIVERY	CONTRACT															
INSTALL/START-UP BOOSTER	CONTRACT															
PROJECT MANAGEMENT	WATER CO.															
FIELD INSPECTION	WATER CO.															
CASH FORECAST		$10,000	$15,000	$30,000	$40,000	$40,000	$40,000	$16,000	$80,000	$110,000	$110,000	$110,000	$110,000	$160,000	$210,000	$210,000



DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	1998 1	2	3	4	5	6	7	8	9	10	11	12
TANK PAINTING & DISINFECTION	CONTRACT												
PROJECT MANAGEMENT	WATER CO.												
FIELD INSPECTION	WATER CO.												
CASH FORECAST		**$10,000**	**$10,000**	**$10,000**	**$50,000**	**$50,000**	**$50,000**	**$20,000**					

Kentucky-American Water Company

200 East Park Drive • Suite 600 • P.O. Box 1688 • Mt. Laurel, New Jersey 08054 • 609-778-0400

June 20, 1996

File No. 380-8362

KENTUCKY-AMERICAN WATER COMPANY
COMPLETION MEMORANDUM BP 91-01
CLAYS MILL GROUND STORAGE TANK

Reference: 1992 Least Cost/Comprehensive Planning Study - Project A-12; Budget Project Memorandum BP 90-10; Budget Project Memoranda BP 91-1 dated September 18, 1990; August 14, 1991; July 30, 1992; September 15, 1993; June 21, 1994; and August 26, 1994.

ESTIMATED COST SUMMARY

	Approved	Completed
Budget Estimated Cost	$3,119,000	$3,175,050

DISCUSSION

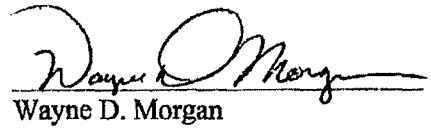
The project involved the acquisition of property, design and construction of a 3.0 million gallon concrete ground storage tank and booster station to improve service to southwestern portions of the distribution system. The pump station included two (2) 9 mgd pumps with variable speed drives and state-of-the art monitoring and controls.

The project was completed 1.8% ($56,050) over the approved budget. The major variance was due to AFUDC charges which exceeded the estimated amount by $46,000.

Kentucky-American Water Company
Revised BP 91-01
Clays Mill Ground Level Storage and Booster Facility
June 20, 1996

The major problem was due to delays involving the variable speed drive equipment supplied by Allen-Bradley Company, Inc. The equipment was originally scheduled for an October, 1995 delivery, but due to manufacturing delays, it was received late January, 1996.

The tank and booster station are in-service and performing well. The additional storage has helped meet the Public Service Commission's requirement for Kentucky-American to increase water storage capacity in accordance with the June, 1994 Finished Water Storage Analysis that was filed with the Commission. This facility also allows greater flexibility in the operation of both treatment plants, and added support during periods of high demand.



Wayne D. Morgan
Vice-President

WDM/sdb
6/20/96
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APPROVED AT BOARD OF DIRECTORS
MEETING ON OCTOBER 24, 1994

American Water Works Service Company, Inc.

1025 Laurel Oak Road • P. O. Box 1770 • Voorhees, New Jersey 08043 • (609) 346-8201

August 26,1994

File No. 380-8362

KENTUCKY-AMERICAN WATER COMPANY
REVISED CAPITAL BUDGET PROJECT 91-1
CLAYS MILL GROUND LEVEL STORAGE AND BOOSTER FACILITY

Reference: 1992 Least Cost/Comprehensive Planning Study (Project A-12); Budget Project Memorandum BP 90-10; and Budget Project Memoranda 91-1 dated September 18, 1990; August 14, 1991; July 30, 1992; September 15, 1993; and June 21, 1994.

Approved Estimated Cost	$2,695,000
Prior Expenditure	176,500
Budget 1994 Expenditure	132,000
Budget 1995 Expenditure	2,386,500
Revised Estimated Cost	$3,119,000
Actual Prior Expenditures	176,500
Revised 1994 Expenditure	132,000
Revised 1995 Expenditure	2,810,500

It is recommended that the budget be revised as indicated to reflect actual construction bids received, final design and bidding costs and the latest estimates of engineering, interest and other expenses during construction. Construction bids were received on August 18, 1994 and exceeded the estimated

BUDGET PROJECT REVIEW

DEPARTMENT	BY	DATE
ENGINEERING		8.29.94
WATER QUALITY		8/29/94
OTHER		

RECOMMENDED FOR APPROVAL:

9/12/94

PRESIDENT

construction cost included in the current budget by $400,000. Six (6) bids were received and were very competitive. The spread between the four (4) lowest bids received was less than 2% and the spread between the first and the second low bidders was 0.8%.

In reviewing the bids against the engineer's estimate, the largest discrepancy (almost $300,000) was the cost of the electrical and controls. System Engineering is reviewing this work scope and costs in detail to assure they are appropriate.

The water company is petitioning the Utility Commission for a Certificate of Necessity which would be received in time for a contract award in October. It is recommended that the budget be increased by approximately 15% to allow construction work to be completed as planned.

M. F. Whalen /SRS
Mercedes F. Whalen

S. P. Schmitt
Stephen P. Schmitt, P.E.

KENTUCKY-AMERICAN WATER COMPANY
CLAYS MILL GROUND LEVEL STORAGE AND BOOSTER FACILITY, BP 91-1

Cost Estimate

Item	Category	6/94 Estimate	8/94 Estimate
Tank Construction	Contract	$600,000	$570,000
Booster Construction	Contract	1,300,000	1,720,700
		$1,900,000	$2,290,700
Pipeline Construction	Contract	165,000	165,000
		$2,065,000	$2,455,700
Engineering Services			
Design-Consultant	Contract	70,000	63,000
Design Overview/Liaison-AWWS	Company	18,000	23,000
Pipeline Design & Bidding-Water Company	Company	10,000	10,000
Bidding Services - Consultant	Contract	6,500	6,500
Bidding Administration - AWWS	Company	5,000	7,000
Construction Technical Review Services-Consultant	Contract	35,000	35,000
Construction Administration-AWWS	Company	30,000	30,000
Resident Observation-Consultant	Contract	60,000	60,000
		$2,299,500	$2,690,200
Materials Testing	Contract	15,000	15,000
Permits	Company	2,000	2,000
Builder's Risk Insurance	Company	2,850	3,684
		$2,319,350	$2,710,884
Water Company Material & Labor		13,000	13,000
		$2,332,350	$2,723,884
Land Acquisition		175,000	175,000
		$2,507,350	$2,898,884
Omissions & Contingencies		103,300	122,785
		$2,610,650	$3,021,669
Interest		84,000	97,439
		$2,694,650	$3,119,108
	SAY	$2,695,000	$3,119,000

The estimated total project cost results in an average 1.85% rate increase for residential customers.

MFW/sdb
8/26/94
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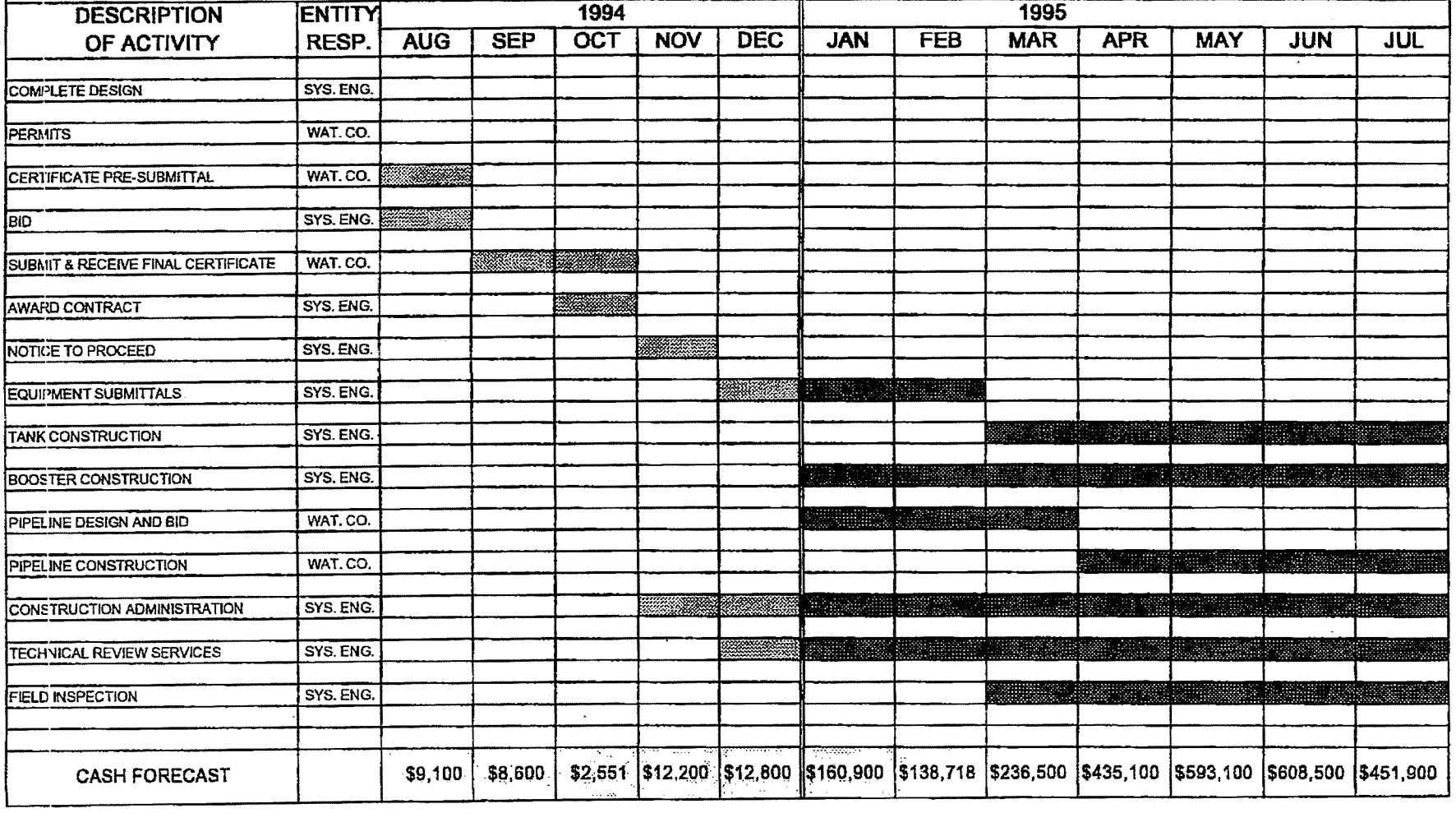
KENTUCKY-AMERICAN WATER COMPANY
CLAYS MILL GROUND LEVEL STORAGE AND BOOSTER FACILITY
REVISED BP 91-1
1994-1995



DESCRIPTION OF ACTIVITY	ENTITY RESP.	1994 AUG	SEP	OCT	NOV	DEC	1995 JAN	FEB	MAR	APR	MAY	JUN	JUL
COMPLETE DESIGN	SYS. ENG.												
PERMITS	WAT. CO.												
CERTIFICATE PRE-SUBMITTAL	WAT. CO.												
BID	SYS. ENG.												
SUBMIT & RECEIVE FINAL CERTIFICATE	WAT. CO.												
AWARD CONTRACT	SYS. ENG.												
NOTICE TO PROCEED	SYS. ENG.												
EQUIPMENT SUBMITTALS	SYS. ENG.												
TANK CONSTRUCTION	SYS. ENG.												
BOOSTER CONSTRUCTION	SYS. ENG.												
PIPELINE DESIGN AND BID	WAT. CO.												
PIPELINE CONSTRUCTION	WAT. CO.												
CONSTRUCTION ADMINISTRATION	SYS. ENG.												
TECHNICAL REVIEW SERVICES	SYS. ENG.												
FIELD INSPECTION	SYS. ENG.												
CASH FORECAST		$9,100	$8,600	$2,551	$12,200	$12,800	$160,900	$138,718	$236,500	$435,100	$593,100	$608,500	$451,900

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KENTUCKY-AMERICAN WATER COMPANY
CLAYS MILL GROUND LEVEL STORAGE AND BOOSTER FACILITY
REVISED BP 91-1
1994-1995

DESCRIPTION OF ACTIVITY	ENTITY RESP.	1995 AUG	SEP	OCT	NOV	DEC	1996 JAN	FEB	MAR	APR	MAY	JUN	JUL
TANK CONSTRUCTION	SYS. ENG.												
BOOSTER CONSTRUCTION	SYS. ENG.												
PIPELINE CONSTRUCTION	WAT. CO.												
START-UP, TESTING	SYS. ENG.												
SUBSTANTIAL COMPLETION	SYS. ENG.												
PUNCHLIST/FINAL COMPLETION	SYS. ENG.												
CONSTRUCTION ADMINISTRATION	SYS. ENG.												
TECHNICAL REVIEW SERVICES	SYS. ENG.												
CASH FORECAST		$165,782	$10,000	$5,000	$5,000								

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APPROVED AT BOARD OF DIRECTORS
MEETING JULY 25, 1994

American Water Works Service Company, Inc.

