


# Discussion

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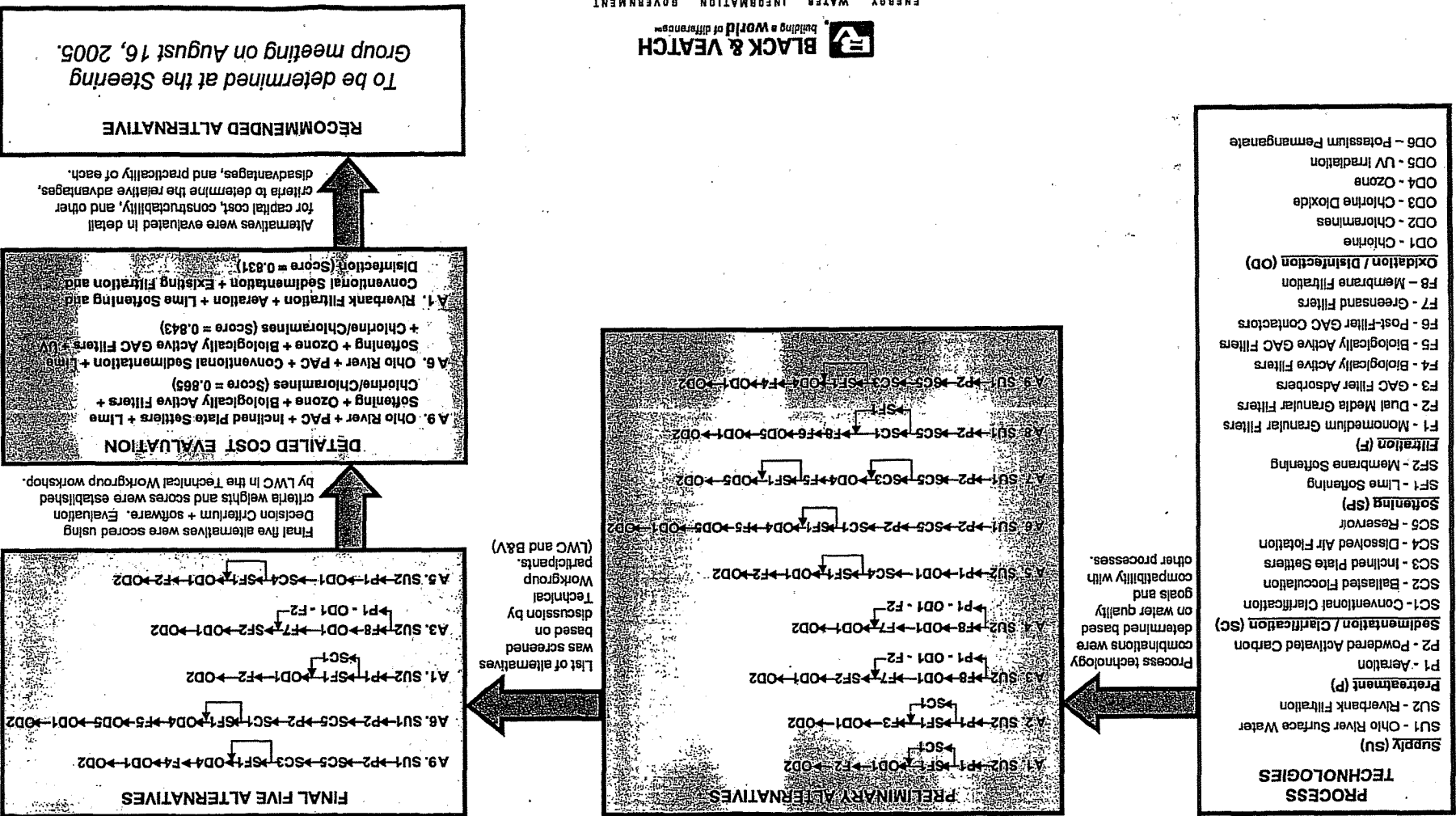
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# EXHIBIT 2 LOUISVILLE WATER COMPANY CHFP - ADVANCED TREATMENT STUDY TREATMENT OPTION SELECTION PROCESS



# **Louisville Water Company**

## **Minutes**

### **Crescent Hill Advanced Treatment Technology Steering Group**

**August 16, 2005**

**Present:** Kay Ball, Larry Gaddis (Black & Veatch), Greg Heitzman, John Huber, Rick Johnstone, Susan Lehmann, Bruce Long (Black & Veatch), Heather Mackey (Black & Veatch), Gerald Martin, Bob Miller, Jim Smith, Karla Teasley, Steve Tucker, Marita Willis, and Joe Wise.

**Absent:** Steve Greseth (Black & Veatch) and Jack Wang.

#### Agenda and Minutes Review – Greg Heitzman

Greg Heitzman distributed the meeting agenda, minutes from the June 7 meeting, a Treatment Option Selection Process chart, and a copy of the PowerPoint presentation from Black & Veatch. Copies of these documents will be filed with the August 16 minutes.

Gerald Martin remarked on the June 7 meeting minutes, pages 6 and 7, clarifying that he felt the Board of Water Works input should be obtained with regard to the ranking criteria and weightings. With this clarification the June 7 meeting minutes were approved as written.

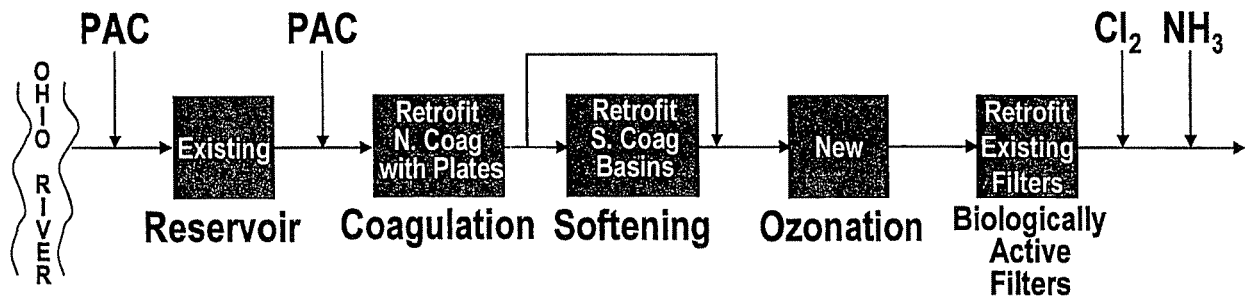
#### Review of Final Three Treatment Options – Larry Gaddis / Bruce Long

Larry Gaddis reminded the Steering Group that we have been working towards this point for the past six months. Work with the Technical Group has concluded and options have been narrowed to three. We will take a more definitive look at the final three options along with recommendations from Black & Veatch.

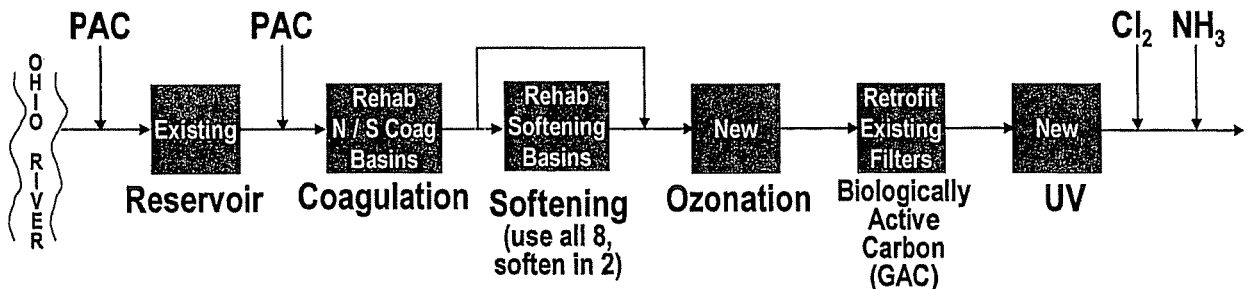
Bruce Long reviewed the selection process and considerations made at each step. A series of sequential processes were considered. The sequences of processes are important because if one barrier should fail, our public is still protected by the other barriers within a given sequence. "Schedule" was removed from the evaluation criteria because it is already considered under a separate category called "Constructability".

Alternative 9 (RI/BAF) is a sequence of technologies that begins with Ohio River surface water (referred to as River Intake or RI) and utilizes ozone and biologically active filters (BAF) containing green sand and anthracite. Powder activated carbon (PAC) is used to remove taste and odor. Four of the existing eight basins would be used for coagulation and would contain inclined plates for solids removal. The remaining four basins would be used for softening. Only a portion of the water would need to be softened; the other portion would bypass the softening step on to ozonation. Ozonation is a disinfectant technology that we currently do not have at LWC. After ozonation, water would pass through the BAF, which helps remove compounds.

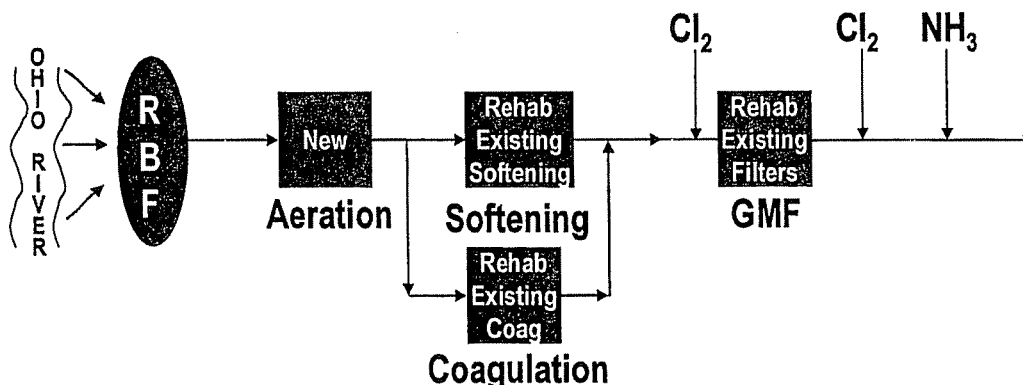
John Huber was concerned about the effectiveness of disinfection with chlorine and then ammonia to remove all of the bacteria coming off of the BAF. Bruce Long explained that the contact time with the chlorine is increased to achieve effective bacteria removal. Alternative 9 (RI / BAF) process diagram is shown below.



Alternative 6 (RI/BAC) also begins with RI and utilizes biologically activated carbon (BAC) and ultraviolet (UV). This option uses all eight of the existing coagulations basins, which allows time for staff to make changes in the treatment process. This is particularly useful in treating source water that is flashy, like the Ohio River. Ozone purees organisms present in the water, making them small enough for the bacteria in the BAC to consume. Thus, BAF are not needed in this process. The biologically active carbon (BAC) used in this process is granular activated carbon (GAC), which is more expensive than green sand and anthracite. Alternative 6 (RI / BAC) process diagram is shown below.



Alternative 1 (RBF) begins with source water from the Riverbank Filtration (RBF) well and utilizes granular media filtration. This process begins with aeration followed by some softening and coagulation. Aeration is used to take care of the iron (Fe) and manganese (Mn) in the water. Bacteria are not used in the granular media filters (GMF). Alternative 1 (RBF) process diagram is shown below.





### Results of Detailed Evaluation – Bruce Long

Cost comparison results of the final three alternatives are provided in the table below.

Cost (in Millions of Dollars)			
Alternative	Capital Cost	O&M	Present Worth
A9 – RI/BAF	\$138	\$6.96	\$233
A6 – RI/BAC	\$122	\$8.79	\$241
A1 – RBF	\$237	\$7.23	\$335

Rick Johnstone commented that a higher capital cost combined with a lower operations and maintenance (O&M) cost may be preferable. The alternatives were ranked with consideration for the refined costs and the resulting scores are provided in the table below.

Criterium Decision + Scores	
Alternative	Score
A9 – RI/BAF	.801
A6 – RI/BAC	.776
A1 – RBF	.741

The costs and resulting scores provided in the tables above may change once we have the results of the value engineering work being done on the RBF project. The figures used for the cost analysis of Alternative 1 - RBF are based on the bid prices received in February.

### Recommendations – Bruce Long

The following recommendations were made by Black & Veatch.

- Pilot test Alternative 9 – RI/BAF process train. Summer is the most critical time of the year because we need to establish a biological population and this usually takes three to four months in the BAF. The pilot plant test will evaluate:
  - o Ozone demand and decay
  - o Bromate formation and control (We need to understand the bromide levels in the Ohio River, because bromate can form from bromide and ozone, which will be regulated in the future.)
  - o BAF loading rates, Empty Bed Contact Time (EBCT), Assimilable Organic Carbon (AOC, which is an indicator of potential for biological re-growth in the distribution system) reduction, and filtered water turbidity. (We need to determine the hydraulic loading rates and EBCT required for effectiveness.)
- Pilot one BAC filter in parallel with the BAF filter(s) to evaluate:
  - o Filtered water quality (turbidity, AOC, taste and odor)
  - o Quality versus EBCT

Black & Veatch also recommends the following:

- Reactivate the Zorn test well and begin water quality monitoring
- Determine RBF costs at B.E. Payne resulting from the Value Engineering exercise by Jordan, Jones, and Goulding Engineers
- Consider additional test wells to verify quality and quantity of the aquifer
- Verify direction to reconstituting the CHFP capacity at 180 MGD versus down-rating and constructing a new plant in the southwest or expanding the B.E. Payne Plant

#### Open Discussion and Questions – All

**Was the taste and odor incident at the water treatment plant in Michigan due to Geosmin and MIB?**

*Yes, and ozone is effective at breaking down Geosmin and MIB to eliminate taste and odor.*

**How much would ultraviolet cost?**

*Ultraviolet would cost approximately \$15 million for 180 MGD capacity.*

**Do we have a breakdown of costs for the final three options?**

*The costs for RBF were based on bids received in February and may be reduced depending on the results of the value engineering workshop. Keep in mind that only five alternatives can be scored at one time using the Criterium Decision + software. If RBF costs were reduced, this alternative would be more in line with the first two options. Power costs greatly influence the cost of ultraviolet. As of today, Black & Veatch recommends Alternative 9 –RI/BAF.*

Greg Heitzman expects to have the refined RBF costs from the Value Engineering exercise in September. Also, Bob Miller is working with Peggy Howell of Black & Veatch to provide a financial analysis using a 20 year life cycle and four percent discount rate. The analysis will consider the variable asset lives of the different technologies.

