Kentucky-American Water Company

1025 Laurel Oak Road • P.O. Box 1770 • Voorhees, New Jersey08043 • (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	$110,000
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:
PRESIDENT 12/9/02

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- ol

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	$ 6,000	$ 6,000						$ 12,000
Final Design	Consultant							$ 10,610	$ 25,000	$ 25000	$ 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	$ 6,000	$ 15,610	$ 25000	$ 25000	$ 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	$ 160.000

KENTUCKY-AMERICAN WATER COMPANY

REVISED CAPITAL INVESTMENT PLAN PROJECT 03- 01

2 MG ELEVATED STORAGE TANK

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	2003 Carryover	2004 Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	TOTAL 2004
Preliminary Design	KAWC / Consultant	$ 12,000													$ -
Final Design	Consultant	$ 125,610	$ 25.000	$ 15,000	$ 15,000	$ 15.000	$ 15.000								$ 85,000
Const Admin / Inspection	KAWC / Consultant	$ -									500	1000	1000	1000	$ 3,500
Matenals	KAWC	$ -									30000	30000	30000	30000	5 120,000
Construction	Contractor	$ -									20000	45000	50000	50000	5 165.000
Land Acquisition	KAWC	$ -				$ 50.000	$ 50.000	$ 50.000	5 50,000	$ 50.000					$ 250.000
SUB-TOTAL		$ 137,610	$ 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- 0 \

2 MG ELEVATED STORAGE TANK

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	Prior Canyover	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													$ -
SUBTOTAL		$ 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
OSC (+/- 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		$ 846,110	$ 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

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November 25, 2002
IP 03-

KENTUCKY-AMERICAN WATER COMPANY
PROPOSED INVESTMENT PROJECT 03 -
KYDOT MAIN RELOCATIONS

Reference: Strategic Business Plans for 2002, 2001, 2000 and 1999

SUBJECT

Existing mains that conflict with road construction undertaken by the Kentucky Department of Transportation must be replaced.

RECOMMENDATION

It is recommended that approximately 10,500 feet of water main be designed/installed in 2003 to relocate those existing mains that create a conflict with KY DOT projects.

ESTIMATED COST

Total Estimated Cost	$700,000
Proposed 2003 Expenditure	$700,000
Total Estimated Reimbursements	$300,000
Reimbursements for 2003 relocations	$300,000

ADEQUACY

The proposed investment project will be adequate for design, permitting, bidding and installation of new mains to relocate facilities which conflict with the KY DOT projects identified in the attached Exhibit "A"

INVESTMENT PROJECT REVIEW

DEPARTMENT	BY	DATE
ENGINEERING	John V. Young	12-3-02
WATER QUALITY	N/A	
INFO. SYSTEMS		
OTHERS		
RECOMMENDED FOR APPROVAL: PRESIDENT		12/9/02

DISCUSSION

Water mains and other facilities must be relocated when they conflict with KY DOT roadway projects. The KY DOT has increased its construction activity as a result of elevated federal funding. This activity is expected to remain high through 2004. The volume and intensity of the construction program is resulting in more "fast tracking", and the DOT's priorities are often changed without prior notice. The most recent schedule of KY DOT projects that will affect KAWC facilities in 2003 is attached as Exhibit "A". This schedule will be revised as required by changes to the DOT plan and schedule.

Kentucky-American has worked diligently with the Kentucky Department of Transportation on partnering during the construction process to avoid delays, schedule work in coordination with roadwork, and to minimize facilities impact. This has worked extremely well on recent projects including the Paris Pike project where Kentucky-American relocations were bid with the highway contract work. Kentucky-American anticipates more partnering in the near future.

The KY DOT is required to reimburse KAWC when the existing facilities lie in private easement. This is estimated to include nearly 50% of the 2003 projects.

The total project cost estimate of $700,000 is accurate to within plus/minus 15 percent for the projects listed.