1025 Laurel Oak Road • P. O. Box 1770 • Voorhees, New Jersey 08043 • (609) 346-8201

June 21, 1994

File No. 380-8362

KENTUCKY-AMERICAN WATER COMPANY
REVISED CAPITAL BUDGET PROJECT 91-1
CLAYS MILL GROUND LEVEL STORAGE AND BOOSTER FACILITY

Reference: 1992 Least Cost/Comprehensive Planning Study (Project A-12); Budget Project Memorandum BP 90-10; and Budget Project Memoranda 91-1 dated September 18, 1990; August 14, 1991; July 30, 1992; and September 15, 1993.

Approved Estimated Cost	$2,235,000
Prior Expenditure	218,500
Budget 1994 Expenditure	782,500
Budget 1995 Expenditure	1,234,000
Revised Estimated Cost	$2,695,000
Actual Prior Expenditures	176,500
Revised 1994 Expenditure	132,000
Revised 1995 Expenditure	2,386,500

It is recommended that the budget be revised as indicated to reflect changes in the estimated project cost and cash flow. The original cost estimate is based on a conceptual design. During the detailed design, additional scope has been added to the project. An on-site lagoon has been provided to prevent the discharge of chlorinated water in accordance with the state regulations. The size of the booster station has been increased to allow for an expansion of the facility to a future 18 mgd capacity.

BUDGET PROJECT REVIEW

DEPARTMENT	BY	DATE
ENGINEERING		6.22.94
WATER QUALITY		6/24/94
OTHER		

RECOMMENDED FOR APPROVAL:

6/24/94

REGIONAL VICE PRESIDENT

Kentucky-American Water Company
Revised BP 91-1
Clays Mill Ground Level Storage and Booster Facility
June 21, 1994

Variable frequency drives have been added for greater flexibility in operations. In order to satisfy the requirements of adjacent property owners additional landscaping has been added and noise suppression has been installed on the standby generator. In addition, the original cost estimate is based on 1992/1993 construction costs, and it has been adjusted to reflect 1994/1995 construction costs.

The design is expected to be complete in June and a Pre-Submittal Certificate of Convenience and Necessity will be submitted. The Division of Water permit is expected in July and bids will be received in August. Upon receipt of bids, the Final Certificate will be submitted with a contract being awarded in October.

Hans E. Tuneblom

Stephen P. Schmitt, P.E.

KENTUCKY-AMERICAN WATER COMPANY
CLAYS MILL GROUND LEVEL STORAGE AND BOOSTER FACILITY, BP 91-1

DETAILED COST ESTIMATE

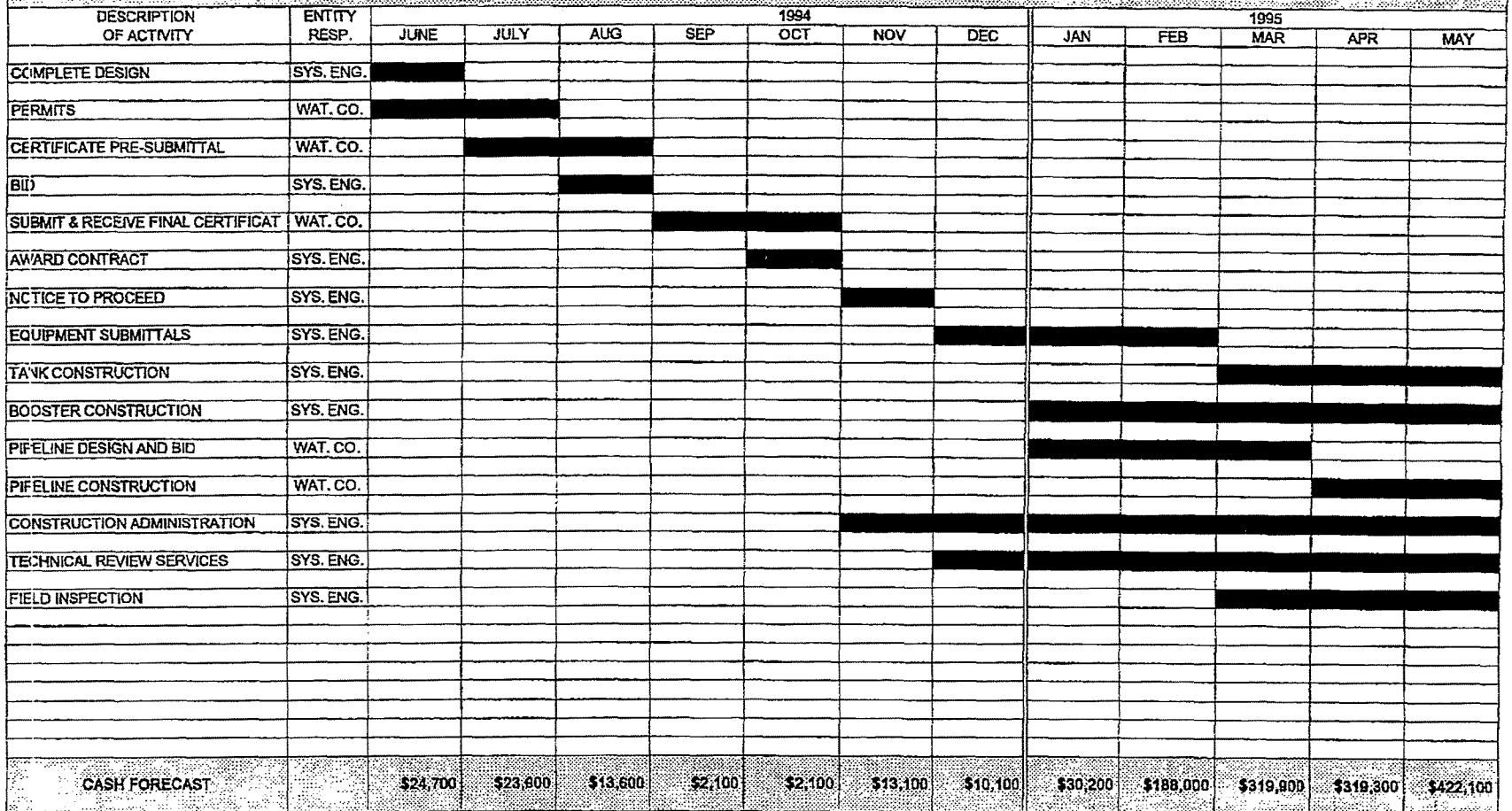
		Estimate 9/93	Estimate 6/94
Tank Construction	Contract	$900,000	$900,000
Booster Construction	Contract	465,000	1,000,000
		$1,365,000	$1,900,000
Pipeline Construction	Contract	165,000	165,000
		$1,530,000	$2,065,000
Engineering Services			
Design-Consultant	Contract	80,000	70,000
Design Overview-Liaison-AWWSC	Company	18,000	18,000
Pipeline Design & Bidding-KAWC	Company	10,000	10,000
Bidding Services-Consultant	Contract	5,000	6,500
Bidding Administration-AWWSC	Company	5,000	5,000
Construction Technical Review Services-Consultant	Contract	60,000	35,000
Construction Administration-AWWSC	Company	30,000	30,000
Resident Observation-Consultant	Contract	85,000	60,000
		$1,823,000	$2,299,500
Materials Testing	Contract	0	15,000
Permits	Company	2,000	2,000
Builder's Risk Insurance	Company	2,000	2,850
		$1,827,000	$2,319,350
Water Company Labor	Company	13,000	13,000
		$1,840,000	$2,332,350
Land Acquisition	Company	175,000	175,000
		$2,015,000	$2,507,350
Omissions & Contingencies		99,000	103,300
		$2,114,000	$2,610,650
Interest		121,000	84,000
		$2,235,000	$2,694,650
	SAY		$2,695,000

The estimated total project cost results in an average 1.61 percent rate increase for residential customers.

HET/sdb

4regbp

KENTUCKY-AMERICAN WATER COMPANY
CLAYS MILL GROUND LEVEL STORAGE AND BOOSTER FACILITY
REVISED BP 91-1
1994-1995



DESCRIPTION OF ACTIVITY	ENTITY RESP.	1994 JUNE	JULY	AUG	SEP	OCT	NOV	DEC	1995 JAN	FEB	MAR	APR	MAY
COMPLETE DESIGN	SYS. ENG.												
PERMITS	WAT. CO.												
CERTIFICATE PRE-SUBMITTAL	WAT. CO.												
BID	SYS. ENG.												
SUBMIT & RECEIVE FINAL CERTIFICAT	WAT. CO.												
AWARD CONTRACT	SYS. ENG.												
NOTICE TO PROCEED	SYS. ENG.												
EQUIPMENT SUBMITTALS	SYS. ENG.												
TANK CONSTRUCTION	SYS. ENG.												
BOOSTER CONSTRUCTION	SYS. ENG.												
PIPELINE DESIGN AND BID	WAT. CO.												
PIPELINE CONSTRUCTION	WAT. CO.												
CONSTRUCTION ADMINISTRATION	SYS. ENG.												
TECHNICAL REVIEW SERVICES	SYS. ENG.												
FIELD INSPECTION	SYS. ENG.												
CASH FORECAST		$24,700	$23,800	$13,600	$2,100	$2,100	$13,100	$10,100	$30,200	$188,000	$319,900	$319,300	$422,100

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KENTUCKY-AMERICAN WATER COMPANY
CLAYS MILL GROUND LEVEL STORAGE AND BOOSTER FACILITY
REVISED BP 91-1
1994-1995

DESCRIPTION OF ACTIVITY	ENTITY RESP.	1995 JUNE	JULY	AUG	SEP	OCT	NOV	DEC	1996 JAN	FEB	MAR	APR	MAY
TANK CONSTRUCTION	SYS. ENG.												
BOOSTER CONSTRUCTION	SYS. ENG.												
PIPELINE CONSTRUCTION	WAT. CO.												
START-UP, TESTING	SYS. ENG.												
SUBSTANTIAL COMPLETION	SYS. ENG.												
PUNCHLIST/FINAL COMPLETION	SYS. ENG.												
CONSTRUCTION ADMINISTRATION	SYS. ENG.												
TECHNICAL REVIEW SERVICES	SYS. ENG.												
CASH FORECAST		$405,200	$365,100	$316,700	$10,000	$5,000	$5,000						

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American Water Works Service Company, Inc.

1025 Laurel Oak Road • P.O. Box 1770 • Voorhees, New Jersey 08043 • (609) 346-8201

September 18, 1990

File No. 380-8362

KENTUCKY-AMERICAN WATER COMPANY
PROPOSED CAPITAL BUDGET PROJECT, BP 91-1
DESIGN CLAYS MILL GROUND LEVEL STORAGE AND
BOOSTER FACILITY

Reference: 1986 Least Cost/Comprehensive Planning Study (Project B-4), and Budget Project Memorandum 90-10

SUBJECT

Design of a 3.0 million gallon ground level storage and booster station.

RECOMMENDATION

It is recommended that funds be authorized to design a 3.0 MG ground level storage facility and booster station to be located in the southwestern section of the Kentucky-American system, in the vicinity of Clays Mill Road and Brannon Road.

ESTIMATED COST

Total Estimated Cost	$100,000
Proposed 1991 Expenditure (Design)	$100,000

URGENCY

The proposed tank is needed to meet the equalization, fire protection and reliability needs in the growing southern Fayette County area. It will also help the entire Kentucky-American system maintain the hydraulic gradient necessary to reliably meet the system's peak demands.