**What about a third treatment plant in the southwest?**

*Currently, LWC doesn't have water demand projections to justify the need for a third plant in the southwest at this time. This option may be reconsidered in the future if retrofitting the CHFP becomes too great of a challenge or if Fort Knox needs an expanded supply. If a plant in the southwest were possible, we could consider reducing the capacity of CHFP.*

**Since the alternatives use existing basins, would new concrete be poured?**

*No, all options are based on using existing concrete structures.*

**How many life years do we have left in the concrete at CHFP? Can we conduct a condition assessment at CHFP to ensure we are not investing in a structure that may not have enough asset life to accommodate the retrofit?**

*John Huber stated, "The real question is: In 20 years, what reinvestments would we need to make? All assets have different life cycles." We should also compare quality versus cost for granular activated carbon (GAC) and anthracite. Greg Heitzman commented that even with RBF, we still need the same footprint due to softening requirements. We could use a smaller*

*footprint, but then we would need to look at new construction scenarios. Bruce Long stated that a smaller footprint equates to less detention time, which makes staff uncomfortable because the water is so flashy. With a decreased footprint size, construction costs increase and reaction times decrease. Steve Tucker explained that keeping the basins is ideal because it allows for flexibility in the design and specifications of the plant.*

**Is the footprint for Alternative 9 – RI/BAF smaller than the footprints for Alternatives 1 and 6?**

*Yes, because we use inclined plates, which allows you to reduce the sedimentation facility by a factor of six.*

**Are there O&M cost savings with the RBF alternative?**

*Yes. Consistent water quality will reduce O&M costs (i.e. reduced manpower, chemicals, etc.). In addition, RBF will provide a more consistent water temperature (45 to 65 °F) reducing water main breaks and associated repair costs during winter months.*

**Should we issue a Request For Proposal (RFP) for preliminary and final design of Alternative 9 – RI/BAF for professional contract engineering before the pilot is done?**

*We should consider having the same engineering firm do the preliminary and final design of the project and pilot testing; this is so the engineering firm owns the data, interpretations, and construction accountability for the project.*

John Huber stated the Steering Group will need to reconvene one more time to finalize the presentation to the Board of Water Works.

Gerald Martin still has concerns regarding the weightings that were established and assigned by staff members. He also believes the differences in construction costs and the determination of the depreciable lives for the tunnels and pipelines could have a significant effect on the outcome.

Bob Miller suggested that we conduct a “run through” the software once we have final costs from the RBF value engineering study. Greg Heitzman commented that if the cost weighting is removed or reduced to a zero factor, RBF becomes top choice. A 50 to 100 percent weighting change (significant) will shift the outcome toward RBF.

**Gerald Martin asked Rick Johnstone, “What is Metro Louisville’s perspective on the options and the cost differences?”**

*Rick Johnstone replied, “We’re talking about a \$90 million difference between one option over another. We can’t eliminate cost as a factor. The Mayor wants quality water at a reasonable cost and believes in a balanced approach: considering one-third towards cost, one-third towards quality, and one-third amongst the other criteria. If we were a stockholder of a general corporation, we would want costs to be the driving factor, but because the City is the stockholder – quality become much more important.”*

Gerald Martin stated reduced O&M cost and longer depreciable lives of the major components will improve the return for the stockholder and increase the amount of funds available for dividends.

Greg Heitzman recommended that the RBF project costs be updated to reflect the results of the Value Engineering analysis by Jordan, Jones, and Goulding, which is expected to be complete in September. In addition, Black & Veatch will revise the present worth analysis to include the benefit of a longer life asset (RBF) as compared to the in-plant technologies (UV, Ozone, BAF). The potential cost savings from a reduction in water main breaks using RBF will also be evaluated. This analysis is expected to reduce the present worth spread between Alternative 1 (RBF), Alternative 9 (RI/BAF), and Alternative 6 (RI/BAC). These findings will be presented at the next Steering Group meeting planned in October.

The meeting adjourned.



**LOUISVILLE WATER COMPANY  
CRESCENT HILL FILTRATION PLANT  
ADVANCED TREATMENT TECHNOLOGY**

**Steering Group Meeting No. 6  
October 27, 2005**

**Agenda**

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|--|----------------------|
| <b>I. OPENING COMMENTS</b>   | <i>John Huber</i>    |
| <b>II. AGENDA AND MINUTES REVIEW</b>   | <i>Greg Heitzman</i> |
| <b>III. UPDATE ON OZONE TECHNOLOGY</b>   | <i>Bruce Long</i>    |
| <b>IV. REVIEW OF FINAL THREE TREATMENT OPTIONS</b>   | <i>Bruce Long</i>    |
| <ul style="list-style-type: none"><li>- A 9. RIVER INTAKE / OZONE / BAF</li><li>- A 6. RIVER INTAKE / OZONE / BAC / UV</li><li>- A 1. RIVERBANK FILTRATION</li></ul> |                      |
| <b>V. UPDATED COST INFORMATION</b>   | <i>Larry Gaddis</i>  |
| <ul style="list-style-type: none"><li>- CAPITAL, O&amp;M, AND ENGINEERING COSTS</li><li>- REVISED RANKINGS</li><li>- SENSITIVITY ANALYSIS OF ALTERNATIVES</li></ul>  |                      |
| <b>VI. PRESENT WORTH ANALYSIS</b>  | <i>Bob Miller</i>    |
| <b>VII. RECOMMENDATIONS</b>  | <i>Bruce Long</i>    |
| <ul style="list-style-type: none"><li>- OZONE / BAF PILOT TESTING AND PRELIMINARY ENGINEERING</li><li>- RBF WELL TESTING AND PRELIMINARY ENGINEERING</li></ul>       |                      |
| <b>VIII. OPEN DISCUSSION AND QUESTIONS</b>   | <i>All</i>           |



## **Steering Group Meeting No. 6**

### **Louisville Water Company**

#### **Crescent Hill Filtration Plant Advanced Treatment Study**

**October 27, 2005**



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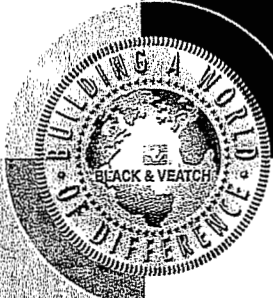
## **Opening Comments**

**John Huber**




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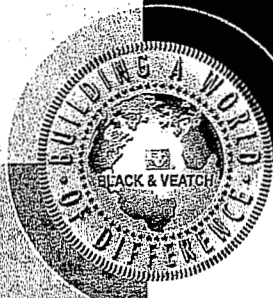


# Agenda and Minutes Review

**Greg Heitzman**




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# Ozone Treatment Processes

**Bruce Long**

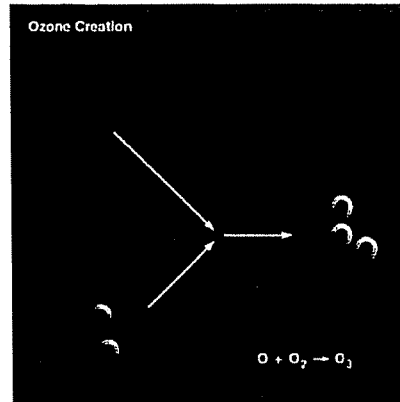


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## What is Ozone?

- Unstable form of oxygen
- Naturally produced by:
  - Lightning, ultraviolet light
  - $O_2 + \text{energy} \rightarrow O + O$
  - $O + O_2 \rightarrow O_3$

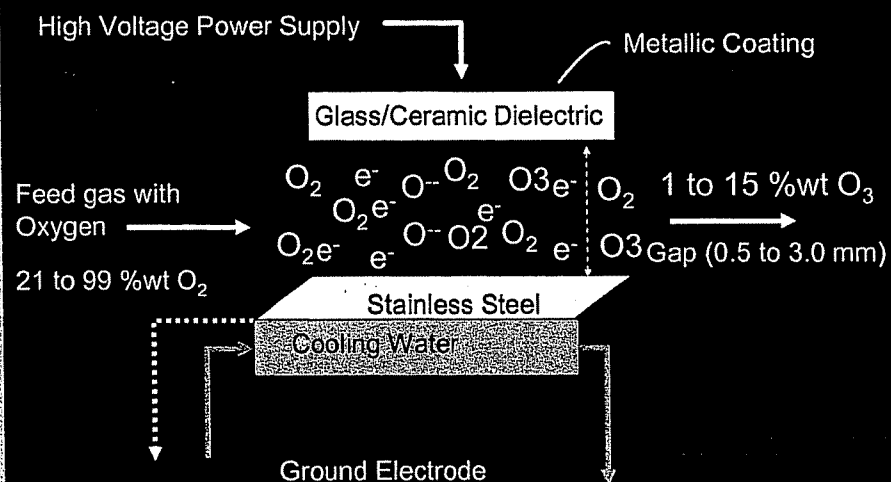


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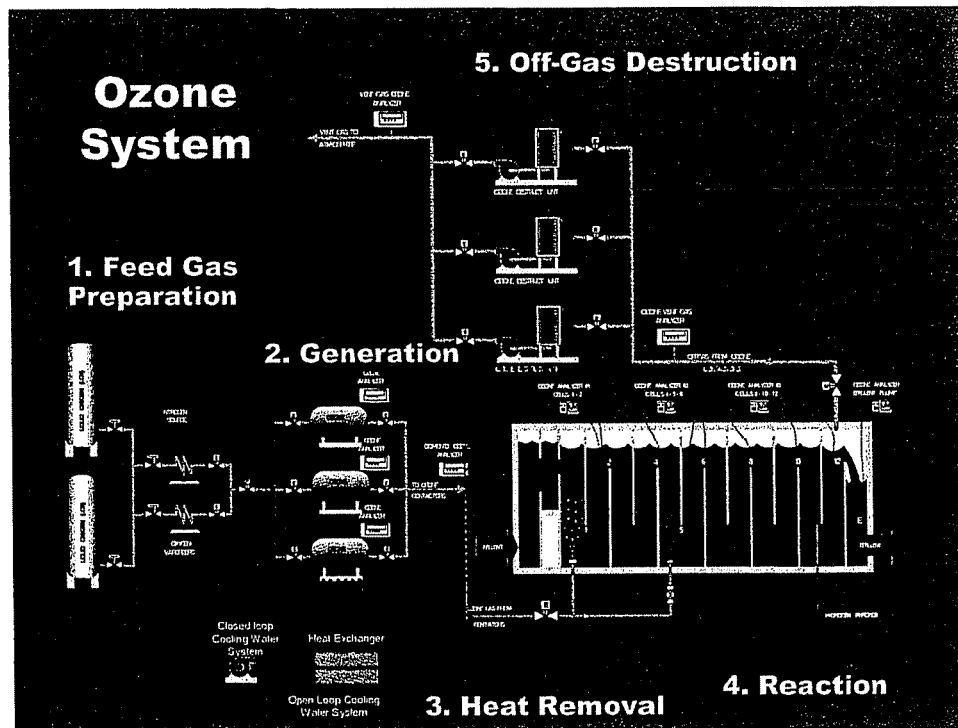



## Ozone Generation Principles



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## Why is Ozone Used in Drinking Water Treatment?

- Taste and odor control (MIB, geosmin)
- Oxidation of reduced inorganics (Fe, Mn, S)
- Color removal (NOM)
- Disinfection (bacteria, viruses, protozoa)
- Reduce formation of regulated DBPs
- Oxidation of SOC's (solvents, pesticides, EDCs)
- Microflocculation (filtration impacts)
- Biofiltration enhancement



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## Removal of Ozonation Byproducts

- Biological Filters
  - Anthracite (sand) = BAF
  - GAC (w or w/o sand) BAC
- Removes AOC (aldehydes, carboxylic acids, ketones, etc.)
  - Target is:  
Finished water AOC < influent AOC
- Key design parameter is EBCT (>5 min.)
- BAF/BAC not yet approved by KDOW

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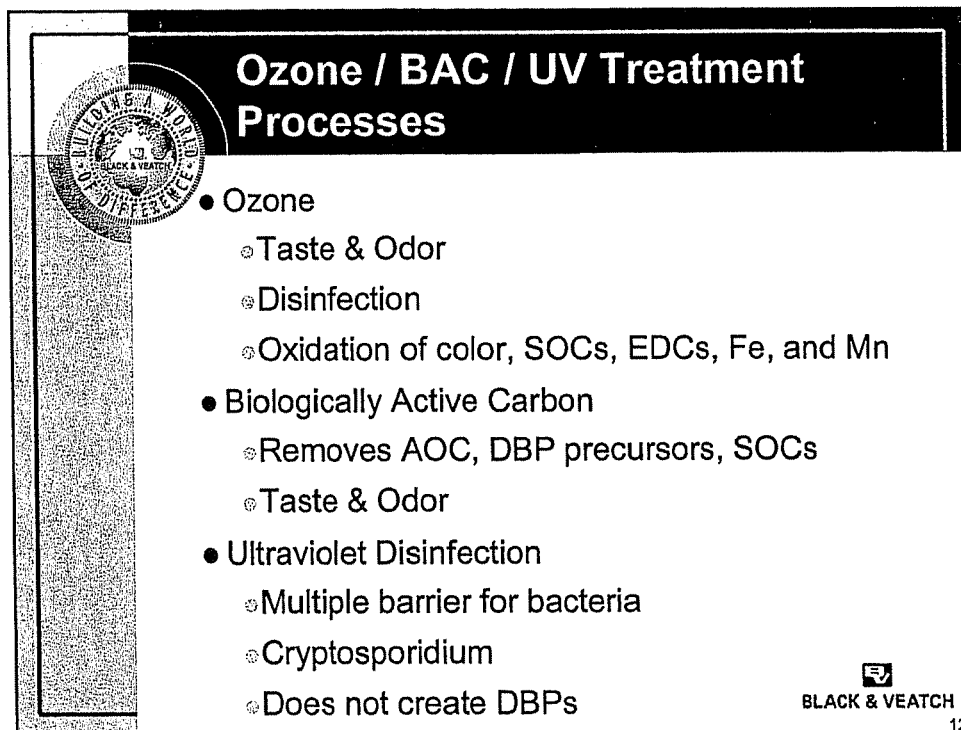
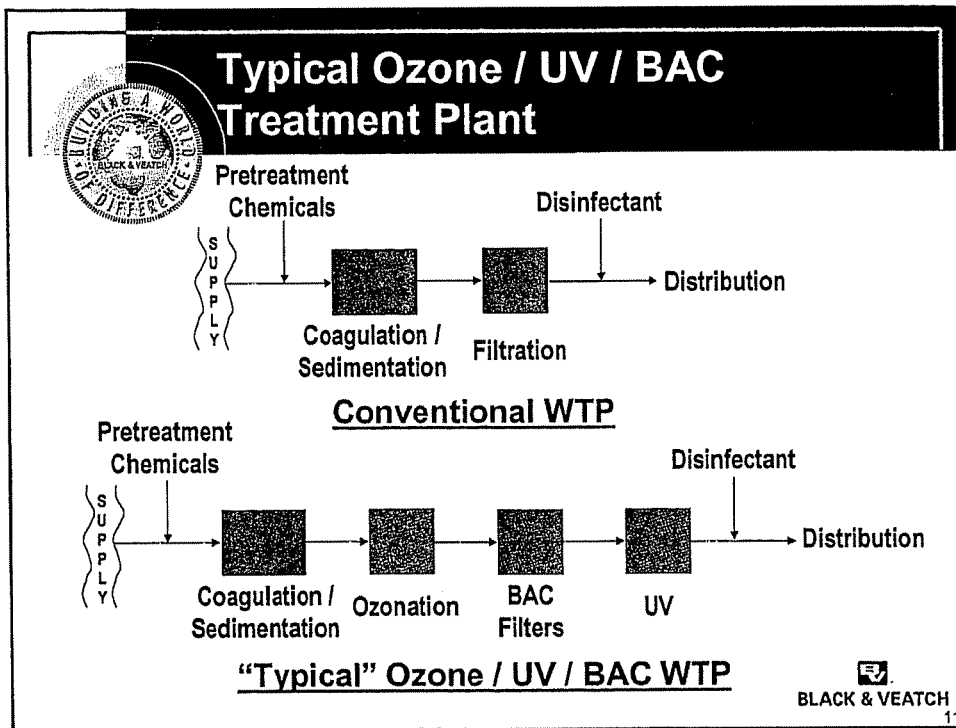