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

Nick O. Rowe
Vice-president Operations

KENTUCKY-AMERICAN WATER COMPANY

PROPOSED 2003 CAPITAL INVESTMENT PLAN PROJECT 03-

KYDOT MAIN RELOCATIONS

ITEM	RESPONSIBLE ENTITY	TOTAL ESTIMATED COST
Design/Easement Acquisition	KAWC / Consultant	$ 20,543
Construction & Materials	Contractor	$ 610,000
Inspection	KAWC	$ 8,000
	Sub-Total	$ 638,543
O&C (3%)		$ 19,156
Engineering Overhead (2%)		$ 12,771
	Sub-Total	$ 670,470
AFUDC		$ 29,530
	Total	**$ 700,000**

KENTUCKY-AMERICAN WATER COMPANY

PROPOSED 2003 CAPITAL INVESTMENT PLAN PROJECT 03-

KYDOT MAIN RELOCATIONS

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	2003 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL 2002
Design/Easement Acquisition	KAWC / Consultant													$ 20,543
Construction	Contractor													$ 610,000
Company Labor	KAWC													$ 8,000
SUB-TOTAL		$ 51,500	$ 51,500	$ 51,500	$ 51,500	$ 51,500	$ 55,500	$ 55,500	$ 51,500	$ 52,000	$ 52,000	$ 52,000	$ 62,543	$ 638,543
O&C (3%)		$ 1,545	$ 1,545	$ 1,545	$ 1,545	$ 1,545	$ 1,665	$ 1,665	$ 1,545	$ 1,560	$ 1,560	$ 1,560	$ 1,876	$ 19,156
Overhead (2%)		$ 1,030	$ 1,030	$ 1,030	$ 1,030	$ 1,030	$ 1,110	$ 1,110	$ 1,030	$ 1,040	$ 1,040	$ 1,040	$ 1,251	$ 12,771
AFUDC		190	600	1,000	1,410	1,820	2,240	2,670	3,100	3,500	3,910	4,320	4,770	$ 29,530
CASH FORECAST		$ 54,265	$ 54,675	$ 55,075	$ 55,485	$ 55,895	$ 60,515	$ 60,945	$ 57,175	$ 58,100	$ 58,510	$ 58,920	$ 70,440	$ 700,000

KENTUCKY-AMERICANWATER COMPANY
KYDOT MAIN RELOCATIONS
REVISED INVESTMENT PROJECT 02-02

Exhibit A
List of 2003 DOT Projects

Project Name	Footage	Pipe Size	Estimated Cost
Wellington Way	1,100	24"	$100,000
Reynolds Road	2,500	12"	$130,000
Louden Avenue	5,000	24", 6"	$200,000
Harrodsburg Road	7,400	16"	$270,000
Subtotal			$700,000
Potential Reimbursements			
Harrodsburg Road (2002 & 2003)			($175,000)
Wellington Way			($60,000)
Louden Avenue			($65,000)
Subtotal			($300,000)
Total Company Expenditures			$400,000

KENTUCKY-AMERICAN WATER COMPANY
ECONOMIC ANALYSIS OF THE IMPACT OF CAPITAL
SPENDING PROPOSAL
KY DOT MAIN RELOCATIONS IP 02-02

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		$ 700,000
Investment by Others		(300,000)
Net Investment Financed by Company		$ 400,000
New Common Equity	$ 160,000	
New Long Term Debt	240,000	

Total Revenue Requirement		Amount	Rate
Required Pre-Tax Operating Income		$ 46,320	11.58%
Depreciation Rate	1.180%	4,720	1.18%
Property Tax Rate	0.7037%	2,815	0.70%
Change in Operation & Maint. Expense		0	0.00%
Revenue from New Customers		0	0.00%
Total Net Revenue Requirement		$ 53,855	13.46%
Revenue Tax Rate	0.14537%	78	0.02%
Total Revenue Requirement		$ 53,933	13.48%
Latest 12 Months Revenue - 09/30/2002		$ 42,262,154	
Required Price Increase		0.13%	

Kentucky-American Water Company

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November 15, 2002
IP 03-03
Project No. 112

KENTUCKY-AMERICAN WATER COMPANY
PROPOSED INVESTMENT PLAN PROJECT 03-03
RELIABILITY IMPROVEMENTS

Reference: 2003 Proposed Annual Business Plan, 2002 Storage Analysis, 2002 July 31 Incident Report.