BUDGET PROJECT REVIEW

DEPARTMENT	BY	DATE
ENGINEERING		9/19/90
WATER QUALITY		9/19/90
OTHER		

RECOMMENDED FOR APPROVAL:

SYSTEM COMPANY PRESIDENT

Kentucky-American Water Co.
Proposed Capital Budget Project
Design Clays Mill Ground Level
Storage and Booster Facility

ADEQUACY

The recommended project will be adequate to allow permitting and receipt of construction bids so that funds can be requested for construction during 1992-1993.

Anticipated 1991 Design Foecast

February	$ 2,000
March	3,000
April	10,000
May	15,000
June	15,000
July	15,000
August	15,000
September	10,000
October	5,000
November	5,000
December	5,000

Forecast represents a project bill schedule and should be adjusted for cash expenditures.

Kentucky-American Water Co.
Proposed Capital Budget Project
Design Clays Mill Ground Level
Storage and Booster Facility

DISCUSSION

During high demand periods, areas of southern Fayette County, in the southern and western portions of the KAWC service area, have experienced low pressure problems. The situation was most widespread during early June, 1988 when KAWC experienced record customer demands. Since 1988, the area has continued to undergo significant growth. If a similar demand were to occur again, the consequences in this area would be more severe.

The proposed tank, in conjunction with the proposed Jack's Creek (BP 90-15) and Brannon Road (BP 90-7) pipelines will provide improved service to this growing area of the system. Also, it will provide benefit to the overall system by allowing the system to operate at higher and more stable pressures during peak demand conditions.

The Kentucky Public Service Commission has recommended that Kentucky-American increase the amount of distribution storage volume available, for reliability purposes. The proposed tank will increase the overall distribution system storage volume in the Kentucky-American system by twenty-three percent, from 12.8 MG to 15.8 MG.

Gary A. Naumick

Gary A. Naumick, P.E.

JSY/cld

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 3

Witness: Linda C. Bridwell

3. For each Kentucky-American storage facility, provide its name, street address, latitude and longitude, and the pressure zone. Identify each ground level storage tank that has a backup power source.

RESPONSE:

Please refer to Exhibit No. 1 on pages 2 & 3 of the Kentucky American Water Company "Storage Capacity Analysis" dated December 21, 2005 and previously filed in this case. The street address and longitude and latitude are as follows:

Tank	Pressure	Street Address	Longitude	Latitude	Backup Power if Ground
Clays Mill Road Tank Ground	Main	4400 Clays Mill Road, Lexington	W84d34'11"	N37d58'32"	Yes
Clays Mill Road Tank Ground 2	Main	4400 Clays Mill Road, Lexington	W84d34'11"	N37d58'32"	Yes
Cox Street Ground	Main	196 Cox St, Lexington	W84d30'30"	N38d3'5"	No
Cox Street Elevated	Main	196 Cox St, Lexington	W84d30'30"	N38d3'5"	N/A
Mercer Road Elevated	Main	1680 Mercer Rd, Lexington	W84d31'33"	N38d4'31"	N/A

Parkers Mill Ground Storage Tank	Main	2095 Parkers Mill Road, Lexington	W84d34'16"	N38d2'8"	Yes
York Street Ground Storage Tank	Main	124 York Street	W84d28'57"	N38d3'20"	No
Hume Road Ground Storage Tank	Main	1500 Hume Road, Lexington	W84d25'50"	N38d3'28"	Yes
Eastland Elevated Storage Tank	Main	1210 Eastland Dr, Lexington	W84d27'37"	N38d2'45"	N/A
Tates Creek Elevated Storge Tank	Main	Alumni Drive, Lexington	W84d30'10"	N38d0'53"	N/A
Russell Cave Road Ground Storage Tank	High	7390 Russell Cave Road, Lexington	W84d23'28"	N3812'25"	Yes
Sadieville Standpipe	Sadieville	Cunningham Avenue, Sadieville	W84d32'26"	N38d23'12"	N/A
Hall Tank Standpipe	High	US 25 North of Rogers Gap Road, Scott County	W84d33'38"	N38d18'36"	N/A
Muddy Ford Elevated Storage Tank	High	Gunnell Road, Scott County	W84d30'16"	N38d17'23"	N/A
Briar Hill Elevated Tank	High	Briar Hill Road, Bourbon County	W84d17'54"	N38d4'56"	N/A

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 4

Witness: Linda C. Bridwell

4. For each storage facility that Kentucky-American intended to construct by 2005, state the name of the facility and state the date that the facility was placed into service. If the facility has yet to be placed into service, state when the facility will be placed into service.

RESPONSE:

In the 1993 storage analysis, Kentucky American Water proposed to construct five storage tanks:

	1993 Proposed tank	Name of tank constructed	Size	Date in Service
1	3.0 MG Pumped Storage Clays Mill Road	Clays Mill Road 3.0 MG ground storage tank	3.0 MG	1994
2	3.0 MG Pumped Storage Tank, Hume Road	Eastland Elevated Tank	2.0 MG	2005
3	.75 MG Elevated Tank, Avon	Briar Hill Road elevated tank	0.75 MG	1998
4	1.0 MG Pumped Storage Facility, Russell Cave	Russell Cave Road tank	1.0 MG	2005
5	3.0 MG Pumped Storage Facility – Clays Mill Road	Clays Mill Road second tank	3.0 MG	2004

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 5

Witness: Linda C. Bridwell

5. Identify each ground level storage facility and state whether the facility has an emergency power source to permit its continued operation during electrical power outages.

RESPONSE

Please refer to the response to Item 3 of this same data request.

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 6

Witness: Linda C. Bridwell

6. State whether Kentucky-American included the storage capacity of any ground level storage facility that lacks an emergency power source in its calculations of available storage capacity in its available storage capacity calculations. If yes, explain why Kentucky-American included this capacity in its available storage capacity analysis calculation.

RESPONSE:

Yes. Both the Cox Street Ground Storage Tank (1.0 MG) and the York Street Ground Storage Tank (1.0 MG) were included in the available storage capacity calculations although they do not have specific emergency power back-up at the facilities. They were included because each facility is on a separate power supply and each facility is served by separate electrical substations. With a community the size of Lexington it would be extremely unlikely that an electrical power outage would cover the entire area and if power were lost at both treatment plants simultaneously there would be power available at some, if not all, of the tank facilities. This occurred during the 2004 ice storm which saw widespread power outages throughout but not entirely covering Lexington. If these two facilities were removed from the calculations there is still a storage surplus based on 50% storage in the main service gradient.

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 7

Witness: Linda C. Bridwell

7. Other comparably sized water distribution systems in Kentucky (e.g., Louisville Water Company, Northern Kentucky Water District, Frankfort Electric and Water Plant Board) have water storage capacity in excess of the average daily consumption. Explain why Kentucky-American requests deviation to a capacity that is below this level.

RESPONSE:

Every utility must evaluate the appropriate level of storage based on reliability, fire protection, equalization, water quality, general operations, and cost of storage or alternative measures. For systems which only have one source of water supply, having a level of storage equal to or even greater than one average day of demand may be appropriate for reliability purposes. For systems that have more than one source, but limited reliability in those sources, again having a level of storage equal to or even greater than one average day of demand may be appropriate. Specific geographic areas within a system may have limited feed and system reliability, and may require more storage than other areas. Additional volumes of storage, while providing greater system reliability, also present operational challenges of water quality concerns as well as cost to the customer. Kentucky American Water has undertaken an extensive and detailed analysis of its storage balanced against the criteria listed above and believes that a deviation is in the overall best interests of its customers.

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 8

Witness: Linda C. Bridwell

8. List and describe any discussions with local fire departments that Kentucky-American officials have had since January 1, 1994 regarding fire flow storage needs in Kentucky-American's service territory.

RESPONSE:

Although Kentucky-American Water has regular discussions with local fire departments on a number of issues, to our knowledge Kentucky American officials have not had any discussions with local fire departments since January 1, 1994 regarding fire flow storage needs in Kentucky-American's service territory.

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 9

Witness: Linda C. Bridwell

9. Provide all correspondence with local fire departments that Kentucky American officials since January 1, 1994 have had regarding fire flow storage needs in Kentucky-American's service territory.

RESPONSE:

There is no correspondence.

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 10

Witness: Linda C. Bridwell

10. Provide all correspondence between Kentucky-American and the Insurance Services Office regarding the needed fire flow volumes for each of the pressure zones in Kentucky-American's service area.

RESPONSE:

There has been no correspondence between Kentucky American Water and the Insurance Service Office regarding the needed fire flow volumes.

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 11

Witness: Linda C. Bridwell

11. Provide all studies, reports, statements and other documents from the Insurance Services Office that discuss the needed fire flow volumes for each pressure zone in Kentucky-American's service area.

RESPONSE:

Please see attached.

INSURANCE SERVICES OFFICE, INC.
4 B EVES DRIVE SUITE 200 MARLTON, NJ 08053 (609) 985-5600 FAX (609) 985-6464

December 18,1998

William R Holleran
Fire Chief
Lexington Zone 1, 2 & 3 FD's
219 E Third St
Lexington, KY 40508

RE: ISO's COMMUNITY OUTREACH PROGRAM

Dear Chief Holleran

We wish to thank those involved in responding to our recent inquiry. We have completed our evaluation of the submitted information and confirmed that your current classification continues to apply.

The purpose of gathering this information is to determine a fire insurance classification which may be used in the calculation of property insurance premiums. The information collected is not for property loss prevention or life safety purposes and no life safety or property loss prevention recommendations will be made.

Please provide us with any future updates as they occur, including:

- Changes in Fire Station Locations
- New Fire Stations
- Changes in Boundaries

We appreciate your assistance in keeping our fire protection information for your community current.

Sincerely,

Lorraine Stammerjohann

Lorraine Stammerjohann
Community Outreach Program

cc: Honorable Scotty Baesler, Mayor

ISO Public Protection Information Update Form

Water Supply

1. Does your area have fire hydrants connected to a water system? ☒ Yes ☐ No
   If yes, who owns the hydrants and water system: Kentucky-American Water Company

2. Does your area have dry fire hydrants or suction points? ☐ Yes ☒ No
   If yes, please provide an address list of these locations or plot them on the enclosed map.

3. How often are fire hydrants inspected? Annually

4. Describe any major changes to the water system(s) in the past 5 years:
   1. 12,450' of 24" main installed in south end of Lexington
   2. Clays Mill Road tank installed
   3. 3,450' of 16" main installed on Harrodsburg Road

5. Please provide the results of any Hydrant Flow Tests in the past 5 years.
   Hydrant Flow Tests enclosed ? ☐ Yes ☒ No

6. Please provide a current community Hydrant Map.
   Hydrant Map enclosed? ☐ Yes ☒ No

   If you cannot provide a Hydrant Map or Flow Test results but can refer us to the individual in your community who could provide this information, please note their name below.
   Hydrant Map can be obtained from: Ed Blankenship - Kentucky American Water Company
   Telephone Number: (606) 268-6355

SURVEY COMPLETED BY: Harold McKune Harold McKune

Title: Assistant Chief Phone: (606) 231 - 5679

Date Completed: 11 / 03 / 98

Please return survey in the enclosed envelope to:

PPC Coordinator
Insurance Services Office, Inc.
111 North Canal Street, Suite 950
Chicago, IL 60606-7270

OR

PPC Coordinator
Insurance Services Office, Inc.
4B Eves Drive, Suite 200
Marlton, NJ 08053-3112

ISO COMMERCIAL RISK SERVICES, INC.
7000 EXECUTIVE CENTER DRIVE SUITE 220 BRENTWOOD, TN 37027 (615) 377-3960

February 18, 1985

Mr. Scotty Baesler, Mayor
City of Lexington
136 Walnut Street
Lexington, Kentucky 40507

Dear Mayor Baesler:

We wish to thank you, Chief McDaniel, Chief Caton, Mr. Rice, and others for the cooperation given to our representatives during our recent survey. We have completed our evaluation of the fire insurance classification for Lexington-Fayette County and wish to confirm that Class 3 continues to apply in Zone 1 and can advise that the classification has improved to Class 3/9 in Zones 2 and 3 from the previously assigned Class 5/9.

The new classification will be effective as of March 1, 1985.

The purpose of our visit was to gather information needed to determine a fire insurance classification which may be used to develop fire insurance costs. The survey was not conducted for property loss prevention or life safety purposes and no life safety or property loss prevention recommendations are, or will be, made.