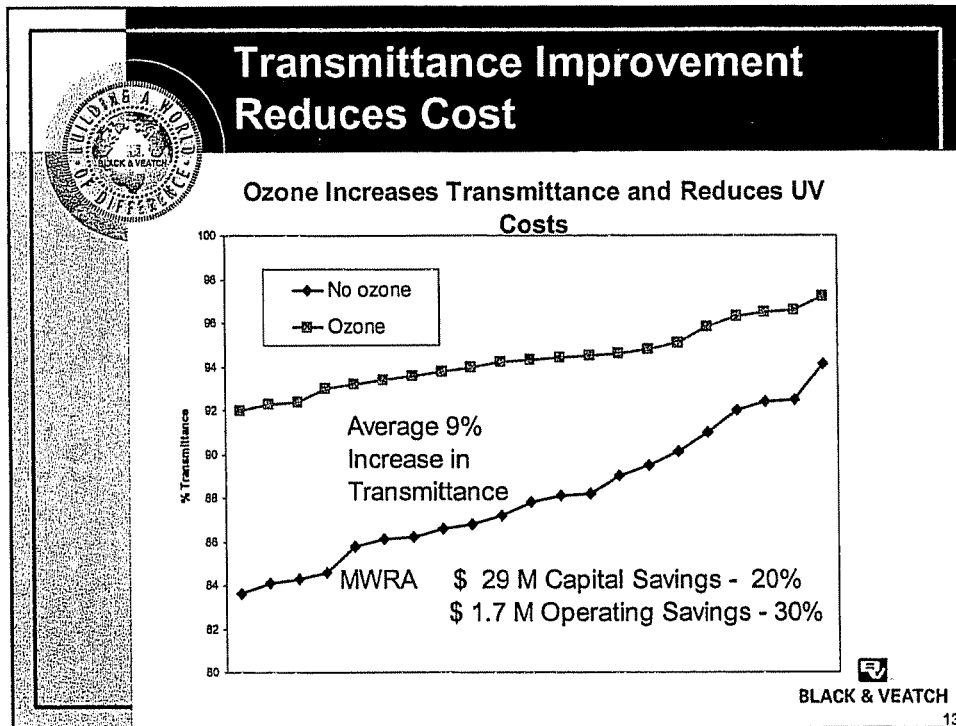
## Who uses Ozone in Drinking Water Treatment?

- 209 plants in operation or design in US
- 187 plants in service by 2005
- 25 treat surface waters with > 100 MGD capacity
  - Passaic Valley, NJ (120 mgd on Passaic River)
  - Water Works II, Detroit, MI (240 mgd on Detroit River)
  - Elm Fork, Dallas, TX (330 mgd on Trinity River -raw)
  - SNWS (600 and 300 mgd – Lake Mead raw)
- Fargo, ND - ozone after lime softening on river supply

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- ## Challenges Associated With Possible Use of Ozone
- KDOW approval of BAF/BAC
  - Accuracy of capital and operating costs
    - Sharpened by bench and pilot-scale testing
      - Quantify demand and decay at different times of the year
      - Verify positive / negative impacts on upstream and downstream treatment processes
  - Acceptance by staff – pilot testing and training are key – operators, maintenance staff
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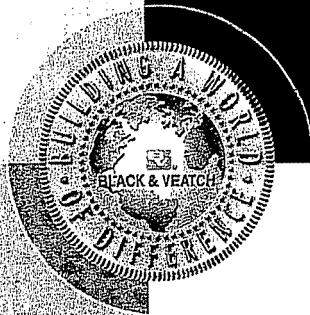
## Summary

- Ozone is applied to achieve multiple purposes concurrently
- Bromate is the only regulated byproduct – 10 ug/L may be suspect
- There are KDOW issues to be addressed through pilot plant testing
- The use of O<sub>3</sub> for LWC is unique for large river plants – but is considered because you have “raised the bar”



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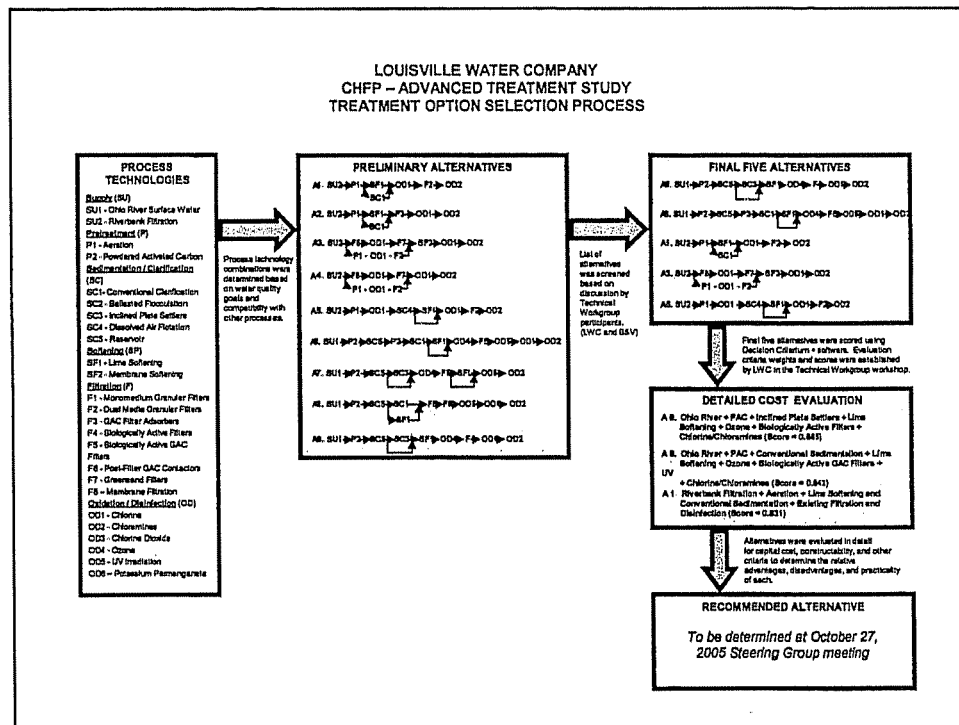
## Review of Final Three Alternatives


**Bruce Long**



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## How Did We Arrive at the Final Three Alternatives?

- Established Water Quality Goals
- Evaluated Applicable Regulations
- Determined Compliance Ability of CHFP
- Selected Multiple Feasible Treatment Options
- Evaluated the Alternatives Using Decision-Facilitating Software



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## Challenges to Equal B.E. Payne Finished Water Quality

- Microbials – inactivation/removal
- T&O reduction
- Equivalent DBPs
- Equivalent AOC
- SOC<sub>s</sub>
- Nuisance organisms (zebra mussels, asiatic clams)
- Emerging contaminants
- Public perception
- Consistency

  
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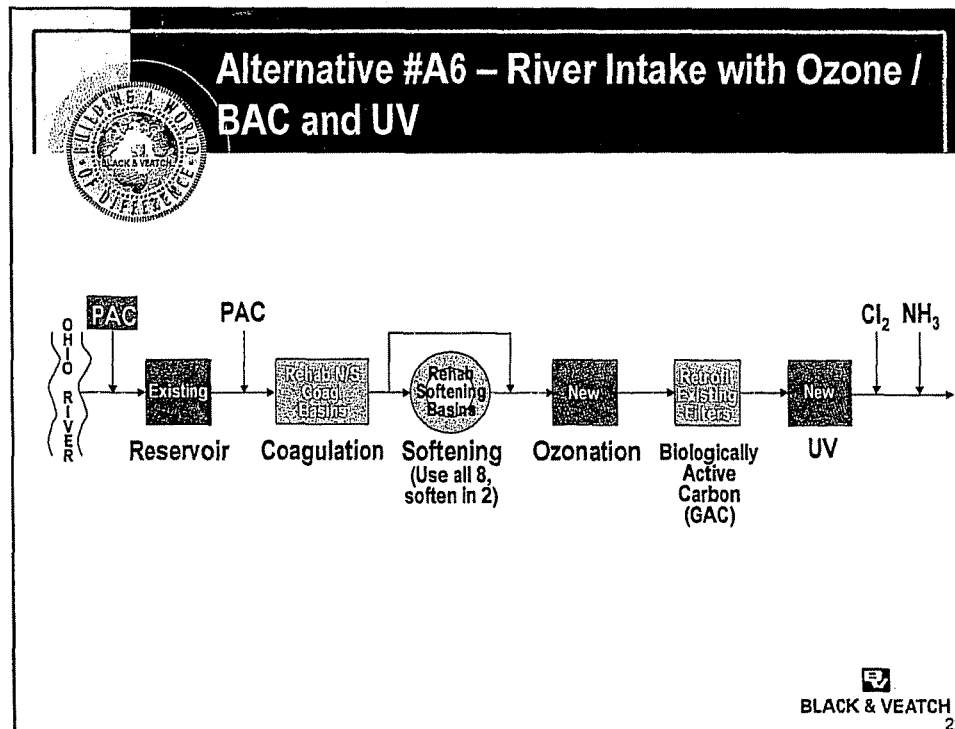
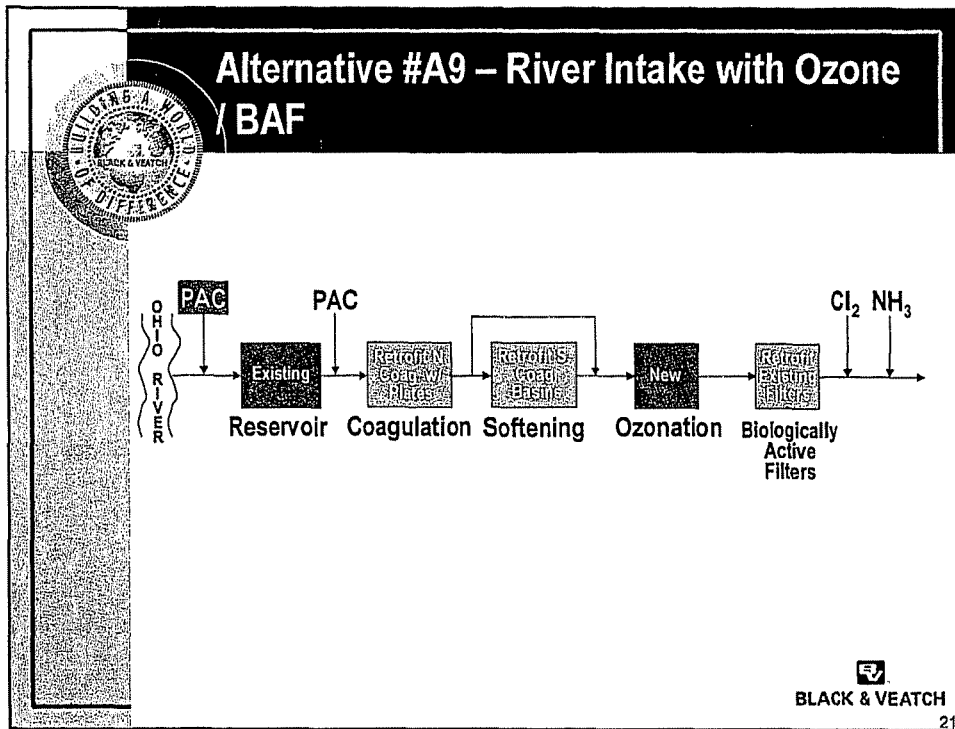


## Based On DCP Analysis, Final Three Alternatives Were Determined To Be:

- A9 - River Intake with Ozone and BAF
- A6 - River Intake with Ozone, BAC and UV
- A1 - RBF with Granular Media Filtration

  
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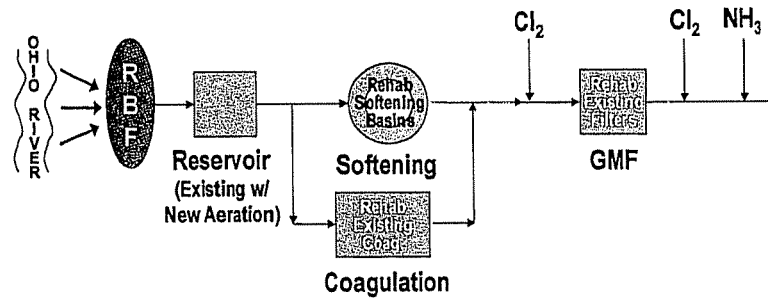
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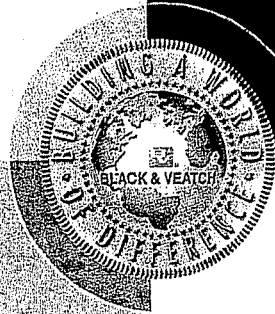