SUBJECT

The KAWC system is vulnerable to a disruption in water service if a power outage occurs during peak demands. A similar incident on July 31, 2002 resulted in customer outages and resultant Boil Water Advisory.

RECOMMENDATION

It is recommended that electrical, valving, pumping and SCADA improvements to KAWC's existing facilities be made to prevent customer disruption should a power outage occur during peak demand periods.

ESTIMATED COST

Total Estimated Cost	$1,320,000
Proposed 2003 Expenditure	400,000
Proposed 2004 Expenditure	920,000

ADEQUACY

The proposed investment project funds are estimated to be adequate for design and construction of the proposed improvements.

INVESTMENT PROJECT REVIEW

DEPARTMENT	BY	DATE
ENGINEERING		11-26-02
WATER QUALITY	N/A	
INFO. SYSTEMS		
OTHERS		

RECOMMENDED FOR APPROVAL: 12/9/02
PRESIDENT

DISCUSSION

On July 31, 2002, Kentucky-American Water Company (KAWC) lost power to its Kentucky River Station (KRS) treatment facility. At the time, KAWC was experiencing peak demands. KRS was producing 48 million gallons per day (mgd) and the Richmond Road Station (RRS) treatment plant was producing 16 mgd. Since there is very little floating storage in the KAWC system, the system de-pressurized quickly once the main supply from KRS was interrupted. Within two minutes of the power failure, the RRS discharge pressure dropped from 77 psi to 25 psi. The pressure recorder at the highest point in the system dropped to 0 psi. Pressure dropped throughout the southern half of KAWC's distribution system.

Kentucky Utilities (KU) employees were immediately dispatched to the KRS. Within five minutes of the power failure, KAWC began switching to the diesel engine back-up of one of its high service pumps at the KRS. Pumps at two of the storage tanks were turned on by remote signal and the RRS began pumping at 25 mgd. The RRS raw water source was switched from the Kentucky River to Jacobson Reservoir. The operator remotely activated three other tanks as system pressures began to rise.

Within thirty minutes, the back-up diesel engine had been activated at the KRS and was operating its high service pump at 10 mgd, pumping from the KRS clearwell. No other diesel back up is available at the KRS for treatment or pumping. System pressure was back to normal within forty minutes. KAWC issued a precautionary boil water advisory for its entire system that lasted 22 hours. KAWC has experienced some public criticism for the lack of reliability, and the Kentucky Public Service Commission has asked for a review of KAWC's storage facilities in light of the incident. As a follow-up to that incident, KAWC has undertaken a review of its operating procedures and facilities to determine the most effective way to prevent customer disruption if a similar event occurred in the future.

KAWC personnel followed pre-established emergency procedures, which accounted for efficient and swift response. No significant changes to the operating procedures are recommended.

A review of the facilities has determined that some modifications should be made that will minimize or even eliminate the customer impact if a similar event occurred in the future. KAWC has a dual feed of 69 kV overhead transmission lines for electrical power at the KRS. Transmission comes from two different substations that are fed from two different generating facilities. The dual feeds come into a single substation, with parallel but separate feeds for three miles into the KRS substation. The switch between the dual feeds currently must be done manually, which requires nearly an hour even if KU personnel are dispatched immediately. Power then feeds through a single transformer at the plant and is split to dual feeds for each of two halves of the plant. The single transformer is 40 years old and has been identified as a vulnerable point because failure would cause a minimum of 48 hours of outage.

KAWC has twelve storage facilities and two treatment plant clearwell systems in the Lexington area that have a total volume of 20.71 million gallons. Eight of the tanks operate in what is considered the Main Service zone that covers all of Fayette, Woodford, and Jessamine Counties and the southern parts of Clark, Scott and Bourbon Counties. These tanks total 14.5 million gallons and all but one are pumped storage facilities. The Tates Creek Road tank with a volume of 0.5 million gallons is an elevated storage tank in this service zone. Because of the time of day, all but one of the pumped storage facilities were full and none were pumping into the distribution system in anticipation of peak how demands later that evening. The Tates Creek tank is higher in elevation than the prevailing hydraulic grade line in the KAWC Main Service gradient. Therefore, it was less than one-third full when the power outage occurred, and it emptied within a few minutes.