For applicable loss cost changes, consult with a local insurance agent.

The city classification applies to properties having a needed fire flow of 3500 gpm or less. The private and public protection at properties having larger needed fire flows are individually evaluated and may vary from the city classification.

We are attaching a copy of the Grading Sheet and the results of the hydrant flow tests witnessed during our survey. Extra copies of this letter and attachments are enclosed so that you may distribute them to other interested parties, if you desire to do so.

If you have any questions concerning our survey and grading, please let us know.

Very truly yours,

Dale A. Green

Dale A. Green, CPCU
Field Rating Representative
Public Protection

dag:pr

cc: CRS/Home
CRS/Atlanta
CRS/Kentucky
Earl R. McDaniel, Chief
Gary Rice, Ky-Am Water Co.

ISO COMMERCIAL RISK SERVICES, INC.
7000 EXECUTIVE CENTER DRIVE SUITE 220 BRENTWOOD, TN 37027 (615) 377-3960

Grading Sheet for Lexington-Fayette Co., KY

Public Protection Class: 3/9 Surveyed: June, 1984

Feature	Credit Assigned	Maximum Credit
Receiving and Handling Fire Alarms...	7.45%	10.00%
Fire Department.....	39.53%	50.00%
Water Supply.....	31.93%	40.00%
*Divergence.....	-0.16%	
Total Credit	78.75%	100.00%

The Public Protection Class is based on the total percentage credit as follows:

Class	%
1	90.00 or more
2	80.00 to 89.99
3	70.00 to 79.99
4	60.00 to 69.99
5	50.00 to 59.99
6	40.00 to 49.99
7	30.00 to 39.99
8	20.00 to 29.99
9	10.00 to 19.99
10	0 to 9.99

*Divergence is a reduction in credit to reflect a difference in the relative credits for Fire Department and Water Supply.

The above classification has been developed for fire insurance rating purposes only.

ISO COMMERCIAL RISK SERVICES, INC.

HYDRANT FLOW DATA SUMMARY

City Lexington State Kentucky Zip 40507 Witnessed by EG Date 6-18-84

TEST NO.	TYPE DIST.*	TEST LOCATION	SERVICE	FLOW-GPM INDIVIDUAL HYDRANTS			FLOW-GPM TOTAL	PRESSURE PSI STATIC	PRESSURE PSI RESID.	FLOW AT 20 PSI NEEDED **	FLOW AT 20 PSI AVAIL.	REMARKS
1	Comm	Loudon & No. Limestone	Main	1200	1750		2950	66	48	8000	4900	
2	Comm	New Circle Rd.	Main	2030			2030	75	62	3500	4400	
3	Comm	Eastin & Brookmeade Dr.	Main	870	1430		2290	43	27	3000	2800	
4	Comm	Northern Pkwy. & Judy Ln.	Main	1570			1570	49	27	4500	1800	
5	Res	Pierson & Burgoyne Ct.	Main	1430			1430	69	35	1000	1700	
6	Comm	Winburn Dr.	Main	870			870	44	33	3500	1300	
7	Comm	Stanton Way	Main	1570			1570	68	42	3500	2200	
8	Comm	Nandino Blvd.	Main	2260			2260	57	47	1000	4600	
9	Comm	Sandersville Rd.	Main	2030			2030	70	55	3500	3900	
10	Comm	Baumann Dr.	Main	2030			2030	57	41	4500	3200	
11	Comm	Buck Lane	Main	2120			2120	72	50	3000	3400	
12	Comm	Leestown & Greendale Rd.	Main	1750	1050		2800	75	61	3000	5900	
13	Comm	Lisle Rd.	Main	2350			2350	87	75	7000	5900	
14	Comm	Liggett	Main	1430			1430	42	2	7000	1000	
15	Comm	Manchester St.	Main	970	2260		3230	48	33	6000	4500	
16	Comm	W. 4th & Blackburn	Main	1050	1280		2330	32	20	3500	2300	

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR INSURANCE RATING PURPOSES ONLY AND ARE NOT INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION. THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

*Comm = Commercial; Res = Residential.

**Needed is the rate of flow for a specific duration for a full credit condition. Needed Fire Flows greater than 3,500 gpm are not considered in determining the classification of the city when using the Fire Suppression Rating Schedule.

ISO COMMERCIAL RISK SERVICES, INC.

HYDRANT FLOW DATA SUMMARY

City Lexington State Kentucky Zip 40507 Witnessed by E/G Date 6-18-84

TEST NO.	TYPE DIST.*	TEST LOCATION	SERVICE	FLOW-GPM INDIVIDUAL HYDRANTS			FLOW-GPM TOTAL	PRESSURE PSI STATIC	PRESSURE PSI RESID.	FLOW AT 20 PSI NEEDED **	FLOW AT 20 PSI AVAIL.	REMARKS
17	Comm	Short & Mill Sts.	Main	1050	1570		2620	71	61	3500	6300	
18	Comm	Maxwell & S. Limestone	Main	750	550		1300	64	55	3500	3100	
19	Comm	S. Broadway	Main	1570	550		2120	24	15	7500	1400	
20	Comm	S. Broadway & Montmullin	Main	2260			2260	23	11	7000	1100	
21	Comm	Angliana Ave.	Main	2030			2030	26	7	7500	1100	
22	Comm	Versailles Pike	Main	2170			2170	31	20	7000	2200	
23	Comm	Forbes & Unity	Main	2260			2260	37	15	2500	2000	
24	Comm	W. Virginia	Main	1500	2220		3720	62	44	7500	5900	
25	Comm	Alexandria Dr.	Main	2390			2390	71	55	3500	4500	
26	Comm	Alexandria Dr.	Main	2600			2600	92	82	2000	7500	
27	Comm	Georgian Way	Main	2080			2080	62	47	3500	3600	
28	Comm	Reedlane Dr.	Main	2030			2030	67	46	4500	3100	
29	Comm	Nicholasville	Main	1920			1920	63	48	4000	3400	
30	Comm	Zandale & Crestwood	Main	2170			2170	58	46	3500	4000	
31	Comm	Gold Rush Dr.	Main	1870			1870	69	42	4000	2600	
32	Res	Spring Run Rd.	Main	1570			1570	72	17	1000	1500	

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR INSURANCE RATING PURPOSES ONLY AND ARE NOT INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION. THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

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**Needed is the rate of flow for a specific duration for a full credit condition. Needed Fire Flows greater than 3,500 gpm are not considered in determining the classification of the city when using the Fire Suppression Rating Schedule.

ISO COMMERCIAL RISK SERVICES, INC.

HYDRANT FLOW DATA SUMMARY

City Lexington State KY Zip 40507 Witnessed by E/G Date 6-18-84

TEST NO.	TYPE DIST.*	TEST LOCATION	SERVICE	FLOW-GPM INDIVIDUAL HYDRANTS			FLOW-GPM TOTAL	PRESSURE PSI STATIC	PRESSURE PSI RESID.	FLOW AT 20 PSI NEEDED **	FLOW AT 20 PSI AVAIL.	REMARKS
33	Comm	Wilson Downing Rd.	Main	2130	2130		4260	77	43	3500	5600	
34	Comm	Centre Pkwy & Centurian	Main	2390			2390	69	64	4000	2600	
35	Comm	Tates Creek Pk & Mt. Tabor	Main	1640	970		2610	106	91	2500	6700	
36	Comm	Euclid & Clay Ave.	Main	2030			2030	57	46	2000	3900	
37	Comm	Fontaine Dr.	Main	2220			2220	60	49	4500	4500	
38	Res	Cove Lake Dr.	Main	2390			2390	84	72	750	5900	
39	Comm	Woodhill & Mulberry	Main	2220			2220	73	62	4000	5200	
40	Comm	Palumbo	Main	2170			2170	66	58	5500	5600	
41	Comm	Eastland Pkwy & Charleston	Main	2260			2260	65	45	3500	2300	
42	Comm	New Circle & Floyd Dr.	Main	1010			1010	58	47	3500	2000	
43	Comm	Eastland Dr.	Main	1640	1430		3070	39	24	5000	3500	
44	Comm	Winchester & Detroit	Main	1570	1750		3320	45	33	1500	4900	

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR INSURANCE RATING PURPOSES ONLY AND ARE NOT INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION. THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

*Comm = Commercial; Res = Residential.

**Needed is the rate of flow for a specific duration for a full credit condition. Needed Fire Flows greater than 3,500 gpm are not considered in determining the classification of the city when using the Fire Suppression Rating Schedule.

ISO COMMERCIAL RISK SERVICES, INC.
7000 EXECUTIVE CENTER DRIVE SUITE 220 BRENTWOOD, TN 37027 (615) 377-3880

February 18, 1986

Mr. Scotty Baesler, Mayor
Lexington-Fayette Urban County Government
136 Walnut Street
Lexington, Kentucky 40507

Dear Mayor Baesler:

We wish to thank you, Chief McDaniel, and others for the cooperation given to our representative during our recent survey. We have completed our evaluation of your City and can advise that the classification for Zone 1 has improved to Class 2 from the previously assigned Class 3. The classification for Zones 2 and 3 has improved to Class 2/9 from the previously assigned Class 3/9.

The new classification will be effective as of March 1, 1986.

The purpose of our visit was to gather information needed to determine a fire insurance classification which may be used to develop fire insurance costs. The survey was not conducted for property loss prevention or life safety purposes and no life safety or property loss prevention recommendations are, or will be, made.

For applicable loss cost changes, consult with a local insurance agent.

The city classification applies to properties having a needed fire flow of 3500 gpm or less. The private and public protection at properties having larger needed fire flows are individually evaluated and may vary from the city classification.

We are attaching a copy of the Grading Sheet and the results of the hydrant flow tests witnessed during our survey. Extra copies of this letter and attachments are enclosed so that you may distribute them to other interested parties, if you desire to do so.

If you have any questions concerning our survey and grading, please let us know.

Very truly yours,

Dale A. Green

Dale A. Green, CPCU
Field Rating Representative
Public Protection

dag:pr
cc: Mark Lowry, Risk Mgr.
CRS/Home
CRS/AOC
Karl R. McDaniel, Chief
Gary Rice, Ky-Am Water Co.

ISO COMMERCIAL RISK SERVICES, INC.
7000 EXECUTIVE CENTER DRIVE SUITE 220 BRENTWOOD, TN 37027 (615) 377-3960

Grading Sheet for Lexington-Fayette Urban Co. Government

Public Protection Class: 2 (Zone 1) Surveyed: December, 1985
2/9 (Zone 2 & 3)

Feature	Credit Assigned	Maximum Credit
Receiving and Handling Fire Alarms...	9.15%	10.00%
Fire Department.....	39.40%	50.00%
Water Supply.....	33.04%	40.00%
*Divergence.....	-0.76%	
Total Credit	80.83%	100.00%

The Public Protection Class is based on the total percentage credit as follows:

Class	%
1	90.00 or more
2	80.00 to 89.99
3	70.00 to 79.99
4	60.00 to 69.99
5	50.00 to 59.99
6	40.00 to 49.99
7	30.00 to 39.99
8	20.00 to 29.99
9	10.00 to 19.99
10	0 to 9.99

*Divergence is a reduction in credit to reflect a difference in the relative credits for Fire Department and Water Supply.

The above classification has been developed for fire insurance rating purposes only.

ISO COMMERCIAL RISK SERVICES, INC.