## Alternative #A1 – RBF with Granular Media Filtration



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## Updated Cost Information

Larry Gaddis

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## Cost Adjustments

- Alt. A1 – RBF
  - ⦿ Capital cost revisions
  - ⦿ Added “Potentially Gassy” option
- All three alternatives:
  - ⦿ Updated / revised O&M costs
  - ⦿ Added LWC PM costs
  - ⦿ Included 15% engineering costs

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## Simple Cost Comparison for Final Three Alternatives:

<u>Alternative</u>	<u>Cost (Million \$)</u>	
	<u>Capital Cost</u>	<u>O&amp;M</u>
A9 – RI with BAF	\$159	\$7.68
A6 – RI with BAC/UV	\$141	\$9.23
A1 – RBF (Gassy)	\$262	\$7.06
A1 – RBF (Potentially Gassy)	\$233	\$7.06

A9 and A6 Capital Costs include 20% contingencies  
A1 options Capital Costs include 25% contingencies

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## Treatment Option Evaluation Criteria

- Cost 0.35
  - Capital Cost 0.45 = 15.75% of total
  - O&M Cost 0.45 = 15.75% of total
  - Depreciated Assets 0.10 = 3.5% of total
- Finished Water Quality 0.35
- Operational Considerations 0.30
- Social / Environmental Issues 0.05
- Other Considerations 0.05

  
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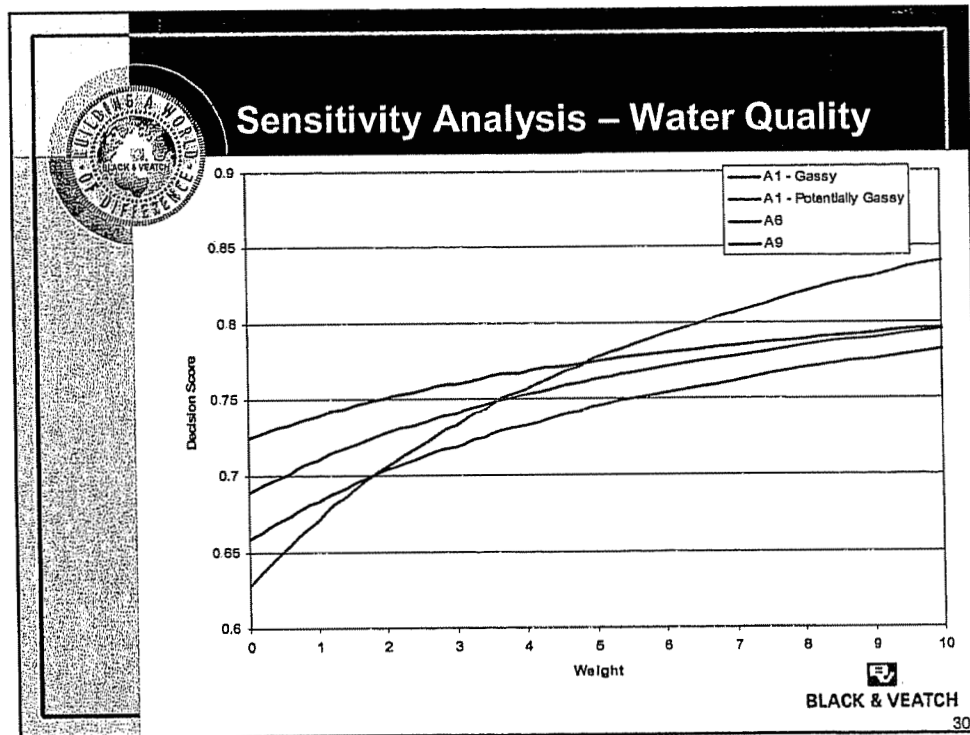
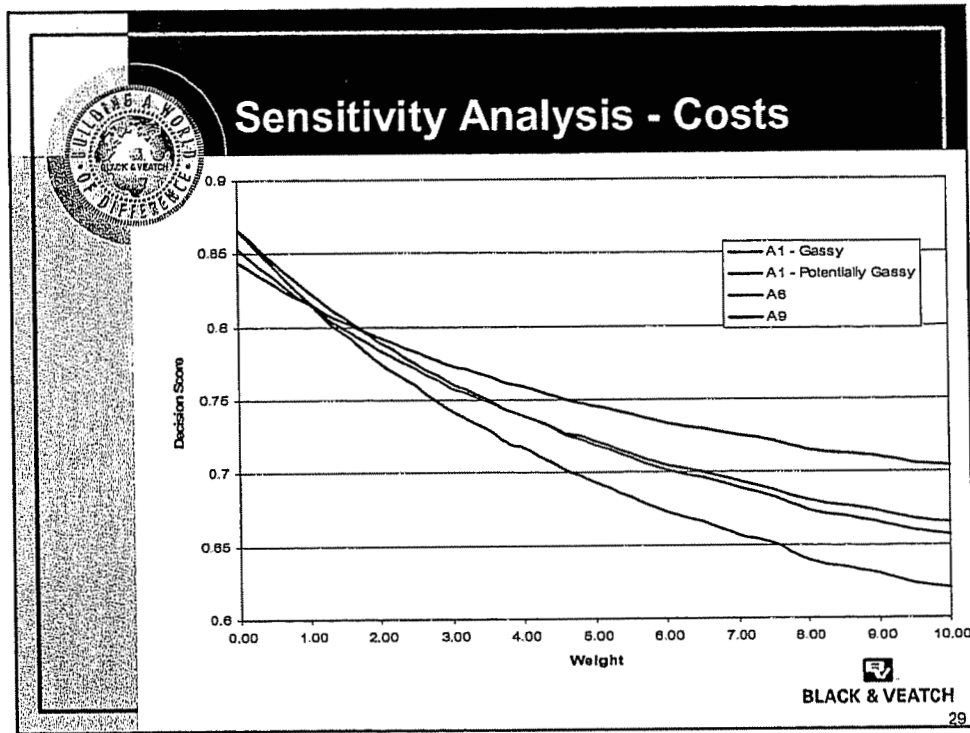
## Based on Revised Costs the Relative Rankings Become:

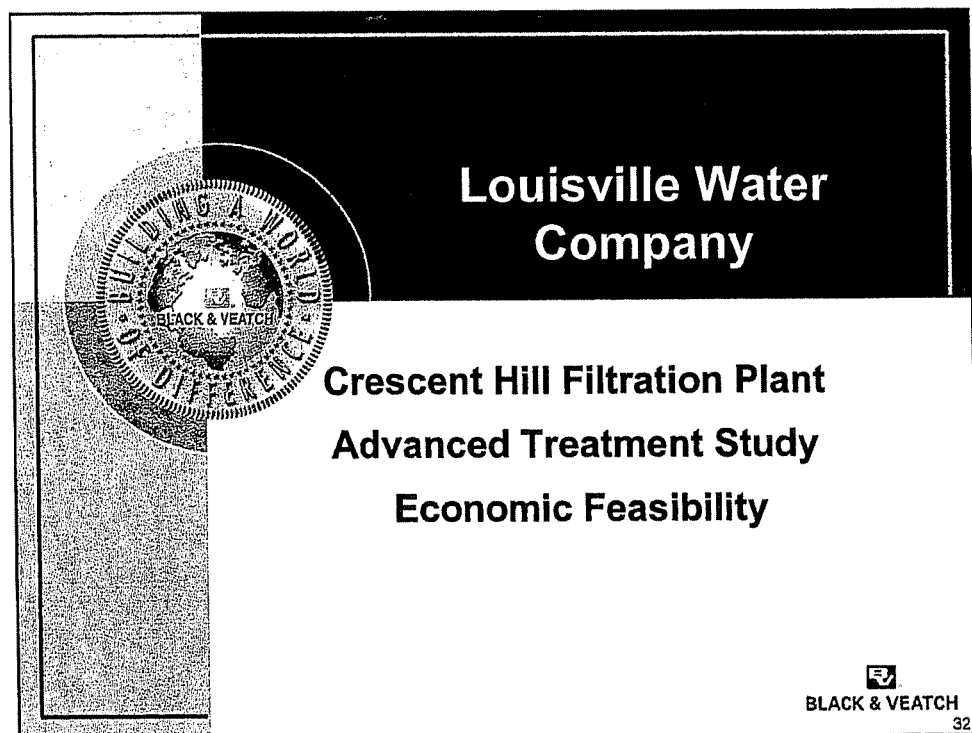
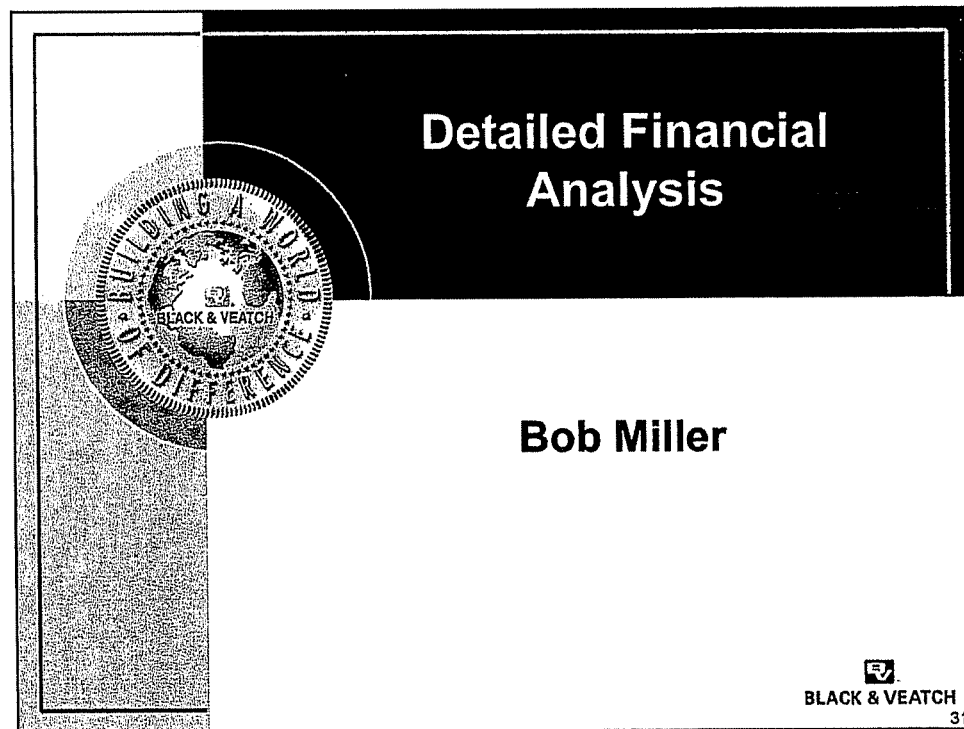
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|------------------------------|-------|
| A9 - RI with BAF             | 0.765 |
| A6 - RI with BAC/UV          | 0.747 |
| A1 - RBF (Gassy)             | 0.728 |
| A1 - RBF (Potentially Gassy) | 0.748 |

- Based on Capital and O&M costs only,  
Present Worth not included

  
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## Changes since the August 16 Presentation

- RBF cap-ex estimate has increased
- RBF scenarios for gaseous and potentially gaseous environments have been developed
- Consulting engineering for all projects has been included at 15% of capital cost
- O&M has changed slightly



## Additions since the August 16 Presentation

- Inclusion of recurring revenue-financed routine capital
- Inclusion of replacement cap-ex
- Inclusion of salvage value
- Inclusion of savings from fewer main break repairs for RBF options



## Basic Assumptions

### Initial Capital Investment - \$ millions

	Pump					RBF	
	Station	Large	Small	Buildings /		Tunnels &	Total
	Equip.	Equip.	Equip.	Structures	Piping	Wells	Cost
A1 RBF Potentially Gassy	5.32	26.82	2.99	42.23	18.73	136.30	232.39
A1 RBF Gassy	5.27	26.82	2.89	42.12	18.71	165.68	261.59
A6 RI/BAC	8.05	52.80	5.87	50.60	23.10	-	140.32
A9 RI/BAF	8.05	62.40	6.94	58.67	22.68	-	158.74

Depreciable Lives - yrs	25	25	7	40	100	100	
Inflation Factor (HW 5 yr)	3.79%	3.10%	3.10%	4.03%	3.04%	3.04%	

Note: Small Equipment is estimated to be 10% of total equipment (excl pump station)

### Recurring Operating Expenses - \$ millions

	Maint.		Labor	Chemicals	UV Patent		GAC Replace	Savings	Total
	Materials	Power			Fee				
A1 RBF	0.39	2.49	2.34	1.84	n/a	n/a	(0.29)	6.77	
A6 RI/BAC	0.59	2.24	2.34	3.01	0.60	0.45	n/a	9.23	
A9 RI/BAF	0.43	2.17	2.07	3.01	n/a	n/a	n/a	7.68	
Inflation Factors	2.0%	4.0%	3.0%	4.0%	3.0%	3.0%	3.0%		

Note: Savings range for RBF is \$192k min, \$286k avg, \$365k max

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## Project Evaluation Results

20-Year Discounted Costs					30-Year Discounted Costs				
	Capital	Operating	Residual	Total	Capital	Operating	Residual	Total	
Less Gassy A1 RBF w/\$286k Savings	\$ 237	\$ 171	\$ (60)	\$ 348	\$ 262	\$ 235	\$ (44)	\$ 453	
Gassy A1 RBF G w/\$286k Savings	\$ 267	\$ 175	\$ (70)	\$ 372	\$ 291	\$ 239	\$ (49)	\$ 482	
A6 Ozone & UV	\$ 150	\$ 210	\$ (23)	\$ 337	\$ 197	\$ 290	\$ (35)	\$ 452	
A9 Ozone	\$ 170	\$ 204	\$ (25)	\$ 349	\$ 225	\$ 282	\$ (40)	\$ 467	

### • Project Evaluation – Classic Approach

- Includes initial cap-ex, op-ex, offset by RBF benefits, salvage value, combined with a PV factor of 5%
- Also Includes allowance for routine capital (used depreciation as proxy), and also includes reinvestment capital

- Potential benefits of \$286k annually have been Included to recognize reduced main breaks expected from more stable water temperature in RBF scenario

Note: Capital costs include replacement capital. Operating cost includes O&M, routine capital, & any applicable savings.