In the event of an immediate loss of power during peak demand operations, the system must be able to stabilize pressures automatically for the first fifteen minutes to give operators time to respond. After reviewing all alternatives, it was determined that this can best be addressed by elevated storage, supported by automatic activation of the pumped storage tanks. The Tates Creek elevated tank, if full, could sustain system pressures with the loss of 48 mgd from KRS for ten to fifteen minutes.

The pumped storage facilities can currently be activated remotely but require the attention of the operators. With minimal SCADA programming, these facilities can be adjusted to activate automatically in a system-wide pressure loss. However, on July 31, the three largest pumped storage facilities could not be immediately activated because the ball valve system at those tanks would not open against the minimal system pressure. These ball valve systems can be modified to open on low system pressure at a moderate cost. The RRS production rate cannot be adjusted automatically without manually changing some chemical feed rates. This is being corrected during the ongoing DCS improvement project.

In a future event, within the first five to fifteen minutes, the pumped storage facilities would be activated automatically, to further stabilize system pressures. The RRS operator would be able to increase the production rate of the plant in this time period to further stabilize system pressures. Electric feed to the KRS could be switched to the second transmission within the first five minutes by a remote switching mechanism. KRS plant personnel could begin restarting the plant.

In order to provide immediate reliability improvements that will be further enhanced by future elevated storage, the following improvements are included under this Investment Project. KAWC will have KU install sectionalizing breakers at its substation and necessary electrical equipment adjustments, thus minimizing the time to switch electrical power feeds. KAWC will install a redundant 4 kV transformer at the KRS substation and install the necessary electrical equipment adjustments. KAWC will upgrade the SCADA controls so that the pumped storage tanks will be automatically activated when a system pressure drop is detected. KAWC will

retrofit the Tates Creek tank with a booster station and altitude valve to allow greater use of the Tates Creek tank during peak demand periods. KAWC will improve the ball valve systems on the three large tanks and the Newtown Booster station to allow operation when system pressure is lost. The construction of floating storage is recommended, and will be proposed as a future project in the Strategic Business Plan.

The total cost estimate is within +/- ten percent based on equipment availability and can be completed over 2003-2004.

Linda C. Bridwell, PE
Director of Engineering

Nick O. Rowe
Vice President – Operations

NOR/lcb

KENTUCKY-AMERICAN WATER COMPANY
ECONOMIC ANALYSIS OF THE IMPACT OF CAPITAL
SPENDING PROPOSAL
RELIABILITY IMPROVEMENTS

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		$ 1,320,000
Investment by Others		0
Net Investment Financed by Company		$ 1,320,000
New Common Equity	$ 528,000	
New Long Term Debt	792,000	

Total Revenue Requirement		Amount	Rate
Required Pre-Tax Operating Income		$ 160,776	12.18%
Depreciation Rate	4.790%	63,228	4.79%
Property Tax Rate	0.7037%	9,289	0.70%
Change in Operation & Maint. Expense		0	0.00%
Revenue from New Customers		0	0.00%
Total Net Revenue Requirement		$ 233,293	17.67%
Revenue Tax Rate	0.14537%	340	0.03%
Total Revenue Requirement		$ 233,633	17.70%
Latest 12 Months Revenue - 09/30/2002		$ 42,262,154	
Required Price Increase		0.55%	