HYDRANT FLOW DATA SUMMARY

City Lexington State Kentucky Zip 40507 Witnessed by EG Date 6-18-84

TEST NO.	TYPE DIST.*	TEST LOCATION	SERVICE	FLOW-GPM				PRESSURE PSI		FLOW AT 20 PSI		REMARKS
				INDIVIDUAL HYDRANTS			TOTAL	STATIC	RESID.	NEEDED **	AVAIL.	
1	Comm	Loudon & No. Limestone	Main	1200	1750		2950	66	48	8000	4900	
2	Comm	New Circle Rd.	Main	2030			2030	75	62	3500	4400	
3	Comm	Eastin & Brookmeade Dr.	Main	870	1430		2290	43	27	3000	2800	
4	Comm	Northern Pkwy. & Judy Ln.	Main	1570			1570	49	27	4500	1800	
5	Res	Pierson & Burgoyne Ct.	Main	1430			1430	69	35	1000	1700	
6	Comm	Winburn Dr.	Main	870			870	44	33	3500	1300	
7	Comm	Stanton Way	Main	1570			1570	68	42	3500	2200	
8	Comm	Nandino Blvd.	Main	2260			2260	57	47	1000	4600	
9	Comm	Sandersville Rd.	Main	2030			2030	70	55	3500	3900	
10	Comm	Baumann Dr.	Main	2030			2030	57	41	4500	3200	
11	Comm	Buck Lane	Main	2120			2120	72	50	3000	3400	
12	Comm	Leestown & Greendale Rd.	Main	1750	1050		2800	75	61	3000	5900	
13	Comm	Lisle Rd.	Main	2350			2350	87	75	7000	5900	
14	Comm	Liggett	Main	1430			1430	42	2	7000	1000	
15	Comm	Manchester St.	Main	970	2260		3230	48	33	6000	4500	
16	Comm	W. 4th & Blackburn	Main	1050	1280		2330	32	20	3500	2300	

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR INSURANCE RATING PURPOSES ONLY AND ARE NOT INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION. THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

*Comm = Commercial; Res = Residential.

**Needed is the rate of flow for a specific duration for a full credit condition. Needed Fire Flows greater than 3,500 gpm are not considered in determining the classification of the city when using the Fire Suppression Rating Schedule.

ISO COMMERCIAL RISK SERVICES, INC.

HYDRANT FLOW DATA SUMMARY

City Lexington State Kentucky Zip 40507 Witnessed by E/G Date 6-18-84 & 5-8-8

TEST NO.	TYPE DIST.*	TEST LOCATION	SERVICE	FLOW-GPM INDIVIDUAL HYDRANTS			FLOW-GPM TOTAL	PRESSURE PSI STATIC	PRESSURE PSI RESID.	FLOW AT 20 PSI NEEDED **	FLOW AT 20 PSI AVAIL.	REMARKS
17	Comm	Short & Mill Sts.	Main	1050	1570		2620	71	61	3500	6300	
18	Comm	Maxwell & S. Limestone	Main	750	550		1300	64	55	3500	3100	
19	Comm	S. Broadway	Main	1570	1640		3210	72	45	7500	4600	5-8-85
20	Comm	S. Broadway & Montmullin	Main	2480			2480	67	57	7000	5700	5-8-85
21	Comm	Angliana Ave.	Main	2260			2260	59	54	7500	6800	5-8-85
22	Comm	Versailles Pike	Main	2170			2170	31	20	7000	2200	
23	Comm	Forbes & Unity	Main	2260			2260	37	15	2500	2000	
24	Comm	W. Virginia	Main	1500	2220		3720	62	44	7500	5900	
25	Comm	Alexandria Dr.	Main	2390			2390	71	55	3500	4500	
26	Comm	Alexandria Dr.	Main	2600			2600	92	82	2000	7500	
27	Comm	Georgian Way	Main	2080			2080	62	47	3500	3600	
28	Comm	Reedlane Dr.	Main	2030			2030	67	46	4500	3100	
29	Comm	Nicholasville	Main	1920			1920	63	48	4000	3400	
30	Comm	Zandale & Crestwood	Main	2170			2170	58	46	3500	4000	
31	Comm	Gold Rush Dr.	Main	1870			1870	69	42	4000	2600	
32	Res	Spring Run Rd.	Main	1570			1570	72	17	1000	1500	

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR INSURANCE RATING PURPOSES ONLY AND ARE NOT INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION. THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

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ISO COMMERCIAL RISK SERVICES, INC.

HYDRANT FLOW DATA SUMMARY

City Lexington State KY Zip 40507 Witnessed by E/G Date 6-18-84

TEST NO.	TYPE DIST.*	TEST LOCATION	SERVICE	FLOW-GPM INDIVIDUAL HYDRANTS			FLOW-GPM TOTAL	PRESSURE PSI STATIC	PRESSURE PSI RESID.	FLOW AT 20 PSI NEEDED **	FLOW AT 20 PSI AVAIL.	REMARKS
33	Comm	Wilson Downing Rd.	Main	2130	2130		4260	77	43	3500	5600	
34	Comm	Centre Pkwy & Centurian	Main	2390			2390	69	64	4000	2600	
35	Comm	Tates Creek Pk & Mt. Tabor	Main	1640	970		2610	106	91	2500	6700	
36	Comm	Euclid & Clay Ave.	Main	2030			2030	57	46	1500	3900	
37	Comm	Fontaine Dr.	Main	2220			2220	60	49	4500	4500	
38	Res	Cove Lake Dr.	Main	2390			2390	84	72	750	5900	
39	Comm	Woodhill & Mulberry	Main	2220			2220	73	62	4000	5200	
40	Comm	Palumbo	Main	2170			2170	66	58	5500	5600	
41	Comm	Eastland Pkwy & Charleston	Main	2260			2260	65	45	3500	2300	
42	Comm	New Circle & Floyd Dr.	Main	1010			1010	58	47	3500	2000	
43	Comm	Eastland Dr.	Main	1640	1430		3070	39	24	5000	3500	
44	Comm	Winchester & Detroit	Main	1570	1750		3320	45	33	1500	4900	

THE ABOVE LISTED NEEDED FIRE FLOWS ARE FOR INSURANCE RATING PURPOSES ONLY AND ARE NOT INTENDED TO PREDICT THE MAXIMUM AMOUNT OF WATER REQUIRED FOR A LARGE SCALE FIRE CONDITION. THE AVAILABLE FLOWS ONLY INDICATE THE CONDITIONS THAT EXISTED AT THE TIME AND AT THE LOCATION WHERE TESTS WERE WITNESSED.

*Comm = Commercial; Res = Residential.

**Needed is the rate of flow for a specific duration for a full credit condition. Needed Fire Flows greater than 3,500 gpm are not considered in determining the classification of the city when using the Fire Suppression Rating Schedule.

Jim

Insurance Services Office

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, KENTUCKY
FIRE PROTECTION ZONE 1 *
(See Report Dated July, 1975)

...NO.	POPULATION	SURVEYED
44	160,000	November, 197

	WATER SUPPLY	FIRE DEPT.	FIRE SERV. COMM.	FIRE SAFETY CONTROL	CLIM. COND.	Divergence	TOTAL POINTS	CLASS
Points of Deficiency	370	279	147	256	16	0	1068	3

THE CLASS OF A MUNICIPALITY IS BASED ON A TOTAL MAXIMUM OF 5000 POINTS OF DEFICIENCY AS FOLLOWS:

1ST CLASS, 0 TO 500 POINTS
2ND CLASS, 501 TO 1000
3RD CLASS, 1001 TO 1500
4TH CLASS, 1501 TO 2000
5TH CLASS, 2001 TO 2500
6TH CLASS, 2501 TO 3000
7TH CLASS, 3001 TO 3500
8TH CLASS, 3501 TO 4000
9TH CLASS, 4000 TO 4500
10TH CLASS, OVER 4500

RELATIVE VALUES

	POINTS
WATER SUPPLY	1950
FIRE DEPARTMENT	1950
FIRE SERVICE COMMUNICATIONS	450
FIRE SAFETY CONTROL	650
	5000

...DITIONAL POINTS OF DEFICIENCY ARE APPLIED UNDER CLIMATIC CONDITIONS WHERE THESE ARE ...SS OF THE NORMAL FOR THE UNITED STATES, AND UNDER DIVERGENCE WHERE THE GRADINGS OF ...UPPLY AND FIRE DEPARTMENT ARE GREATLY DIFFERENT.

* Fire Protection Zones are defined by Lexington-Fayette Urban County Government Ordinance 73-74.

INSURANCE SERVICES OFFICE
OF KENTUCKY

P.O. BOX 7980, LOUISVILLE, KENTUCKY 40207
TELEPHONE: (502) 423-0220

D. SMITH, MANAGER

Lexington-Fayette Urban County Government, Kentucky

Grading Sheet for Fire Protection Zones 2 & 3 *

Class: 5

Surveyed: Nov. 1974; May 1975

Points of deficiency: 2,167

Water Supply	926
Fire Department	535
Fire Service Communications	208
Fire Safety Control	482
Additional Deficiencies	16

The class is based on the total number of points as follows:

Class	Points
1	0 - 500
2	501 - 1000
3	1001 - 1500
4	1501 - 2000
5	2001 - 2500
6	2501 - 3000
7	3001 - 3500
8	3501 - 4000
9	4001 - 4500
10	4501 - 5000

The relative values of the features of the grading are as follows:

Features	Points
Water Supply	1950
Fire Department	1950
Fire Service Communications	450
Fire Safety Control	650
	5000

Additional points are applied for Climatic Conditions which are abnormal as compared to the average for the country and for Divergence where points for Water Supply and Fire Department are significantly different.

Fire Protection Zones are defined by Lexington-Fayette Urban Co. Government ordinance 73-74. Class 5 applies within Zones 2 Or 3 if within 5 miles of a Metro Fire Station and within 1,000 ft. of a creditable fire hydrant;

Class 9 applies within Zones 2 or 3 if within 5 miles of a Metro Fire Station but over 1,000 ft. from a fire hydrant. Class 10 applies if over 5 miles from Metro Fire Station

INSURANCE SERVICES OFFICE

160 WATER STREET NEW YORK, N. Y. 10038
TELEPHONE: (212) 487-8000

COMMERCIAL FIRE & ALLIED LINES DIVISION
P. ROBERT BECHTOLT, MANAGER

August 4, 1975

Mr. William R. Cobb, Vice-President &
General Manager
Kentucky-American Water Company
2300 Richmond Road
Lexington, Kentucky 40508

Dear Mr. Cobb:

There is enclosed a copy of the report on your city prepared as a result of our recent municipal fire protection survey.

We have sent to the mayor a sepia copy of the fire protection map prepared by our staff in connection with the survey. Prints can be made from this copy as needed.

We wish to thank you for the cooperation extended to our engineers while working in your city.

Very truly yours,

INSURANCE SERVICES OFFICE

Kenneth J. Carl
Director of municipal Surveys

kjc:fl
Encl.

Jack Sayre
502 423 0220
Called 150 Kentucky Louisville 2/80 for rating of w's supply vs. overall fire protection rating.

Insurance Services Office

MUNICIPAL SURVEY SERVICE

REPORT

File No. 144 on July, 1975

LEXINGTON-FAYETTE URBAN COUNTY GOVERNMENT, KENTUCKY
(FIRE PROTECTION ZONE 1)

GENERAL

On January 1, 1974, the governments of the City of Lexington and Fayette County were merged into the Lexington-Fayette Urban County Government, replacing and superceding the governments of the City of Lexington and Fayette County. This report covers Fire Protection Zone 1 which consists of the former City of Lexington plus immediately adjacent urban areas of Fayette County.

The 1970 U. S. Census shows a population of 174,323 for the entire area of Fayette County, and a population of 108,137 for the former City of Lexington. The current population of Fire Protection Zone 1 is estimated to be about 160,000. Fire Protection Zone 1 covers an area of about 55.6 square miles. About 65% of Fire Protection Zone 1 is built upon. Elevations range from 900 to 1060 feet above mean sea level.

WATER SUPPLY

AN ADEQUATE SUPPLY IS AVAILABLE. RESERVE PUMPING CAPACITY IS ADEQUATE, BUT POWER SUPPLY AND PIPING AND VALVING ARE ONLY FAIRLY WELL ARRANGED. THE ARTERIAL SYSTEM IS MAINLY WELL EXTENDED BUT LACKS LOOPING IN SOME AREAS. THE GRIDIRON IS FAIR, AND THERE ARE NUMEROUS DEAD ENDS. PRESSURES ARE FAIR AND WELL MAINTAINED. THE QUANTITIES AVAILABLE FOR FIRE FIGHTING ARE GOOD AT SHOPPING CENTERS AND BUSINESS DISTRICTS, EXCEPT TEST 9 WHICH IS ONLY FAIR; FAIR TO POOR AT INDUSTRIAL, WAREHOUSE, AND LUMBER YARD DISTRICTS BEING FAIR AT TESTS 16, 17, 18, 19, 22 AND 25, AND POOR AT TESTS 20 AND 21; GENERALLY GOOD AT INSTITUTIONAL DISTRICTS, EXCEPT POOR AT TESTS 27, 29, AND 30; AND GOOD AT APARTMENT AND RESIDENTIAL DISTRICTS. HYDRANT SPACING IS MAINLY FAIR IN COMMERCIAL* DISTRICTS AND FAIR TO POOR IN RESIDENTIAL DISTRICTS; THE CONDITION OF HYDRANTS IS MAINLY GOOD.