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## Project Evaluation Analysis Details

	Years										30-Year	30-Year	20-Year
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	Total	PV @ 5%	PV @ 5%
<b>A1: RBF Potentially Gassy</b>													
Initial Capital	232.39	-	-	-	-	-	-	-	-	-	232.39	232.39	232.39
Replacement Capital	-	-	-	-	-	3.70	4.58	-	5.88	78.05	92.01	28.75	4.95
Total Capital	232.39	-	-	-	-	3.70	4.58	-	5.88	78.05	324.40	262.14	237.34
Routine Repair/Repl (Depr as proxy)	3.93	3.92	3.91	3.91	3.90	19.66	19.75	19.97	20.32	28.35	127.82	66.11	51.55
Plant O&M	7.06	7.31	7.57	7.84	8.12	45.18	53.89	64.32	78.84	91.86	370.00	178.24	124.43
Operating Savings	(0.29)	(0.30)	(0.31)	(0.32)	(0.33)	(1.78)	(2.07)	(2.40)	(2.78)	(3.22)	(13.80)	(6.87)	(4.86)
Total O&M	10.70	10.93	11.18	11.43	11.69	63.05	71.56	81.89	94.38	118.69	483.82	234.68	171.11
Subtotal Capital & O&M	243.09	10.93	11.18	11.43	11.69	66.75	78.15	81.89	100.06	195.04	808.22	495.82	408.45
Residual Value								(152.28)		(180.96)	(180.96)	(43.88)	(50.25)
Total	243.09	10.93	11.18	11.43	11.69	66.75	78.15	(70.39)	100.06	14.08	627.26	452.86	348.20
<b>A1: RBF Gassy</b>													
Initial Capital	261.59	-	-	-	-	-	-	-	-	-	261.59	261.59	261.59
Replacement Capital	-	-	-	-	-	3.70	4.58	-	5.88	77.92	91.88	29.71	4.95
Total Capital	261.59	-	-	-	-	3.70	4.58	-	5.88	77.92	353.47	291.30	266.54
Routine Repair/Repl (Depr as proxy)	4.22	4.21	4.20	4.20	4.19	21.11	21.20	21.42	21.77	29.75	136.27	70.78	55.34
Plant O&M	7.06	7.31	7.57	7.84	8.12	45.18	53.89	64.32	78.84	91.86	370.00	178.24	124.43
Operating Savings	(0.29)	(0.30)	(0.31)	(0.32)	(0.33)	(1.78)	(2.07)	(2.40)	(2.78)	(3.22)	(13.80)	(6.87)	(4.86)
Total O&M	10.99	11.22	11.47	11.72	11.98	64.50	73.01	83.34	95.83	118.69	492.47	238.35	174.91
Subtotal Capital & O&M	272.58	11.22	11.47	11.72	11.98	68.20	77.89	83.34	101.51	198.31	845.94	530.65	441.44
Residual Value								(175.88)		(201.39)	(201.39)	(48.93)	(59.51)
Total	272.58	11.22	11.47	11.72	11.98	68.20	77.89	(92.31)	101.51	(5.07)	644.55	481.73	371.93

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## Project Evaluation Analysis Details (cont.)

	Years										30-Year	30-Year	20-Year
	0	1	2	3	4	5-9	10-14	15-19	20-24	25-29	Total	PV @ 5%	PV @ 5%
<b>A6: Ozone &amp; UV</b>													
Initial Capital	140.32	-	-	-	-	-	-	-	-	-	140.32	140.32	140.32
Replacement Capital	-	-	-	-	-	7.27	9.00	-	11.14	147.47	174.88	58.70	9.71
Total Capital	140.32	-	-	-	-	7.27	9.00	-	11.14	147.47	315.20	197.03	150.03
Routine Repair/Repl (Depr as proxy)	3.72	3.69	3.67	3.64	3.61	18.24	18.10	18.20	18.37	32.87	124.12	62.84	47.73
Plant O&M	9.23	9.55	9.89	10.24	10.60	58.65	70.02	83.38	99.37	118.53	479.86	227.58	161.93
Operating Savings	-	-	-	-	-	-	-	-	-	-	-	-	-
Total O&M	12.95	13.25	13.56	13.88	14.21	77.09	88.12	101.58	117.75	151.40	603.78	290.42	209.87
Subtotal Capital & O&M	153.27	13.25	13.56	13.88	14.21	84.36	97.12	101.58	128.69	269.87	918.98	487.45	359.70
Residual Value								(57.29)		(145.74)	(145.74)	(35.41)	(22.87)
Total	153.27	13.25	13.56	13.88	14.21	84.36	97.12	44.29	128.69	153.12	773.24	452.04	337.03
<b>A9: Ozone</b>													
Initial Capital	158.74	-	-	-	-	-	-	-	-	-	158.74	158.74	158.74
Replacement Capital	-	-	-	-	-	8.59	10.84	-	13.18	170.58	202.99	85.93	11.48
Total Capital	158.74	-	-	-	-	8.59	10.84	-	13.18	170.58	361.73	244.67	170.22
Routine Repair/Repl (Depr as proxy)	5.08	5.07	5.06	5.05	5.04	25.80	26.31	27.19	28.31	45.98	178.91	89.98	67.84
Plant O&M	7.88	7.99	8.25	8.55	8.88	49.35	59.03	70.68	84.85	101.48	406.45	192.11	138.08
Operating Savings	-	-	-	-	-	-	-	-	-	-	-	-	-
Total O&M	12.76	13.03	13.31	13.60	13.90	75.15	85.34	97.85	112.98	147.45	585.35	282.08	204.00
Subtotal Capital & O&M	171.50	13.03	13.31	13.60	13.90	83.74	95.98	97.65	126.14	318.03	847.08	506.78	374.23
Residual Value								(62.91)		(185.38)	(185.38)	(40.18)	(24.90)
Total	171.50	13.03	13.31	13.60	13.90	83.74	95.98	34.94	126.14	152.65	781.70	466.57	349.33

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## Next Steps

### Black & Veatch

- Incorporate retirement of existing facility assets
- Incorporate incremental O&M expenses & evaluate effect on long-range financial plan for each alternative
- Provide written summary of analysis

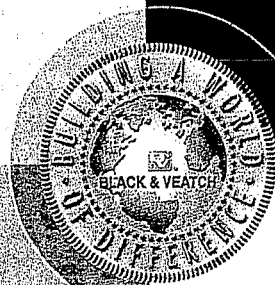
### Louisville Water Company

- Qualitative Risk Assessment of each alternative



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## Recommendations

**Bruce Long,  
Larry Gaddis,  
&  
Greg Heitzman**



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## Recommendations Preliminary Engineering A1 and A9

- Initiate preliminary engineering for Alternatives A1 – RBF and A9 – Ozone BAF, concurrently
- Evaluation of CHFP
  - Details of incorporating new or modified processes (RBF, Ozone, BAF, BAC)
  - Evaluate condition of existing structures and critical infrastructure connections between processes
  - Evaluate construction sequence and schedule
  - Validate cost projections

  
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## Recommendations A1 – RBF Preliminary Engineering

- Reactivate Zorn test well and install new test wells
- Conduct water quality monitoring of the test wells
- Conduct modeling to confirm aquifer yield
- Conduct geotechnical analysis and core drilling for natural gas
- Evaluate tunnel alignment options and well connections
- Evaluate integration with Zorn Pumping Station
- Validate cost projections

  
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## Recommendations

### A9 – BAF Pilot Testing

- Pilot testing of A9 – BAF process train:
  - ⦿ Ozone demand and decay
  - ⦿ Bromate formation and control
  - ⦿ BAF
  - ⦿ Pilot 1 BAC filter parallel with BAF filter(s)
- Evaluate the integration of new processes into exiting treatment train


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## Preliminary Engineering


### Cost Estimates

- Preliminary Engineering for CHFP
  - ⦿ A1 and A9 - \$350,000 estimate
- A1-RBF Preliminary Engineering
  - ⦿ Phase I - \$1.5 million estimate
  - ⦿ Phase II - \$3.0 million estimate
- A9-Pilot Plant Testing
  - ⦿ BAF Pilot Plant - \$250,000 to \$500,000 estimate
  - ⦿ Engineering Assistance - \$150,000 estimate

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# Discussion



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# **Louisville Water Company**

## **Minutes**

### **Crescent Hill Advanced Treatment Technology Steering Group**

**October 27, 2005**

**Present:** Kay Ball, Larry Gaddis (Black & Veatch), Amber Halloran, Greg Heitzman, John Huber, Rick Johnstone, Wolfgang Kuehn (Visitor from DVGW - the Technical and Scientific Association for Gas and Water in Karlsruhe, Germany), Susan Lehmann, Bruce Long (Black & Veatch), Gerald Martin, Bob Miller, Jim Smith, Jack Wang, and Joe Wise.

**Absent:** Karla Teasley and Marita Willis.

#### Opening Comments – John Huber

John Huber thanked everyone for coming to the meeting. John explained that Marita Willis was not able to attend this meeting and Greg Heitzman will meet with her later to brief her on the outcomes. This meeting will continue to further clarify the methodology used to develop the treatment alternatives we have to consider.

#### Agenda and Minutes Review – Greg Heitzman

Greg Heitzman asked Bruce Long to provide a brief introduction to our visitor, Wolfgang Kuehn. Mr. Kuehn is interested in observing our Riverbank Filtration (RBF) project to gather data for inclusion in his extensive RBF research.

Greg Heitzman distributed minutes from the August 16 meeting, the meeting agenda, and a copy of the PowerPoint presentation from Black & Veatch. Copies of these documents will be filed with the October 27 minutes. Greg Heitzman reviewed the minutes and suggested revisions from Gerald Martin to the fifth page. The first revision appears in the second sentence of the sixth paragraph, which is revised to read: "He also believes the differences in construction costs and the determination of the depreciable lives for the tunnels and pipelines could have a significant effect on the outcome." The second revision appears in the ninth paragraph and is revised to read: "Gerald Martin stated reduced O&M cost and longer depreciable lives of the major components will improve the return for the stockholder and increase the amount of funds available for dividends." With these revisions, the August 17 minutes were approved.

Greg provided a summary of the meeting agenda and introduced the first topic: ozonation.

#### Update on Ozone Technology – Bruce Long

Bruce Long briefly reviewed what ozone is and why it is included in two of our top three alternatives. Ozone is a very reactive, unstable form of oxygen. If you take oxygen, add energy to it, you end up with tri-atomic oxygen, or ozone (O<sub>3</sub>). We do this by feeding oxygen through a

dielectric gap, where energy is applied. One to 15 percent of the resulting oxygen will produce ozone. In the past, dry air was fed through the ozone generator. We now use liquid oxygen and vaporize it. Heat removal with the cooling water is critical to maintain the resulting ozone. The system is more operator friendly than in past years.

**Is heat a by-product of ozone generation?**

*Waste heat is the by-product of ozone generation. We use the cooling water to reduce the heat.*

**What is the temperature of the by-product water? Is it hot enough for steam generation?**

*No, our goal is to have the by-product water cooled enough to be less than or equal to 90 degrees Fahrenheit. However, the waste heat is then used in the vaporizer.*

Ozone is effective at taste and odor control, resulting from MIB and geosmin; oxidation of reduced inorganics, such as iron, manganese, and sulfur; color removal, resulting from natural organic matter (NOM); disinfection of bacteria, viruses, and protozoa; reduced formation of regulated disinfection by-products (DBPs); oxidation of synthetic organic chemicals (SOCs), such as solvents, pesticides, and endocrine-disrupting compounds (EDCs); microflocculation; and biofiltration enhancement. Ozone typically improves filter performance by increasing loading rates to as much as 10 gallons per square foot compared to three gallons per square foot.

Bromate is the only regulated byproduct that may be of concern. The current standard allows up to 10 micrograms per liter (ug/L). Bromate is formed from bromide and ozone. Bromate was found to be highly carcinogenic based on a study done in Japan. However, current research shows the acids in the stomach are strong enough to destroy bromate. The question here is: will the World Health Organization (WHO) raise the standard to allow a higher amount of bromate in the water?

**Is there an agency that will not relax a standard once established, even if it makes sense to do so?**

*Yes, the Safe Drinking Water act will not allow an existing standard to be relaxed.*

Biological filters are used to remove ozonation by-products from the water. There are two types of filters we are considering; a Biologically Active Filter (BAF) which uses anthracite with sand or Biological Activated Carbon (BAC) which uses granular activated carbon (GAC) with or without sand. These filters can remove assimilable organic carbons (AOCs), such as aldehydes, carboxylic acids, and ketones. The target is to have less AOCs in the finished water than we do in the source water. When chlorine is used, AOCs tend to be higher in the treated water than in the raw water. Currently, the Kentucky Division of Water (KDOW) has not approved BAF or BAC filtration; largely because KDOW does not have enough information about them for consideration. Bruce Long strongly recommends LWC engage KDOW in pilot testing to keep them informed and to educate them on the effectiveness of these treatment processes.

There are 209 water treatment plants that use or plan to use ozone in the United States. 187 of these plants are in service as of 2005. Further, 25 of these plants treat surface waters with capacity greater than 100 MGD.

Considering a conventional water treatment plant, ozone is typically used after the coagulation and sedimentation process. Typically, ozonation is followed by BAC filters and then Ultraviolet (UV) disinfection. BAC removes DBP precursors, SOCs, and taste and odor. UV provides a multiple barrier for bacteria, inactivates Cryptosporidium, and does not create DBPs. Ozone is added at the highest water quality step in the process, which reduces costs.

On average, ozone increases UV transmittance by nine percent, thus reducing UV operating costs. Transmittance is the amount of UV light that passes through the water. The higher the transmittance, the less energy it takes to power the UV generation.

The accuracy of capital and operating costs will increase as we determine ozone demand and decay at different times of the year and the positive and/or negative impacts on up- and downstream treatment processes.

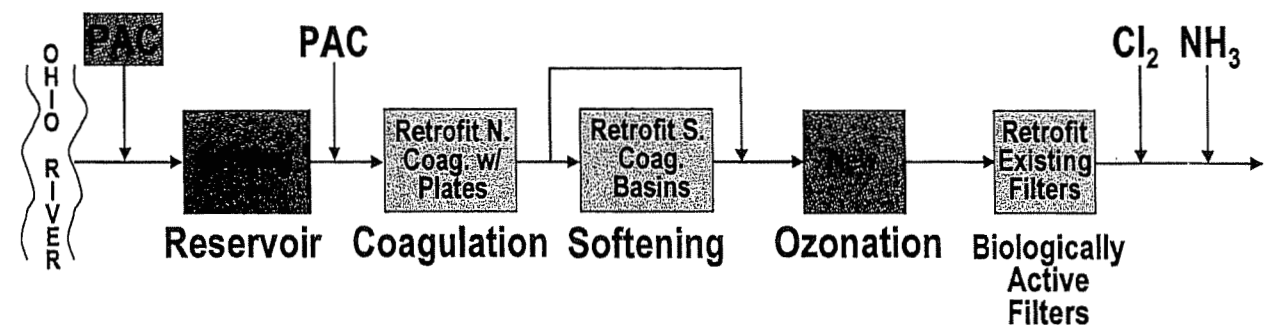
As with any new process, operations and maintenance staff must be trained on the new technology. Bruce recommends LWC staff be engaged in pilot testing and training. The greater understanding staff members have about the new processes, the greater their acceptance level will be.