KENTUCKY-AMERICAN WATER COMPANY

PROPOSED INVESTMENT PLAN PROJECT 03-02

RELIABILITY IMPROVEMENTS

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	2004 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL 2004	TOTAL PROJECT
4 kV Transformer at KRS	KAWC	$ 10,000	$ 10,000	$ 10,000	$ 10,000	$ 100,000	$ 700,000	$ 10,000						$ 850,000	$ 850,000
Sectionalizing Breaker	Kentucky Utilities	$ 10,000												$ 10,000	$ 200,000
Ball Valve Improvements	KAWC													$ -	$ 25,000
Tates Creek Tank Retrofit	KAWC/Cont.													$ -	$ 150,000
Tank SCADA programming	KAWC/Cons.													$ -	$ 10,000
SUB-TOTAL		$ 20,000	$ 10,000	$ 10,000	$ 10,000	$ 100,000	$ 700,000	$ 10,000	$ -	$ -	$ -	$ -	$ -	$ 860,000	$ 1,235,000
O&C (+/- 3%)		$ 600	$ 300	$ 300	$ 300	$ 3,000	$ 21,000	$ 300	$ -	$ -	$ -	$ -	$ -	$ 25,800	$ 37,050
Overhead (+/- 2%)		$ 410	$ 210	$ 210	$ 210	$ 2,060	$ 14,420	$ 210	$ -	$ -	$ -	$ -	$ -	$ 17,730	$ 25,460
AFUDC		$ 74	186.6	$ 262	$ 339	$ 750	$ 3,732	$ 6,401						$ 11,745	$ 18,475
CASH FORECAST		$ 21,084	$ 10,697	$ 10,772	$ 10,849	$ 105,810	$ 739,152	$ 16,911	$ -	$ -	$ -	$ -	$ -	$ 915,275	$ 1,320,000

KENTUCKY-AMERICAN WATER COMPANY

PROPOSED INVESTMENT PLAN PROJECT 03-03

RELIABILITY IMPROVEMENTS

DESCRIPTION OF ACTIVITY	ENTITY RESPONSIBLE	Priors	2003 JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC	TOTAL 2003
4 kV Transformer at KRS	KAWC		$ -												$ -
Sectionalizing Breaker	Kentucky Utilities		$ 3,000	$ 3,000	$ 50,000	$ 35,000	$ 50,000	$49,000							$ 190,000
Ball Valve Improvements	KAWC		$ 2,000	$ 7,000	$ 1,000	$ 15,000									$ 25,000
Tates Creek Tank Retrofit	KAWC/Cont.		$ 3,000	$ 11,150	$ 39,400	$ 42,700	$ 43,410	$ 10,340							$ 150,000
Tank SCADA programming	KAWC/Cons.		$ 2,000	$ 2,500	$ 4,200	$ 1,300									$ 10,000
SUB-TOTAL			$ 10,000	$ 23,650	$ 94,600	$ 94,000	$ 93,410	$ 59,340	$ -	$ -	$ -	$ -	$ -	$ -	$ 375,000
O&C (+/- 3%)			$ 300	$ 710	$ 2,840	$ 2,820	$ 2,800	$ 1,780	$ -	$ -	$ -	$ -	$ -	$ -	$ 11,250
Overhead (+/- 2%)			$ 210	$ 490	$ 1,950	$ 1,940	$ 1,920	$ 1,220	$ -	$ -	$ -	$ -	$ -	$ -	$ 7,730
AFUDC			$ 37	$ 163	$ 604	$ 1,310	$ 2,017	$ 2,599	$ -	$ -	$ -	$ -	$ -	$ -	$ 6,729
CASH FORECAST		$0	$ 10,547	$ 25,013	$ 99,994	$ 100,070	$ 100,147	$ 64,939	$ -	$ -	$ -	$ -	$ -	$ -	$ 400,709

H:\Engineering\IPs\02-XXX Water Supply Project Development\Reliability Improvements-detail cost 2003
11/22/2002

KENTUCKY-AMERICAN WATER COMPANY

PROPOSED INVESTMENT PLAN PROJECT 03-03

RELIABILITY IMPROVEMENTS

ITEM	RESPONSIBLE ENTITY	TOTAL ESTIMATED COST
4 kV Transformer at KRS	KAWC	$ 850,000
Sectionalizing Breaker	Kentucky Utilities	$ 200,000
Ball Valve Improvements	KAWC	$ 25,000
Tates Creek Tank Retrofit	KAWC/Cont.	$ 150,000
Tank SCADA programming	KAWC/Cons.	$ 10,000
	Sub-Total	$ 1,235,000
O&C (+/- 3%)		$ 37,050
Engineering Overhead (+/- 2%)		$ 25,460
	Sub-Total	$ 1,297,510
AFUDC		$ 18,475
	Total	**$ 1,315,985**

Estimate $ **1,320,000**