* * * * * *

General.- The system is privately owned by the Kentucky-American Water Company, a subsidiary of the American Water Works Service Company, and serves all areas within the county plus portions of adjacent counties. The system is under the direct control of the vice-president and general manager.

*Commercial districts include business, industrial, warehouse, institutional educational, hotel, and apartment occupancies.

Records of both the supply works and the distribution system are complete and up to date.

Alarms of fire are received by radio at the Main Plant and response is made to second alarms of fire. At least one man is always on duty at the Kentucky River Plant, and at the Main Plant. Crews are readily available during the day and on call at night.

Supply Works.- An adequate supply is available from the Kentucky River and impounding reservoirs on Hickman Creek. An intake on the Kentucky River supplies the River Plant in 2 lifts and an impounding reservoir in 3 lifts. An additional pump station at the reservoir supplies the Main Plant.

The Kentucky River Plant, the Main Plant, and the No. 4 Reservoir Pump Station reservoir pump station, and both treatment plants are supplied by single aerial power lines.

Distribution Storage.- There are two 1.0-mg and one 3.0-mg ground storage reservoirs on the system; each is equipped with a booster pump station; in addition, there are 4 elevated tanks with 3.55-mg total capacity.

Consumption.- The average system consumption for the 12 month period ending October 31, 1974, was 26.80 mgd. A maximum daily consumption of 35.41 mg occurred on September 4, 1973.

Pressures.- See fire flow table. Pressures obtained during fire flow tests ranged from 39 to 114 psi, and averaged 70 psi.

Distribution System.- Pipe in the distribution system is cast and ductile iron, concrete, and asbestos cement. There is a total of 782.6 miles of pipe in the system. In Zone 1 there are 541.11 miles of pipe, including 4.64 miles of 4-inch, and 227 miles of 6-inch. Dead ends in 4- and 6-inch mains total 23.48 miles.

The average valve spacing is 950 feet in representative commercial districts and 1000 feet in representative residential districts. There is an annual valve inspection program.

There are 3634 hydrants in Zone 1. All have a pumper outlet and two 2½-inch hose outlets. Each have a 6-inch valved branch connection. The average area served by each hydrant is 140,700 square feet in representative commercial districts and 269,300 square feet in representative residential districts. Hydrants are inspected annually by the water company.

Fire Flow Tests.- See table. Tests were witnessed on November 6 and 7, 1974, under normal conditions. The average system consumption for the 2 days of testing was 27.01 mg. Of 23 tests repeated at the same location as the previous survey, the quantities available increased at 20 locations and decreased at 3 locations.

Changes.- Since the 1965 report, the net intake capacity has been increased by 27.25 mgd, or 140%. Filter capacity has been increased by 16 mgd, or 67%, and high-lift capacity by 29.48 mgd, or 70%. In the distribution system hydrants have been increased by 2294, or 171%, and storage by 5.05 mg, or 144%. The average consumption has increased 76%, and the maximum daily consumption by 39%.

Proposals include the construction of 3.0-mg reservoirs near the University of Kentucky campus and in the northeast part of the county.

FIRE DEPARTMENT

THE DEPARTMENT HAS AN ADEQUATE NUMBER OF ENGINE COMPANIES AND 7 OF THE 8 LADDER COMPANIES NEEDED. EXISTING COMPANIES ARE MODERATELY TO CONSIDERABLY UNDERMANNED. PUMPER CAPACITY IS ADEQUATE. APPARATUS IS IN GOOD TO FAIRLY GOOD CONDITION, AND MAINLY WELL EQUIPPED. REPAIR FACILITIES AND THE PREVENTIVE MAINTENANCE PROGRAM ARE MAINLY GOOD. RESPONSE ASSIGNMENTS TO ALARMS ARE SATISFACTORY. TRAINING AND FIRE METHODS ARE FAIRLY GOOD.

* * * * * *

General.- In addition to the protection provided within Zone 1, the department also provides protection to the entire Lexington-Fayette Urban County area. The area being protected outside Zone 1 is approximately 227 square miles and has a population of approximately 18,000. Zone 1 is divided into 4 chief officer response districts for fire fighting purposes.

Membership.- There are 412 full-paid members as follows:

Fire Force:		
	Officers: Chief	26
	Company	110
	Fire Fighters & Drivers	252
Non-Fire Force		24

Note: Thirty-three members of the fire force perform non-fire fighting duties during the day and are assigned to companies at night.

Companies.- Seventeen engine and 7 ladder companies, and 3 ambulances, are in service in 14 fire stations (see table).

Members work an average of 56 hours per week. Considering vacations, sick leave, holidays, and details, the average number of members on duty with companies is about 94 during the day and about 104 at night. Off-shift members are called at the discretion of the officer in charge at the fire; outside aid is available from paid and volunteer departments.

Apparatus and Equipment.- Seventeen pumpers, 7 ladder trucks, 1 hose truck, 1 water tower, and 3 ambulances are in service; 6 pumpers, and several miscellaneous vehicles, are in reserve.

Repairs to apparatus are made at the fire department shop by 1 full time and 8 part-time mechanics. The preventive maintenance program includes annual tests of pumpers and of aerial ladders. Hose is tested annually to 250 psi pressure; 20% of the 2½-inch hose is over 10 years old and 49% of the 1½-inch hose is over 5 years old. Hose drying and storage facilities are provided at each fire station.

Training.- Training is under the supervision of a chief training officer, who has 1 full-time and 3 part-time assistants. Training facilities consist of a standpipe-equipped 5-story drill tower on a large paved area with 3 hydrants. A fire building, a sprinkler building, a drafting basin, a flammable liquid tank, and a propane tank are also provided. Classrooms are provided at Engine 6 quarters, on the first floor of the drill tower, and in the sprinkler building. At the time of the survey a classroom-auditorium building was under construction. During 1974, each shift of each company attended 5 eight-hour combined outdoor drills at the training grounds. Companies are required to hold class or discussions in stations for 3 hours per day. Pump operator and driver training are included with company training at the training grounds.

Seventy-three members of the department are enrolled in a fire science curriculum. Newly appointed officers receive 4 hours of instruction from the training division before assignment; instructor training is given annually to some officers. New members receive 6 weeks of instruction before assignment to companies. During 1974, each officer received 8-hours of instruction in the handling of fires involving radioactive materials. Companies inspect buildings for fire prevention and pre-fire planning purposes; 4017 commercial buildings and 4250 dwellings were inspected during 1973.

Response.- Response to box alarms and telephone alarms for fires in buildings is 2 or 3 engine companies, 1 or 2 ladder companies, 1 ambulance, and a chief officer. Response to areas outside Zone 1 is 2 engine companies and a chief officer. Response schedules are provided through fourth alarms. During 1973 there were 3,291 alarms for fire, and 8632 ambulance calls; of the total, 582 alarms were for fires in buildings.

Operations.- Fire methods include extensive use of booster and pre-connected 1½-inch hose lines. Large lines are laid at the discretion of the officer in charge and pumpers are connected to hydrants when large lines are used. Connections to sprinkler and standpipe systems were made by one of the first alarm companies. Rescue, laddering, ventilation, and salvage work are primarily performed by ladder companies. Fairly good use is made of self-contained breathing apparatus.

Changes.- Since the 1965 report, the department has merged with the county fire department. Department membership has been increased by 225, and the total number of members on duty with companies has increased. Eight engine, 4 ladder, and 3 ambulance companies have been established. Six additional fire stations have been built, and new training facilities and additional repair shop facilities have been provided.

FIRE SERVICE COMMUNICATIONS

THE FIRE ALARM SYSTEM IS FAIRLY RELIABLE AND FAIRLY WELL MAINTAINED. COMMUNICATION CENTER EQUIPMENT IS FAIRLY WELL HOUSED, BUT MOST OF THE EQUIPMENT IS OF AUTOMATIC RATHER THAN MANUAL TYPE. BOX DISTRIBUTION IS FAIR IN COMMERCIAL DISTRICTS, INCLUDING HIGH-LIFE HAZARD BUILDINGS; CONSPICUOUSNESS OF BOXES IS FAIRLY GOOD TO FAIR. ALARM CIRCUIT FACILITIES TO STATIONS ARE FAIRLY GOOD EXCEPT THAT INSTRUMENTS ON ONE CIRCUIT ARE CONNECTED TO A BOX CIRCUIT RATHER THAN AN ALARM CIRCUIT. DEPARTMENTAL TELEPHONE FACILITIES ARE FAIRLY GOOD BUT THE LISTING IN THE DIRECTORY IS UNSATISFACTORY. AN ADEQUATE NUMBER OF OPERATORS ARE ON DUTY.

* * * * * *

General.- The telegraph- and radio-type fire alarm systems are both maintained by fire department personnel.

The communication center is on the first floor of a 2-story fire-resistive addition to Engine 1 quarters. The operating room and the addition are not properly cut-off from the remainder of the building. A new 2-story fire-resistive communication center was under construction at the time of the survey.

Alarm System Facilities.- Communication center equipment for the telegraph equipment, installed in 1963, is of the automatic type with provisions for emergency ground return operation. Current is supplied by individual circuit rectifiers, with a common battery on standby. Communication center equipment for the radio box system, installed in 1970, is of the manual type and equipped with dual receivers. Each receiver is supplied by a separate branch circuit of alternating current. Two manually started emergency generators are provided.

Each fire station is provided with alarm instruments on a box circuit, and a radio-transmitter receiver, for receipt of alarms. There is no emergency power for the radio facilities in fire stations.

There are 196 telegraph and 28 radio type boxes in service of which 3 are inside buildings. The telegraph-type boxes are all of the succession type, with most having provisions for emergency ground return operation. However, many boxes are not grounded so that the latter feature cannot be properly utilized. No indicating lights are provided for boxes in commercial districts, and no identifying bands are provided on supporting poles; the condition of paint on boxes and pedestals is good.

Of the estimated 117 miles of circuits, less than 4% is in messenger-supported aerial cable; the remainder is of aerial wire construction. Serious ground readings were noted on each circuit. Six of 8 box circuits serve excessive areas.

Radio.- Base station equipment for the department radio system is installed in Engine 2 quarters, a building of ordinary construction. A standby unit is provided at the communication center; emergency power is provided at the latter location only. Remote-control units are provided in the operating room at the communication center. The department frequencies are also used by

the local civil defense unit. All apparatus in service and most in reserve is equipped with transmitter-receivers, and 12 portable units are provided.

Telephone Facilities.- Ten trunk lines, arranged for progressive operation in groups of 6 and 4, and a direct line from the telephone company operator extend to a single position switchboard at the communication center; an attempt is made to reserve some of the first 6 lines for emergency calls. Individual lines extend to each fire station, the police department, and department offices. The listing in the directory is unsatisfactory.

Operations.- Two operators are on duty at all times and a major is on duty days. Tests and records are fairly good.

Changes.- Since the 1965 report, a radio-type fire alarm system has been installed, and 52 telegraph boxes have been added to the existing system.

FIRE SAFETY CONTROL

FIRE PREVENTION

GOOD FIRE PREVENTION REGULATIONS ARE IN EFFECT. ENFORCMENT OF CODE PROVISIONS IS FAIR TO POOR. INSPECTION OF A NUMBER OF COMMERCIAL AND INDUSTRIAL OCCUPANCIES REVEALED MOST CONDITIONS TO BE FAIRLY GOOD WITH SEVERAL FAIR TO POOR.

* * * * * *

Regulations.- The municipality has recently adopted the 1970 edition of the Fire Prevention Code of the American Insurance Association; the 1963 edition of the Kentucky Standards of Safety with 1969 revisions, which include the standards of the National Fire Protection Association, are also adopted.

Enforcement.- Fire prevention and related activities are directed by the fire marshal under the authority of the chief of the fire department. He is assisted by 3 arson investigators, 9 regular inspectors, 6 district inspectors, and 1 secretary. The arson investigators, 8 regular inspectors, and the 6 district inspectors work 24-hour shifts spending 8 hours a day, 5 days a week on fire prevention activities; this results in 1 arson investigator, 5 regular inspectors, and 1 to 3 district inspectors on duty with the fire prevention bureau on weekdays. Ten members of the fire prevention bureau were appointed during the 4 months preceding the survey. No examination is required for appointment to the bureau.