#### Review of Final Three Treatment Options – Bruce Long

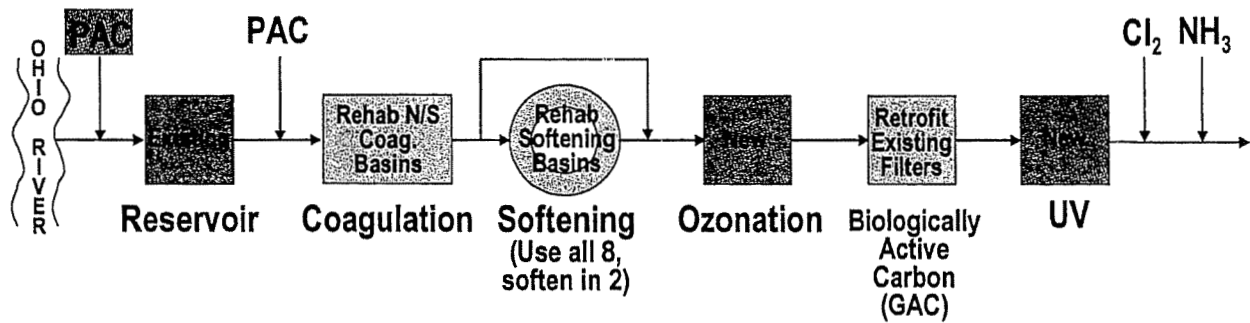
Bruce reviewed the selection process that resulted in the three alternatives recommended for further consideration. Initially, nine alternatives were scrutinized considering LWC's established water quality goals, applicable regulations, and the compliance ability of the Crescent Hill Filter Plant (CHFP). Five feasible treatment options were selected by the Technical Workgroup and then scored using the Decision Criterium + software, which uses criteria weightings and scores established by the Technical Workgroup. Challenges of achieving finished water quality equal to that of B.E. Payne were also considered. The final three alternatives resulting from this process, in order of highest score to lowest are: Alternative 9 (A9) – River Intake with Ozone and BAF; Alternative 6 (A6) – River Intake with Ozone, BAC and UV; and Alternative 1 (A1) – RBF with Granular Media Filtration.

A9 and A6 combine existing processes, rehabilitated and/or retrofitted processes, and new processes. A1 combines rehabilitated and retrofitted processes and new processes. The diagrams for these alternatives are provided below.

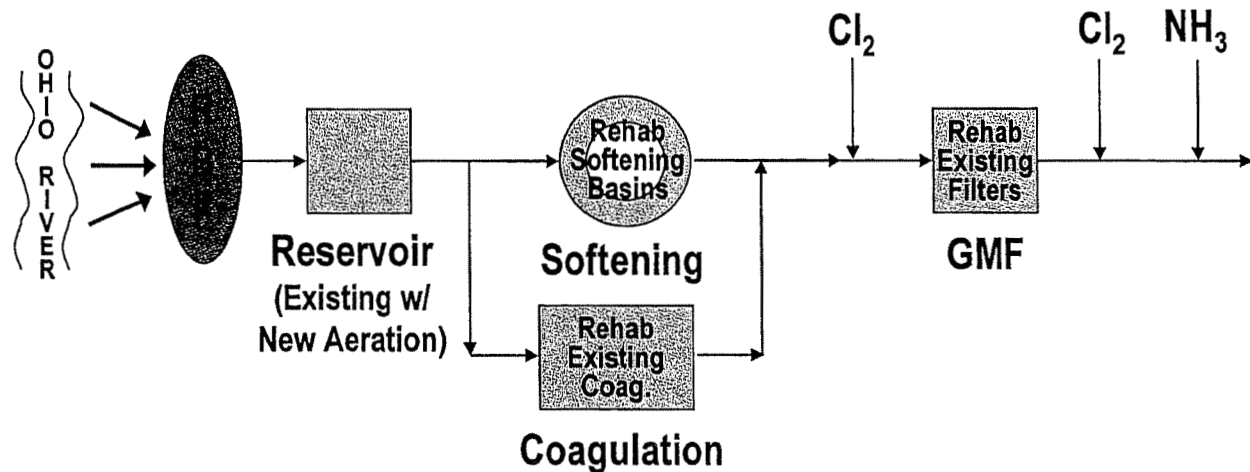
#### **A9 – River Intake with Ozone and BAF**



## A6 – River Intake with Ozone, BAC and UV



## A1 – RBF with Granular Media Filtration



### Updated Cost Information -- Larry Gaddis

Larry Gaddis briefed the group on cost adjustments made to the final three alternatives. As a result of the Value Engineering exercise, capital cost revisions were made to A1. Furthermore, capital costs will vary depending on whether the tunnel work required for A1 is classified as gassy or potentially gassy. For this reason, two versions of A1 will be considered.

**The boring done on one side of Harrod's Creek was determined gassy. Have new borings been done staying on the opposite side of Harrod's Creek?**

*No, not yet. The borings will be complete in December.*

Updated and/or revised operation and maintenance (O&M) costs and additional LWC Project Management (PM) costs have been included for all three alternatives. Also, 15 percent in engineering costs have been included for the A6 and A9 alternatives and the work at CHFP for the A1 alternative, in order to match the cost methodology for the RBF supply. A simple cost comparison, which includes the aforementioned cost adjustments, of the final three alternatives is summarized in the table below.



Simple Cost Comparison of Final Three Alternatives Cost (Million \$)		
Alternative	Total Capital Cost	O&M (per year)
A9 – Ozone/BAF	\$159	\$7.68
A6 – Ozone/BAC/UV	\$141	\$9.23
A1 – Gassy	\$262	\$7.06
A1 – Potentially Gassy	\$233	\$7.06

A9 and A6 O&M costs are based on an average day assumption and that these alternatives require more energy to power them: the O&M costs for A9 and A6 did not change. The O&M costs for A1 will be reduced some because the costs are based on maximum day production. Black & Veatch will adjust these costs to be consistent with A6 and A9 alternatives. A9 and A6 capital costs include 20 percent contingencies. Both versions of A1 capital costs include 25 percent contingencies; because of the higher degree of risk due to the geology.

The evaluation criteria weightings were updated considering the revised capital and O&M costs. The Decision Criterium + software will normalize the weightings to 1.0. The new evaluation criteria weightings are provided in the table below.

Revised Evaluation Criteria Weightings	
Criteria	Weighting
Cost	0.35
- Capital Cost	- 0.45 (15.75% of total)
- O&M Cost	- 0.45 (15.75% of total)
- Depreciated Assets	- 0.10 (3.5% of total)
Finished Water Quality	0.35
Operational Considerations	0.30
Social / Environmental Issues	0.05
Other Considerations	0.05

The final three alternatives were fed through the software once again to determine the new rankings. The results summarized in the table below are based on capital and O&M costs only; present worth is not included.

Alternative	Revised Relative Ranking
A9 – Ozone/BAF	0.765
A6 – Ozone/BAC/UV	0.747
A1 – Gassy	0.728
A1 – Potentially Gassy	0.748

A sensitivity analysis based on costs revealed A9 to be the highest ranked alternative, which would be the case until the weighting factor for cost is reduced to approximately 20 percent. The sensitivity analysis based on water quality revealed A9 to be the highest ranked alternative until the weighting factor for water quality is raised to a factor of 0.5 and above.

### Present Worth Analysis – Bob Miller

Bob Miller and Amber Halloran worked with Dave Naumann of Black and Veatch in providing the detailed financial analysis. Bob outlined several changes that have occurred since the August 16 meeting including: the RBF capital expense estimate has increased, RBF scenarios for gaseous and potentially gaseous environments have been developed, consulting engineering for all projects has been included at 15 percent of capital cost, and O&M cost has changed slightly.

Furthermore, four new elements have been added to the financial analysis. First, we've added recurring revenue-financed routine capital. We're assuming routine capital investments will need to be made to ensure the full life of the asset beyond the initial investment and O&M costs. Second, replacement capital expenditures have been included. Third, salvage value (residual, un-depreciated book value) has been included. Fourth, inclusion of savings from fewer main break repairs for RBF options. This is because main break data from the last five-year average reveals an average of 45 main breaks per month from March through November. This average increases to 103 main breaks per month from December through February. This is expected to normalize to 60 main breaks per month with RBF because of the finished water temperature. Specifically, circumferential main breaks will be reduced. We are estimating \$2,200 in savings per main break, or an expected savings of \$286,000 per year.

The table below defines the basic assumptions made regarding an initial capital investment for each of the alternatives. Large equipment is considered as 90 percent and small equipment as 10 percent of equipment for each alternative. RBF tunnels and wells have the same depreciable values. Pipes are designed for 100-year life. We can say a limestone tunnel will last longer than a concrete pipe, but we assume a 100-year life for this analysis. The Handy-Whitman Index of Public Utility Construction Costs was used to determine replacement costs.

#### **Initial Capital Investment - \$ millions**

	<b>Pump Station Equip.</b>	<b>Large Equip.</b>	<b>Small Equip.</b>	<b>Buildings / Structures</b>	<b>Piping</b>	<b>RBF Tunnels &amp; Wells</b>	<b>Total Cost</b>
A1 RBF Potentially Gassy	5.32	26.82	2.99	42.23	18.73	136.30	232.39
A1 RBF Gassy	5.27	26.82	2.99	42.12	18.71	165.68	261.59
A6 RI/BAC	8.05	52.80	5.87	50.50	23.10	-	140.32
A9 RI/BAF	8.05	62.40	6.94	58.67	22.68	-	158.74
Depreciable Lives - yrs	25	25	7	40	100	100	
Inflation Factor (HW 5 yr)	3.79%	3.10%	3.10%	4.03%	3.04%	3.04%	

Note: Small Equipment is estimated to be 10% of total equipment (excl pump station)

The table below defines the basic assumptions made regarding recurring operating expenses for each of the alternatives.

#### Recurring Operating Expenses - \$ millions

	Maint.				UV Patent	GAC		
	Materials	Power	Labor	Chemicals	Fee	Replace	Savings	Total
A1 RBF	0.39	2.49	2.34	1.84	n/a	n/a	(0.29)	6.77
A6 RI/BAC	0.59	2.24	2.34	3.01	0.60	0.45	n/a	9.23
A9 RI/BAF	0.43	2.17	2.07	3.01	n/a	n/a	n/a	7.68
Inflation Factors	2.0%	4.0%	3.0%	4.0%	3.0%	3.0%	3.0%	

Note: Savings range for RBF is \$192k min, \$286k avg, \$385k max

The table below provides the project evaluation results. The classic approach was used in this evaluation and includes the initial capital expense and operations expense, offset by RBF benefits and salvage value, combined with a present value (PV) or discount factor of 5 percent. It also includes allowance for routine capital (uses depreciation as proxy) and reinvestment capital. Residual costs are subtracted in this evaluation. The potential benefits of \$286,000 in annual savings from reduced main breaks have also been included. A6 is the lowest priced option, followed by A1 – RBF Potentially Gassy and A9 Ozone; both are practically identical in total cost. A1 – RBF Gassy is the highest priced alternative. Reference the presentation handout for the project evaluation analysis details.

	20-Year Discounted Costs				30-Year Discounted Costs			
	Capital	Operating	Residual	Total	Capital	Operating	Residual	Total
A1 RBF w/\$286k Savings	\$ 237	\$ 171	\$ (60)	\$ 348	\$ 262	\$ 235	\$ (44)	\$ 453
A1 RBF G w/\$286k Savings	\$ 267	\$ 175	\$ (70)	\$ 372	\$ 291	\$ 239	\$ (49)	\$ 482
A6 Ozone & UV	\$ 150	\$ 210	\$ (23)	\$ 337	\$ 197	\$ 290	\$ (35)	\$ 452
A9 Ozone	\$ 170	\$ 204	\$ (25)	\$ 349	\$ 225	\$ 282	\$ (40)	\$ 467

Bob Miller outlined some steps to be taken by Black & Veatch and LWC. Black & Veatch will need to incorporate the retirement of existing facility assets, incorporate incremental O&M expenses and evaluate the effect on the long-range financial plan for each alternative, and provide a written summary of the analysis. LWC will need to develop a qualitative risk assessment of each alternative.

It will take five to seven years to build any given alternative. We must factor in costs to keep our existing facility functional. Overall, the cost comparison between the top two options is very close.

#### Recommendations – Bruce Long

Larry Gaddis reviewed recommendations for the preliminary engineering of A1 and A9. LWC should initiate preliminary engineering for A1 and A9 concurrently, until all of the studies are completed that are necessary to help determine which of the two is more appropriate for LWC. Further, LWC should conduct a full evaluation of CHFP to include: details of incorporating new or modified processes, such as RBF, ozone, BAF, and BAC; the condition of existing structures

and critical infrastructure connections between processes (some will need rehabilitation to keep them viable for the future); the construction sequence and schedule; and validation of cost projections.

Greg Heitzman remarked that RBF is a front-end solution versus an in-plant solution, which poses a greater challenge at ensuring 180 MGD capacity; considering some of the infrastructure is over 100 years old and aging. We are also working to learn the new plant capacities with implementation of the alternatives.

Larry Gaddis then reviewed recommendations specific to the preliminary engineering of A1. Greg Heitzman clarified that these recommendations are based on results from a study conducted by Jordan, Jones, and Goulding. LWC should reactivate the Zorn test well and install new test wells to begin obtaining water quality and quantity data. LWC should conduct modeling to confirm the aquifer yield. A geotechnical analysis and core drilling for natural gas should be conducted. An evaluation of the tunnel alignment options and well connections should be done. LWC should also evaluate integration with the Zorn Pumping Station. Finally, validation of cost projections should be done.