The bureau conducts regular inspections of certain specific hazards and occupancies 4 times annually. In-service company personnel are required to conduct preplanning/fire prevention inspections of all commercial occupancies in their respective districts twice annually. Some unfamiliarity with code requirements was displayed by both company and bureau inspectors. Dwellings are inspected about once every 3 years by in-service company personnel. Some permits are issued, but mostly on an initial basis only.

Changes.- Since the 1965 report, the fire prevention code has been updated and 11 additional personnel have been assigned to the bureau.

BUILDING DEPARTMENT

MUNICIPAL BUILDING CODE PROVISIONS ARE GOOD. OPERATIONAL PROCEDURES AND ENFORCEMENT ARE FAIRLY GOOD.

* * * * * *

Regulations.- Municipal ordinances adopt the 1967 edition of the National Building Code and the State Standards of Safety. Wood shingle roof coverings are allowed outside the fire limits, but are generally not used.

Enforcement.- The chief building inspector is responsible for the enforcement of building regulations. His staff includes an assistant chief building inspector, 10 building inspectors, 1 electrical inspector, 1 landscape examiner, 2 relocation officers, 2 weed inspectors, 1 secretary, and 4 clerks. Applications are made, plans are reviewed, and permits issued. The review of fire safety features is coordinated with the fire prevention bureau. A minimum of 3 inspections are conducted of new construction. Records are satisfactory.

Changes.- Since the 1965 report, the building code has been updated. Six additional building inspectors have been appointed.

ELECTRICITY

ELECTRICAL REGULATIONS ARE GOOD. CONTROL OVER NEW ELECTRICAL INSTALLATIONS IS ADEQUATE. PERMITS ARE NOT ISSUED. REINSPECTION OF EXISTING WIRING IS CONDUCTED ON A LIMITED BASIS.

* * * * * *

Regulations.- The 1971 edition of the National Electrical Code is adopted for control over new electrical installations.

Enforcement.- Electrical regulations are enforced by 3 private inspection companies with one inspector each. Power is not connected to a new service until notice is received from the inspection company. Private inspection agencies do not have the authority to discontinue service. A minimum of 2 inspections are made of new installations, or more if needed. Wiring in new installations was satisfactory; wiring in existing installations was in generally fair condition.

Existing wiring in substandard housing is inspected on request or complaint by the electrical inspector in the building department.

Changes.- Since the 1965 report, the electrical code has been updated, and 1 additional private electrical inspector and a municipal electrical inspector have been appointed.

LOSS POTENTIAL ANALYSIS

SEVERE INDIVIDUAL OR GROUP FIRES ARE POSSIBLE IN SOME DOWNTOWN BLOCKS AND IN WAREHOUSING DISTRICTS WHERE WOOD FRAME OR ORDINARY CONSTRUCTION PREDOMINATES AND BUILDING LACK COMPLETE SPRINKLER PROTECTION. ELSEWHERE FIRES SHOULD BE CONFINED TO THE BUILDING OR SMALL GROUP OF ORIGIN.

* * * * * *

Business Districts.- The downtown business district consists of a number of blocks in the vicinity of Main Street, mostly between Broadway and Walnut Street. Buildings are primarily of ordinary construction, with some fire-resistive to 15 stories in height. A 13-story building of fire-resistive construction, for the housing of senior citizens, was recently completed at Rose and Vine Streets; a life-safety type sprinkler system is incorporated into the building. Strip business districts are located along portions of New Circle Road, Southland Drive, Winchester Pike, and at other scattered locations throughout the municipality.

Shopping Centers.- Lexington Mall at Richmond Road and New Circle Road, Fayette Mall at Nicholasville Pike and Reynolds Road, and Turfland Mall at Harrodsburg Road and Springhurst Drive are enclosed-mall type shopping centers of fire-resistive or noncombustible construction with heights to 2 stories, and complete sprinkler protection. In these enclosed malls spreading fires are unlikely; however, severe contents losses may be experienced due to smoke and water damage.

Other shopping centers include Eastland Shopping Center and Eastland Drive near New Circle Road, Northland Shopping Center at North Broadway and Withers Avenue, and Southland Shopping Center at Southland Drive and Southview Drive. Other smaller centers are located throughout the municipality; buildings are mainly of noncombustible or ordinary construction, some with partial sprinkler protection. In these districts, fires should normally be confined to the area or building or origin, except in buildings with large unsprinklered areas.

Industrial and Warehouse Districts.- A large manufacturing plant of International Business Machines is located near Newtown Street and New Circle Road; construction is 1-story noncombustible, with full sprinkler protection. A grouping of industrial occupancies is located in the vicinity of Harbison and Mercer Roads; included here are plants manufacturing furniture and paper products. Buildings are generally 1-story noncombustible construction, generally with complete sprinkler protection, and with minor exposures.

In the vicinity of Third Street and Walton Avenue are a number of lumber companies with extensive shed storage, 1 and 2 stories in height; construction is mainly wood frame. Fires here may spread beyond the building of origin.

Other, smaller industrial buildings are scattered throughout much of the city, singly and in small groups. Exposures are moderate to severe and construction varies. Fires in industrial districts should be confined to the group of origin.

Extensive tobacco warehousing facilities are located along the Southern Railroad, especially along South Broadway and Angliana Avenue. Construction is wood frame, ordinary, and noncombustible; a number of buildings are equipped with automatic sprinkler protection. Another complex of tobacco warehouses is located south of Reynolds Road and consists of a complex of noncombustible, fully-sprinklered buildings of low height used for storage by the R. J. Reynolds Company. Severe individual or spreading fires are possible in buildings where complete sprinkler protection is lacking.

Institutional Districts.- The University of Kentucky occupies several blocks in the vicinity of Rose Street and Avenue of Champions, and includes a complex of buildings mainly of fire-resistive or noncombustible construction, with heights to 22 stories. Separation between buildings is mainly good.

A number of hospitals are located throughout the city, usually singly, with heights to 9 stories. Construction is mainly fire-resistive with some noncombustible, and exposures are generally mild.

Schools in the city are generally fire-resistive or noncombustible buildings, 1 or 2 stories in height, with mild exposures. Fires in institutional districts should normally not spread beyond the area or building of origin.

Apartment Districts.- Concentrations of apartment housing units are located in the vicinity of Tates Creek Pike and New Circle Road, Richmond Road and New Circle Road, and Versailles Road and Alexandria Drive, with smaller groups and single buildings at other various locations. Construction is generally wood frame, 1, 2, or 3 stories in height, with good to poor separation. Fires in apartment districts should be confined to the building of origin except where spacing is close; adjacent buildings may become involved.

Residential Districts.- Residential sections consist mainly of buildings of wood frame construction with heights of 1 or 2 stories. Separation is fair to good; fires should normally not spread beyond the building of origin, with some damage possible to immediately adjacent buildings.

RECOMMENDED IMPROVEMENT PROGRAM

The following program has been prepared to assist the municipality in providing better protection to life and property and may be used as a guide for future planning. In general, recommendations under each heading are numbered in the order of their importance.

WATER SUPPLY

1. That additional hydrants be installed so that:

   a. There will be one or more at each street intersection in commercial districts, depending upon the required fire flow, with intermediate hydrants so that they are not over 300 feet apart.

b. There will be one at each street intersection in residential districts with intermediate hydrants so they are not over 500 feet apart.

2. That the supply facilities, piping, and power arrangements be improved so that the system will be able, in conjunction with available storage, to deliver the maximum daily consumption rate and required fire flow with a failure in any electric power line, transformer, or other appurtenance, or with a break in a main or a repair of a valve.

3. That the distribution system be improved to provide adequate fire flows. It is suggested that 4-inch mains be replaced or paralleled; that 6-inch dead ends be eliminated wherever practicable; and that the following be adopted as the standard minimum sizes of mains used for hydrant supply for all future construction:

a. 8- and 12-inch in commercial districts, the former to be used where it completes a good gridiron, and the latter for long lines not interconnected.

b. 8-inch in residential districts; 6-inch to be used only where it completes a good gridiron.

4. That all hydrants be inspected in the spring and fall and after use, the inspection to include operation; that they be maintained in good condition; and that suitable records of inspections, repairs, and condition be maintained.

FIRE DEPARTMENT

1. That at least 5 members, including an officer, be on duty at all times with each engine and ladder company.

NOTE: Six members on duty (including an officer) at all times with each engine and ladder company is considered standard manning.

2. That the training program be expanded to include more frequent drills at the training grounds (including night drills), additional officer and pump operator schools, and the continuation of drills and classes at fire stations.

3. That an additional ladder company, equipped with an aerial ladder or elevated platform truck, be established with Engine 9, and that Ladder Companies 1, 2, and 4 be provided with aerial ladder or elevating platform trucks.

4. That the apparatus replacement program be continued.

FIRE SERVICE COMMUNICATIONS

1. That the alarm system be converted from automatic to manual operation, and that a supervised dispatching circuit with suitable instruments be installed and extended to each fire station; that voice recording facilities for the radio system be provided; and that emergency generators at the communication center be arranged to start automatically on power failure, and normal electric power be connected to the supply side of the main building disconnecting means.

2. That the emergency telephone trunk lines be made progressive to the business lines, that automatic voice recording facilities be provided for incoming and outgoing calls, and that the department be properly listed in the telephone directory.

3. That additional boxes be installed so that one will be within 500 feet of every building in commercial districts, and at schools, hospitals, nursing homes, and places of public assembly.

4. That the reliability of the system be improved by:

a. Properly testing all boxes every 60 days, maintaining all boxes in good condition, and keeping proper records.

b. Placing circuits underground wherever possible or in messenger-supported aerial cable elsewhere.

c. Removing existing grounds on box circuits, and maintaining all circuits in good condition.

d. Providing additional box circuit facilities so that no box circuit will serve an excessive area.

e. Providing emergency power facilities at each fire station for the radio facilities.

5. That the communication center be relocated to a separate building of fire-resistive construction, as proposed.

FIRE SAFETY CONTROL

1. That adequate control be established and maintained over all hazardous materials, processes, and occupancies by strict enforcement of existing regulations, to be accomplished by teh expansion of inspection procedures by complete inspections by trained personnel familiar with the regulations and by a thorough follow-up of all violations found.

Note: If fire company members are used to make fire prevention inspections and to enforce the fire prevention code, it is recommended that they be properly trained to handle the more common hazards and that full-time bureau personnel handle the more complex hazards.

2. That the National Building Code, recently adopted by the city, be rigidly enforced; and that adequate control be established and maintained over heating and ventilating installations.

3. That a complete inspection of old wiring be made and defects corrected; and that all wiring be subsequently re-inspected at suitable intervals.

Report based on the survey made during October and November, 1974 by R. A. Pauley, W. T. Young, M. J. Kohlhagen, and D. M. Gramza. Acknowledgement is made of the assistance given by the major, and other officials.