**What kind of test well do you recommend?**

*A pumping well with monitoring wells around it to determine yield, source, quality, and possible contaminants. We would use a phased approach, where we study for a week or so, and then longer if necessary.*

Bruce Long reviewed recommendations specific to the pilot testing of A9. Pilot testing of A9 should analyze ozone demand and decay, bromate formation and control, BAF, and one BAC filter parallel with BAF filter(s) using Ohio River source water. The analysis should verify demand and decay rates to answer questions such as: How much ozone will we require? How quickly does ozone degrade? The pilot testing should be performed throughout all four seasons. LWC will also need to evaluate the integration of new processes into the existing treatment train and stay below the 10 microgram bromate standard. Again, we will need KDOW approval for ozone and BAF.

Greg Heitzman reviewed the preliminary engineering cost estimates. Preliminary engineering for CHFP for A1 and A9 will cost approximately \$350,000. Preliminary engineering specific to A1 will be conducted in two phases; Phase I is estimated to cost \$1.5 million and Phase II is estimated to cost \$3 million. Preliminary engineering specific to A9 for pilot plant testing is estimated to be \$250,000 to \$500,000 for BAF and an estimated \$150,000 for engineering assistance.

**Open Discussion and Questions - All**

**Why has A6 stepped back in the pilot testing from A1 and A9?**

*We understand how UV will work with A6. Ozone is common to both A6 and A9, so we really only need to pilot test one of the two and A9 was selected for this. With A1, we need to determine if the yield is sustainable, water quality, water quantity, and if the tunnels will be determined gaseous or potentially gaseous. We plan to conduct four pump tests to determine water quality and quantity. We plan to have 13 rock cores bored every 2,000 feet, then every 1,000 feet, and then every 500 feet to determine if the tunnels will be gaseous. We could find that*

*one well is gassy, which could make the entire length of the tunnel considered gassy; thus, the phased approach would help prevent us from spending all of the project money up front only to find that A1 isn't feasible.*

Bruce Long stated the ozone pilot plant will require operator intervention to work the instrumentation. We should consider bringing in a third party and a representative from KDOW to help interpret the data. We need to apply an accounting rule that will help reduce the impact on rates in the short term. Bob Miller suggested we make the engineering decision first, and then we can figure out how we account for it.

**What is the suggested time frame for the pilot?**

*Approximately 1-2 years. We would like to pump the Zorn test well for a minimum of 12 months, through all four seasons.*

John Huber suggested the Steering Group proceed with a recommendation to the Board of Water Works to conduct preliminary engineering design and pilot testing on both A1 and A9 approaches, at an estimated \$2.5 million.

**RBF has been used in Germany for some time now. Bruce alluded to uncertainty on yield and quality over extended periods. In your experience, is the water quality and volume consistent over time?**

*Wolfgang Kuehn responded that he would not want to over generalize RBF results. RBF does not work everywhere. We need to consider a combination of river and ground water and the changing seasons. Also, RBF could prove to be a challenge with plugging and pumping of the aquifer.*

**Do you have locks and dams in the Netherlands?**

*Yes, but our wells are downstream from these.*

Jack Wang suggested we modify A1, Phase I to sink larger wells closer to the Zorn Pump Station to collect data on both quality and quantity at higher production rates.

Joe Wise thanked Greg Heitzman and Bruce Long for putting the presentation together. Joe added that he felt much better about making a recommendation to the Board of Water Works.

John Huber commented that the quality of work coming out of this group is top notch. We want to make this as much capital as we can, while staying within the guidelines.

The meeting adjourned.



## LOUISVILLE WATER COMPANY CRESCENT HILL FILTRATION PLANT ADVANCED TREATMENT STUDY Glossary of Terms and Abbreviations

**Adsorption** – A process whereby molecules of a dissolved substance adhere to an adsorbent solid surface. In water treatment, removal of organic compounds by granular or powdered activated carbon.

**Assimilable Organic Carbon (AOC)** – The fraction of organic carbon that can be metabolized by microorganisms. AOC is an indicator of the potential for biological regrowth in the distribution system.

**Biological Filtration** – The process of filtering water through a granular media that has been allowed to develop a microbial film that assists in the removal of AOC.

**Chloramines** – Disinfectants produced by mixing chlorine and ammonia.

**Chlorine** – Chlorine in one of a number of forms is added to water to inactivate disease-causing microorganisms.

**Cryptosporidium (parvum)** – A microorganism found in surface water supplies which is highly resistant to chemical disinfectants.

**CT** – The product of the disinfectant residual concentration (C) in mg/L and contact time (T) in minutes. Used to verify compliance with disinfection requirements.

**Disinfection By-Products (DBPs)** – Chemical compounds formed by the reaction of disinfectants with organic/inorganic substances in water.

**Empty Bed Contact Time (EBCT)** – The volume occupied by granular media divided by the liquid flow rate, expressed in minutes.

**Filter Productivity** – Amount of filtered water produced on a unit area basis, typically expressed in gallons per square foot of filter area per filter run (gal/sq ft). Also referred to as unit filter run volume (UFRV).

**Filtration Rate** – Hydraulic loading rate, typically expressed as gallons per minute per square foot of filter area (gpm/sq ft).

**Flocculation** – Gentle stirring or agitation to accelerate the agglomeration of particles to enhance sedimentation or flotation.

**Flux** – Rate of water passage through an area of membrane, expressed as gallons per square foot per day (gfd).

**Fouling** – Accumulation of contaminants on a membrane surface that increases resistance to water flow and reduces membrane flux.

**Geosmin and MIB** – Taste and odor-causing compounds found in many surface water supplies; produced by cyanobacteria (blue-green algae) or actinomycetes (mold-like filamentous bacteria); can produce earthy/musty odors when present at very low (ng/L) concentrations.

**Giardia (lamblia)** – A protozoan parasite responsible for giardiasis.

**Granular Activated Carbon (GAC)** – Activated carbon with a particle size of 0.5 to 4 mm; typically used as a filtering medium to remove organic contaminants and taste- and odor-causing compounds.

**Haloacetic Acids (HAAs)** – By-products of chlorine disinfection. There are nine known haloacetic acid compounds; five of these compounds (HAA5) are currently regulated.

**Hardness** – The combined concentration of multivalent cations (positively charged particles) in the water; primarily comprised of calcium and magnesium ions.

**Head Loss** – The gradual loss of head (pressure drop) across a filter attributable to the accumulation of removed solids in the filter media.

**IDSE** – Monitoring process that will be used under the impending Stage 2 DBPR to identify locations within the distribution system where high concentrations of disinfection by-products are found, and, ultimately, to select new locations for routine DBP compliance monitoring.

**IESWTR** – Interim Enhanced Surface Water Treatment Rule (effective January 2002).

**Iron and Manganese** – Metallic elements that cause staining/discoloration problems if not removed to low concentrations.

**Log Removal** – Abbreviated term for log10 removal, used to quantify removal of microorganisms such as Giardia, Cryptosporidium, and viruses. A 1-log removal is equivalent to 90 percent reduction in the density of the target organism; a 2-log removal equals a 99 percent reduction; a 3-log removal equals 99.9 percent reduction, etc.

**LRAA** – Locational Running Annual Average (basis for assessing compliance with DBP MCLs under the pending Stage 2 DBPR).

**Long-Term 2 Enhanced Surface Water Treatment Rule (LT2ESWTR)** – Pending regulation that will mandate monitoring of source waters to quantify the concentration of Cryptosporidium in a utility's source water. The concentration determined by this effort will dictate the level of pathogen removal and inactivation a utility will be required to achieve by mid-2011.

**Maximum Contaminant Level (MCL)** – The maximum allowable concentration of a contaminant in drinking water. Primary MCLs are health-related, and compliance is mandatory. Secondary MCLs are related to the aesthetic quality of the water, and compliance with them is recommended but typically not required.

**mg/L** – Milligrams per liter (equal to parts per million (ppm)).

**Microfiltration (MF)** – A process of passing water through membranes with a nominal pore size of 0.1 µm.

**NDMA** – N-Nitrosodimethylamine, a mutagen that has been detected at low concentrations in some waters that have been treated using ion exchange processes and/or that employ chloramines for residual maintenance in the distribution system.

**ng/L** – Nanograms per liter (equal to parts per trillion (ppt)).

**Nitrification** – The formation of nitrate from reduced inorganic nitrogen compounds. For water systems that use chloramines as the disinfectant residual in the distribution system, the undesirable conversion of ammonia to nitrite, which in turn is converted to nitrate by nitrifying bacteria, with subsequent loss of disinfectant residuals in the distribution system.

**NTU** – Nephelometric turbidity unit; common unit of turbidity measurement when using a nephelometric turbidimeter.

**Ozone** – Triatomic oxygen (O<sub>3</sub>) formed by passing oxygen (O<sub>2</sub>) through a high energy electric field. A strong disinfectant.

**pH** – A measure of the acidity or alkalinity of a solution. A pH of 7 is neutral; values lower than 7 represent acidic solutions and values higher than 7, alkaline solutions.

**Powdered Activated Carbon (PAC)** – Activated carbon composed of fine particles (typically 1 – 150 µm) which provide a large surface area for adsorption of impurities from water. PAC is typically added as a slurry either intermittently or continuously to remove taste and odor-causing compounds and/or trace organic contaminants.

**Recovery** – The percentage of membrane feed water that is converted to filtered water (filtrate) by a membrane, taking into account water lost to backwashing, cleaning, and downtime for integrity tests, maintenance washing, etc.

**Regeneration** – Thermal process to restore the adsorptive capacity of GAC.

**SDWA** – Safe Drinking Water Act.

**Stage 2 Disinfection By-Products Rule (Stage 2 DBPR)** – Pending regulation which will mandate compliance with disinfection by-product MCLs at individual distribution system monitoring sites by mid-2011.

**Synthetic Organic Chemicals (SOCs)** – Man-made organic compounds that do not occur naturally in the environment.

**SWTR** – Surface Water Treatment Rule.

**Total Organic Carbon (TOC)** – Sum of all organic carbon compounds in water; typically used as a surrogate parameter to assess the removal of DBP precursor compounds from water supplies.

**Trihalomethanes (THMs)** – Common by-products of chlorine disinfection. Four trihalomethane compounds are currently regulated.

**Turbidity** – The scattering and absorption of light caused by particles suspended in the water. A physical characteristic of water that makes it appear cloudy.

**ug/L** – Micrograms per liter (equal to parts per billion (ppb)).

**Ultrafiltration (UF)** – A process of passing water through membranes with a nominal pore size of around 0.01 µm.

**UV** – Ultraviolet, wavelengths of light used for disinfection.

**Volatile Organic Chemicals (VOCs)** – Lightweight synthetic organic compounds (typically solvents) that vaporize easily and can be readily removed from water by aeration.





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BOARD OF WATER WORKS OF THE  
CITY OF LOUISVILLE, KENTUCKY

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LOUISVILLE WATER COMPANY

WATER SYSTEM  
REVENUE BOND RESOLUTION  
AUTHORIZING THE ISSUANCE OF  
WATER SYSTEM REVENUE BONDS

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Adopted: July 14, 1992

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BOARD OF WATER WORKS OF THE  
CITY OF LOUISVILLE, KENTUCKY

LOUISVILLE WATER COMPANY

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A RESOLUTION OF THE BOARD OF WATER WORKS OF THE CITY OF LOUISVILLE, KENTUCKY, ACTING AS THE GOVERNING BODY OF THE LOUISVILLE WATER COMPANY, AUTHORIZING THE ISSUANCE OF LOUISVILLE WATER COMPANY WATER SYSTEM REVENUE BONDS, SERIES 1992, FOR THE PURPOSES OF (i) REFUNDING THE OUTSTANDING CITY OF LOUISVILLE, KENTUCKY, WATER SYSTEM REVENUE BONDS, SERIES 1986A, DATED JULY 15, 1986 AND PAYING CERTAIN INTEREST ON THE OUTSTANDING CITY OF LOUISVILLE, KENTUCKY, WATER SYSTEM REVENUE BONDS, SERIES 1986B, DATED FEBRUARY 1, 1987 (ii) PROVIDING FUNDING FOR CONSTRUCTION AND ACQUISITION OF EXTENSIONS, IMPROVEMENTS AND BETTERMENTS TO THE WATERWORKS SYSTEM AND DISCHARGING INTERIM FINANCING OBLIGATIONS INCURRED IN CONNECTION THEREWITH AND (iii) MAKING PROVISION FOR CAPITALIZATION OF INTEREST ON AND PAYMENT OF DISCOUNT AND COSTS OF ISSUANCE OF SUCH WATER SYSTEM REVENUE BONDS, SERIES 1992; PROVIDING FOR THE ISSUANCE FROM TIME TO TIME OF ADDITIONAL SERIES OF WATER SYSTEM REVENUE BONDS AS NECESSARY TO FINANCE THE ACQUISITION AND CONSTRUCTION OF ADDITIONAL IMPROVEMENTS TO THE WATERWORKS SYSTEM AND FOR REFUNDING OF OUTSTANDING OBLIGATIONS; PROVIDING FOR THE FIXING AND COLLECTING OF WATER RATES AND CHARGES; PROVIDING FOR THE APPOINTMENT OF A TRUSTEE AND DEPOSITARIES; AND SETTING FORTH THE RIGHTS AND REMEDIES OF THE HOLDERS OF THE BONDS.