Kenneth J. Carl, Director of Municipal Surveys
Municipal Survey Service
Insurance Services Office
160 Water Street
New York, New York 10038

TABLES

PUMPS

Station	No. of units	Capacity, each (mgd)	Pressure (psi)	Pumps from	Pumps to
Kentucky River Plant					
1st Lift	1	10.60	32	Kentucky River	2nd Lift Pumps
	1	10.50	"	"	" "
	2	8.50	30	"	" "
	1	6.50	26	"	" "
	1	4.50	"	"	" "
2nd Lift	2	10.80	145	1st Lift Pumps	Treatment Plant
	1	8.64	"	"	"
	2	4.51	147	"	"
	1	7.50	145	"	3rd Lift Pump
3rd Lift	1	8.01	130	2nd Lift Pumps	No. 4 Reservoir
High Lift	1	10.08	173	Treatment Plant	Distribution Sy
	1	10.00	183	"	" "
	1	8.06	173	"	" "
	1	7.33	152	"	" "
	1	4.03	147	"	" "
No. 4 Reservoir	1	16.10*	78	No. 4 Reservoir	Main Plant
	2	4.03	48	" "	" "
Main Plant	1	5.99	22	No. 1 Reservoir	" "
	1	4.03	"	" "	" "
	1	10.01	104	Main Plant	Distribution Sy
	1	6.51	82	" "	" "
	1	6.01*	99	" "	" "
	1	5.54*	100	" "	" "
	1	4.03**	95	" "	" "
Cox St.	1	2.51	81	1.0 mg Reservoir	Distribution Sy
York St.	1	2.51	81	" "	" "
Parker's Mill	1	9.00*	43	3.0 mg Reservoir	" "

*dual drive
**diesel drive

FIRE FLOW TESTS

Test Number	Location	Service	Pressure (psi) Hydrants Closed	Quantity gpm at 20 psi Required	Available
	BUSINESS DISTRICTS				
1	Newtown Pike & Interstate 75		80	4000	4700
2	Main St. between Mill & Broadway		78	7500	9200
3	Market & Short Sts.		75	6000	4100*
4	Main & Walnut Sts.		75	7000	9300
5	Euclid Ave. & High St.		71	3000	3300
6	Southland Dr. & Rebel Rd.		76	4500	14,100
	SHOPPING CENTERS				
7	12th St. & Broadway Northland S.C.		55	3500	4700
8	Darien & Alexandria Drs. Gardenside S.C.		77	3000	7100
9	Eastland & Goodwin Drs. Eastland S.C.		44	4500	3600
10	Larkspur Dr. & Harrodsburg Rd. Turfland Mall		75	3000	8900
11	Tates Creek Pike & Lansdowne Dr. Lansdowne S.C.		74	6000	8200
12	Dundee Dr. & Nicholasville Rd. Fayette Mall		61	3500	10,200
	INDUSTRIAL DISTRICTS				
13	Mengel & Harbison Rds.		20	3500	4000
14	Sturgill Dr. & Newtown St.		63	4000	7000
15	Franfort Pike East of Duncan Rd.		80	5000	13,400
16	Reed Ln. & N. Pin Oak Dr.		75	4500	3700
	WAREHOUSE DISTRICTS				
17	Liggett St. & Lisle Rd.		88	6000	3800
18	7th & Lancaster Sts.		65	6500	5700
19	4th & Henry Sts.		64	8000	6000
20	Manchester & Willard Sts.		79	7000	4900
21	Bolivar St. & Broadway		79	9000	4000
22	Angliana Ave. West of Broadway		64	8500	6700
23	Virginia Ave. & Broadway		69	3500	6700
24	Young & St. George Drs.		62	3500	4900
	LUMBER YARD DISTRICT				
25	Winchester Pike & Walton Ave.		60	8000	5600

FIRE FLOW TESTS

Test Number	Location	Service	Pressure (psi) Hydrants Closed	Quantity gpm at 20 psi	
				Required	Available
	INSTITUTIONAL DISTRICTS				
26	Chantilly St. & Sutton Pl.		84	2500	5900
27	4th St. & Broadway Transylvania University		64	4500	2200
*28	Main St. & Lafayette Ave.		64	5500	7100
29	Edgeworth & Winston Aves.		39	4000	1300
30	Henry Clay Blvd. & Meniffe Ave.		45	3000	1800
31	Maxwell St. & Harrison Ave.		63	2500	4000
32	Rose St. & Columbia Ave. University of Kentucky		61	4500	6200
33	Rose & Limestone Sts. U.K. - Medical Center		75	4000	8200
34	Mason Headly Rd. & Broadway		77	3000	5300
35	Cassidy Dr. & Providence Rd.		56	3500	3300
36	Suburban Ct. & Limestone St.		70	3500	4500
37	Hollyhill Dr. & Clays Mill Rd.		71	3000	6600
	APARTMENT DISTRICTS				
38	Fontaine Rd. & Lakeshore Dr.		56	5000	9300
39	Gribbin & Patchen Drs.		79	3000	7100
40	Kirklevington & Macadam Drs.		90	3500	4800
41	Greentree Rd. & Centre Pkwy.		114	5000	5400
	RESIDENTIAL DISTRICTS				
42	Shandon & Kent Drs.		74	1000	2100
43	Thurman & Brewer Drs.		48	1500	2600
44	Eastland Pkwy. & Atlanta Dr.		69	1500	3700
45	45th & Ohio Sts.		61	1500	2000
46	Della Dr. & Beacon Hill Rd.		90	1000	7000
47	Heather Way & Bellefonte Dr.		65	1500	5200
48	Severn & Runnymeade Ways		66	1500	2200
49	Cindy Blair Way & Roxburg Dr. E.		77	1500	5500
	ZONE 2				
-	Spur Rd. & Georgetown Pike		68	2500	1500
-	Leestown Pike & Circle "M" Ln.		111	4000	1100
-	Versailles & Van Meter Pikes		85	2500	1600

*Test re-run February 1975 after new main installed; now adequate.

FIRE COMPANIES AND APPARATUS

Company	Location	Members Normally on Duty	Apparatus Type and Year Built
Eng. 1	E. Third & Walnut Streets	7-8	1500-gpm Pumper-1974 50-ft. Water Tower Tk.-1970
Eng. 2	New Circle Rd. near Meadow Lane	3-4	1000-gpm Pumper-1971
Eng. 3	Roanoke Rd. bet. Alexandria & Maywick Drs.	3-4	1000-gpm Pumper-1955
Eng. 4	Jefferson St. bet. Maryland Ave. and W. Third Street	3-4	1000-gpm Pumper-1963
Eng. 5	Woodland Ave. & E. Maxwell Street	3-4	1000-gpm Pumper-1963
Eng. 6	S. Limestone & Scott Streets	4	1000-gpm Pumper-1974 Hose Truck-1961
Eng. 7	Tates Creek Rd. & Raven Rd.	3-4	750-gpm Pumper-1973
Eng. 8	Northern Parkway near Dover Road	3-4	1000-gpm Pumper-1965
Eng. 9	Richmond Rd. & Fontaine Rd.	3-4	1000-gpm Pumper-1969
Eng. 10	Near New Circle Rd. and Georgetown St.	3-4	1000-gpm Pumper-1965
Eng. 11	Harrodsburg Rd. & Bob-O-Link Drive	3-4	1000-gpm Pumper-1965
Eng. 12	Southland Dr. & S. Pin Oak Drive	3-4	1000-gpm Pumper-1972
Eng. 13	Leestown Pike bet. Lisle & S. Forbes Rd.	3-4	750-gpm Pumper-1965
Eng. 14	With Eng. 3	3-4	1000-gpm Pumper-1962
Eng. 15	Reynolds Rd. & Southern RR	3-4	750-gpm Pumper-1955
Eng. 16	With Engine 8	3-4	750-gpm Pumper-1953
Eng. 17	With Engine 9	3	750-gpm Pumper-1961
Lad. 1	With Engine 3	3-4	Service Ladder Truck-1973
Lad. 2	With Engine 7	3-4	Service Ladder Truck with 750-gpm Pump-1961
Lad. 4	With Engine 11	3-4	Service Ladder Truck-1969
Lad. 1A	With Engine 1	6	100' Aer. Lad. Truck-1966
Lad. 2A	With Engine 5	3-4	100' Aer. Lad. Truck-1956
Lad. 3A	With Engine 10	3-4	85' Aer. Lad. Truck-1974
Lad. 4A	With Engine 15	3-4	85' Aer. Lad. Truck-1974
Amb. 1	With Engine 1	2	Ambulance-1972
Amb. 3	With Engine 2	2	Ambulance-1972
Amb. 4	With Engine 6	2	Ambulance-1972

COMMONWEALTH OF KENTUCKY
PUBLIC SERVICE COMMISSION

IN THE MATTER OF:

APPLICATION OF KENTUCKY-AMERICAN WATER COMPANY FOR A DETERMINATION BY THE PUBLIC SERVICE COMMISSION OF THE ADEQUACY OF ITS WATER STORAGE CAPACITY ANALYSIS DATED DECEMBER 21, 2005, AND FOR A DEVIATION FROM 807 KAR 5:066, SECTION 4 (4), UNTIL DECEMBER 31, 2020, PURSUANT TO 807 KAR 5:066, SECTION 18	)	CASE NO. 2005-00546

RESPONSE TO COMMISSION STAFF'S FIRST SET OF INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS DATED AUGUST 3, 2006

Item No. 12

Witness: Linda C. Bridwell

12. Refer to "Kentucky-American Water Company Storage Capacity Analysis" (Dec. 21, 2005) at 19.

    a. Provide all workpapers, show all calculations, and state all assumptions used to reach the conclusion that "[a]dditional storage to meet a general standard of one-day storage volume would cost the ratepayers an additional $13 million."

    b. State the effect on an average customer's monthly rates of this additional cost. Provide all workpapers, show all calculations, and state all assumptions used to develop the response.

    c. State the cost to Kentucky-American ratepayers of meeting a standard of one-half of one-day storage volume. Provide all workpapers, show all calculations, and state all assumptions used to derive this amount.

    d. State the effect on an average customer's monthly rates of maintaining a standard of one-half of one-day storage volume. Provide all workpapers, show all calculations, and state all assumptions used to develop the response.

RESPONSE:

    a. There are no workpapers available in the file. Please see attached calculations.

    b. In reviewing the cost estimate based on actual 2005 construction costs, it appears that the increased storage costs in the report are too low and should be $16 million. The estimated impact on an average customer's monthly rate of this additional cost is a 4.314 % increase. This would be approximately $0.94 per month on the monthly bill of an average residential customer using 5700 gallons per month. This impact includes only water service costs, and does not include

taxes or other fees applied to the water bill. Please see attached rate impact analysis.

c. Kentucky American Water currently has one-half of one-day storage volume available in all of its pressure zones, so there would not be any additional cost to ratepayers to meet that standard.

d. Please see the response to Item c above.

Proposed Additional Storage

Cost Estimate	Project Description	2002 Cost Estimate
$1,750,000	Additional 3.0 MG ground storage at Hume Road	$1,500,000
1,750,000	Additional 3.0 MG ground storage at Parkers Mill Road	1,500,000
4,500,000	Two additional 3.0 MG ground storage - new location	3,500,000
4,500,000	Two additional 3.0 MG ground storage - new location	3,500,000
3,500,000	Additional 2.0 MG Elevated storage - new location	3,000,000
$16,000,000	Total	$13,000,000

Year Completed	Project Number	Project	Actual Cost
2005	12020105	Russell Cave Road Tank - 1.0 MG	$1,527,501
2205	12020301	Elevated Storage Tank - 2.0 MG *	$3,513,126
2004	12020102	Clays Mill Ground Storage Tank	$1,601,091
2000	96-18	Briar Hill Road Tank & Booster	$1,370,000
1996	91-01	Clays Mill Ground Storage Tank	$3,175,050

* Includes Land acquisition costs of $400,000

KY- AMERICAN WATER COMPANY
ECONOMIC ANALYSIS
One-half of One Day Storage (20 MG)

Type	(000's) Amount	Capital Structure	Cost Rate	Weighted Average Cost Rate	Revenue Multiplier	Revenue Requirement
Debt	$81,944	53.4%	6.33%	3.38%		3.38%
Preferred	$6,029	3.9%	7.72%	0.30%	1.67680	0.51%
Equity	$65,594	42.7%	10.00%	4.27%	1.67680	7.16%
Total Financing Rate						11.05%

Capital structure and debt, preferred stock & equity cost rates are based on latest rate case

Total Revenue Requirement	**Amount**	**Rate**
Total Estimated Cost of Project (Company Funded Only)	$16,014,771	
Financing (based on above cost of capital)	$1,769,333	11.05%
Depreciation (based on existing rates applied to cost estimates by acct)	286,664	1.79%
Property Tax (applies to land & structures accounts only)	0	1.42%
Revenue From New Customers	0	
Change in Operating & Maintenance Expense		
Total Additional New Revenue Required to Support Project	$2,055,998	
Projected 2005 Revenues	$47,657,629	
Required Price Increase	4.314%	

Revenue Multiplier Calculated as follows:

* **Calculation:**	
	100.00%
State Tax Rate	8.25%
Taxable Remainder	91.75%
Federal Tax Rate	35.00%
Effective Federal Tax Rate	32.11%
State Portion	8.25%
Federal Portion	32.11%
Effective Tax Rate	40.36%
Tax Expansion Factor (100% - 41.49%)	59.64%
Revenue Multiplier: (100% / 58.51%)	1.67680