WHEREAS, the City of Louisville, Kentucky (the "City"), a city of the first class in the Commonwealth of Kentucky is the owner of all of the capital stock of the Louisville Water Company, a corporation organized and existing under the laws of the Commonwealth, and said capital stock is now a part of the resources of the Sinking Fund of the City under the control and management of the Commissioners of the Sinking Fund of the City (the "Commissioners"); and

WHEREAS, the waterworks system of the Louisville Water Company serves the City and its environs (the "Waterworks System"), and consists of administrative offices, pumping plants, water softening and treatment plants, reservoirs, mains, service connections, machinery, equipment and other property appurtenant thereto, all of which is supplying and distributing water to users within the City and its environs; and

WHEREAS, pursuant to Section 96.230, et seq. of the Kentucky Revised Statutes ("KRS"), the control, management and operations of the Waterworks System is carried out by and through the Board of Water Works of the City (the "Board") a public body corporate and a political subdivision of the Commonwealth of Kentucky, created and existing under and pursuant to the provisions of Sections 96.230 to 96.315, inclusive, of the Kentucky Revised Statutes, the Board being the governing body of, and being vested,

pursuant to KRS 96.260, with all the authority and privileges, exercising all the franchises, and having possession, control and management of all the property of said Louisville Water Company; and pursuant to Section 96.300 of the Kentucky Revised Statutes, the Board has and possesses the specific power and authority to authorize the issuance of the bonds of the Louisville Water Company to provide funding for the requirements of the Louisville Water Company and the Waterworks System and for the refunding of outstanding bonds payable from the Revenues of the Waterworks System; and

WHEREAS, the Louisville Water Company (i) is a corporation all of the capital stock of which is owned by the City, a de jure political subdivision of the Commonwealth, as provided by KRS 96.230, (ii) is controlled, managed and operated by the Board, a de jure political subdivision of the Commonwealth, (iii) performs essential governmental purposes and services by providing public, municipal water services to the general public and (iv) possesses the power of eminent domain and limited police power; and

WHEREAS, the Board has determined that it is necessary to acquire and construct major improvements and betterments to the Waterworks System at this time and to finance such improvements and betterments by the issuance of bonds of the Louisville Water Company pursuant to Sections 96.230 to 96.315, inclusive and Sections 58.010 to 58.180, inclusive, of the Kentucky Revised Statutes (collectively, the "Act"); and

WHEREAS, the Board has also determined that (i) the refunding of the outstanding 1986 Series A Bonds of the City by the application of certain of the proceeds of the Series 1992 Bonds herein authorized to be issued and other available moneys and (ii) the simultaneous refunding of the outstanding 1986 Series B Bonds of the City by the application of available moneys of the Louisville Water Company not derived from bond proceeds or interest on bond proceeds and by certain proceeds of such Series 1992 Bonds should be carried out in the public interests; and

WHEREAS, the Board is specifically authorized by Section 96.300 of the Act to authorize the issuance of the revenue bonds of the Louisville Water Company for the purposes referred to above;

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD OF WATERWORKS OF THE CITY OF LOUISVILLE, KENTUCKY, AS FOLLOWS:

## ARTICLE I

### DEFINITIONS, STATUTORY AUTHORITY, AND CERTAIN DETERMINATIONS

Section 101. Definitions. The following terms shall, for all purposes of this Resolution have the following meanings:

"Accreted Value" shall mean with respect to any Discount Bond, the initial reoffering price or initial principal amount at which such Discount Bond is offered for sale to the public or sold to the initial purchaser thereof at the time of sale thereof, without reduction to reflect underwriter's discount or placement agent's fees, compounded from the date of delivery of such Discount Bond semiannually on each interest payment date prior to the date of calculation (and including such date of calculation if such date of calculation shall be an interest payment date) at the original issue yield to maturity, less, with respect to any Discount Bond with interest payable on a current basis, any interest paid and payable during such period, plus, if such date of calculation shall not be an interest payment date, a portion of the difference between the Accreted Value as of the immediately preceding interest payment date and the Accreted Value as of the immediately succeeding interest payment date calculated based upon an assumption that Accreted Value accrues during any semiannual period in equal daily amounts, provided, however, that the calculation of Accreted Value for purposes of actions, requests, notifications, consents or direction of Bondholders under Articles VII, VIII, IX or X or Section 1102 of this Resolution shall be based upon the Accreted Value calculated as of the interest payment date immediately preceding such date of calculation (unless such date of calculation shall be an interest payment date, in which case calculated as of the date of calculation).

"Act" shall mean, collectively, Sections 96.230 to 96.315, inclusive and Sections 58.010 to 58.180, inclusive, of the Kentucky Revised Statutes, as the same may be from time to time amended.

"Aggregate Bond Service" for any period shall mean, as of any date of calculation and with respect to all Bonds and Bond Anticipation Notes, the sum of the amounts of Bond Service for such period.

"Annual Budget" shall mean the budget adopted or in effect for each Fiscal Year as the same may be revised from time to time as provided in Section 507 of this Resolution.

"Authorized Officer" shall mean the President, any Vice President, the Treasurer and the Secretary of each of the Issuer and the Company and any other person authorized by the Issuer or the Company to perform the act or sign the document in question.

"Beneficial Owner" shall mean the person in whose name a Bond is recorded as the beneficial owner thereof by the respective systems of DTC and each of the DTC Participants, or the Registered Owner of such Bond if such Bond is not then registered in the name of CEDE & Co.



"Board" shall mean the Board of Water Works of the City of Louisville, Kentucky, a political subdivision of the Commonwealth of Kentucky duly empowered to issue the Bonds, notes, Bond Anticipation Notes and other obligations of the Company, appointed, qualified and acting under the provisions of Sections 96.230 to 96.315, inclusive of the Kentucky Revised Statutes and having all of the powers and authority specifically enumerated by KRS 96.260, or such board, commission or agency as may by subsequent amendment of such sections of the Kentucky Revised Statutes or pursuant thereto hereafter succeeds to the duties and responsibilities of said Board of Water Works.

"Bond" or "Bonds" shall mean any bonds authenticated and delivered pursuant to this Resolution.

"Bond Anticipation Notes" or "Notes" shall mean notes of the Issuer authorized in Section 209.

"Bond Fiscal Year" shall mean the period of twelve (12) consecutive months beginning on the fifteenth day of November in any calendar year and ending on the fourteenth day of November in the next succeeding calendar year.

"Bond Fund" shall mean the fund of that name referred to in Section 502.

"1984 Bond Ordinance" shall mean Ordinance No. 206, Series 1984, enacted August 14, 1984 by the Board of Aldermen of the City as amended by Ordinance No. 241, Series 1984, enacted September 11, 1984 by the Board of Aldermen of the City.

"1986A Bond Ordinance" shall mean Ordinance No. 228, Series 1986, adopted July 8, 1986 by the Board of Aldermen of the City.

"1986A Bonds" shall mean the outstanding "City of Louisville Water System Revenue Bonds, 1986 Series A," dated July 15, 1986, issued and outstanding under the 1986A Bond Ordinance.

"1986B Bond Ordinance" shall mean Ordinance No. 14, Series 1987, adopted February 10, 1987, by the Board of Aldermen of the City.

"1986B Bonds" shall mean the outstanding "City of Louisville Water System Revenue Bonds, 1986 Series B," dated February 1, 1987, issued and outstanding under the 1986B Bond Ordinance.

"Bond Registrar" shall mean the Trustee.

"Bond Reserve Requirement" shall mean an amount equal to 50% of the maximum Aggregate Bond Service in the current or any future Bond Fiscal Year, excluding the Series 2 Note authorized by Section 206 from such calculation. The Bond Reserve Requirement in respect of the Series 2 Note shall be as provided by Section 206.

"Bond Resolution" shall mean this Resolution, in respect of the Series 1992 Bonds and in the case of any other Series of Bonds shall mean a resolution adopted by the Board under authority of this Resolution authorizing a Series of Bonds.

"Bond Service" for any period shall mean, as of any date of calculation and with respect to any Series, an amount equal to the sum of (i) interest accrued during such period on Bonds of such Series or Bond Anticipation Notes issued in anticipation of the Bonds of such Series and (ii) that portion of each Principal Installment for such Series which would accrue during such period if such Principal Installment were deemed to accrue daily in equal amounts from the next preceding Principal Installment due date for such Series (or, if there shall be no such preceding Principal Installment due date, from a date one year preceding the due date of such Principal Installment). Such interest and Principal Installments for such Series shall be calculated on the assumption that no Bonds of such Series Outstanding at the date of calculation will cease to be Outstanding except by reason of the payment of each Principal Installment on the due date thereof, and such interest on such Notes shall be calculated on the assumption that all such Notes shall be retired upon the maturity date or dates thereof. The calculation of interest on Bonds bearing a variable rate of interest shall be made on the assumption that the rate of interest applicable for such period will be the same as the average annual rate of interest on such Bonds for the 12-month period immediately preceding the date of calculation or, if such Bonds were not Outstanding during such entire 12-month period, the average interest rate for the portion of such period during which such Bonds were Outstanding, or if such Bonds were not Outstanding during any part of such 12-month period, at a fixed rate equal to the maximum rate permissible for such Bonds.

"Bond Service Account" shall mean the account of that name referred to in Section 502.

"Bond Year" means, with respect of any Series of Bonds, during the period while such Series of Bonds remain outstanding, the annual period provided for the computation of Excess Earnings under Section 148(f)(2) of the Code and Treasury Regulation 1.148-8T(b)(2) promulgated thereunder.

"Book-Entry System" shall mean the system in which a Series of Bonds are delivered into the possession of DTC and are issued and fully registered as to principal and interest in the name of CEDE & Co. and whereby beneficial interests in such Series of Bonds are purchased by investors through DTC Participants, such interests shown and transfers thereof effected only through the records maintained by the respective DTC Participants from whom each Beneficial Owner acquired its interest.

"Capital Expenditures" shall mean all expenditures made for additions and improvements to and renewals and replacements of the

Waterworks System (other than ordinary maintenance and repairs) acquired, constructed or installed for the purpose of preserving, extending, increasing or improving the service rendered by, or for reducing the cost of operation of, such System and shall include the cost of purchasing and installing such equipment and appurtenances as may be necessary to meet the demands upon such system; and such term shall also include the cost of acquisition of such lands, easements and rights-of-way and such engineering, financial and legal expenses as may be required in connection with the foregoing.

"CEDE & Co." shall mean CEDE & Co., as nominee of DTC, and any successor nominee of DTC substituted in accordance with Section 207 hereof.

"Certificate" shall mean a written statement delivered by any party affirming the truth and accuracy of statements of fact set forth therein.

"City" shall mean the City of Louisville, Kentucky.

"Code" means the United States Internal Revenue Code of 1986, as amended. Each reference to a Section of the Code herein shall be deemed to include the United States Treasury regulations, including temporary and proposed regulations, relating to such Section which are applicable to a Series of Bonds or the use of the proceeds thereof.

"Commonwealth" shall mean the Commonwealth of Kentucky.

"Company" means the Louisville Water Company, a corporation all of the capital stock of which is owned by the City, and being a corporation described in KRS 96.230.

"Computation Period" means the period of time over which Excess Earnings with respect to a Series of Bonds are required to be computed under Section 148(f) of the Code.

"Commissioners" shall mean the Commissioners of the Sinking Fund of the City or any successors thereto.

"Construction and Acquisition Fund" shall mean the fund of that name referred to in Section 502.

"Consulting Engineers" shall mean CH2M Hill, or any other engineering firm or corporation having a nationwide and favorable reputation, as determined by the Board, for skill and experience, employed by the Issuer and satisfactory to the Trustee.

"Cost of Construction" shall mean with respect to a Project or Projects, without limiting or restricting the definition of cost as permitted under the Act or other provisions of this Resolution:

(a) obligations incurred for labor and materials and to contractors, builders and materialmen in connection with the construction, acquisition and installation of a Project, for machinery and equipment, and for the restoration of property damaged or destroyed in connection with such construction;

(b) the cost of any indemnity and surety bonds to secure deposits in the Construction and Acquisition Fund, the fees and expenses of the Trustee during construction, taxes or other municipal or governmental charges lawfully levied or assessed during construction upon a Project or any property acquired therefor, and premiums on insurance (if any) in connection with a Project during construction;

(c) fees and expenses of engineers, including the Consulting Engineers, for studies, surveys and estimates, engineering, and the preparation of plans and supervising construction, as well as for the performance of all other duties of engineers set forth herein in relation to the construction of a Project or the issuance of Bonds therefor;

(d) expenses of administration properly chargeable to a Project, legal expenses and fees, financing charges, costs of audits and all financing costs related to issuing the Bonds or Bond Anticipation Notes, and all other items of expense not elsewhere in this definition specified, incident to the construction and equipment of a Project and the placing of the same in operation and to the acquisition of real estate, franchises and rights-of-way therefor, or any interest therein, including abstracts of title and title insurance and interest on the Bonds until the Date of Completion of a Project;

(e) the cost of acquiring by purchase, if such purchase shall be deemed expedient by the Issuer, and the amount of any award or final judgment in any proceedings to acquire by condemnation, such property, lands, property rights, rights-of-way, franchises, leaseholds, easements, and other interests in land as may be deemed necessary or convenient for the acquisition or construction of a Project, or the operation thereof, options and partial payments thereon, and the amount of any damages incident to or consequent upon the acquisition or construction of a Project; and

(f) any obligation or expense heretofore or hereafter incurred by the Company and any amounts heretofore or hereafter advanced by the Company for any of the foregoing purposes.

"Counsel's Opinion" shall mean an opinion signed by an attorney or firm of attorneys of nationally recognized standing in the field of law relating to municipal bonds selected by the Issuer.

"Cumulative Excess Earnings" means the amount of all Excess Earnings earned from the date of the original delivery of a Series of Bonds through the end of the relevant Computation Period, less the amount of any Excess Earnings previously paid to the United States pursuant to Section 512 hereof.

"Current Expenses" shall mean the Company's reasonable and necessary current expenses of maintenance, repair and operation of the Company, and shall include, without limiting the generality of the foregoing, all ordinary and usual expenses of maintenance, repair and operation, which may include expenses not annually recurring, all administrative and engineering expenses, any reasonable payments to pension or retirement funds properly chargeable to the Company, insurance premiums, fees and expenses of the Trustee and of the Paying Agents, legal expenses, interest on any indebtedness issued for the Company with a lien subordinate to the lien on the Bonds, and any other expenses required to be paid by the Company under the provisions of this Resolution or by law, but shall not include any reserves for extraordinary maintenance or repair, or any allowance for depreciation, or any deposits or transfers to the credit of the Bond Fund or the Depreciation Fund.

"Date of Completion" with respect to a Project, shall mean the date upon which the Project has been acquired or constructed and is capable of performing its function as evidenced by a Certificate of the Chief Engineer of the Board filed with the Trustee and the Board.

"Depository" shall mean any bank or trust company selected by the Board as a depository of Company moneys to be held under the provisions of this Resolution, which may include the Trustee.

"Depreciation Fund" shall mean the fund of that name referred to in Section 502.

"Discount Bond" shall mean (i) any Bond offered for sale to the public or sold to the initial purchaser thereof at the time of sale thereof by the Issuer at an initial reoffering price or initial principal amount of less than ninety-seven per centum (97%) of the principal amount due at maturity thereof, without reduction to reflect underwriter's discount or placement agent's fees, and (ii) any other Bond designated as a Discount Bond by the Bond Resolution or the Sale Resolution authorizing such Series of Bonds.

"DTC" shall mean The Depository Trust Company, a limited purpose trust company organized under the laws of the State of New York, and its successors and assigns (which in each case shall be a

qualified and registered "clearing agency" under Section 17A of the Securities Exchange Act of 1934, as amended).

"DTC Participants" shall mean trust companies, banks, brokers, dealers, clearing corporations, and certain other organizations that are participants of DTC.

"Engineer's Certificate" shall mean a Certificate of the Consulting Engineers.

"Escrow Agent" shall mean First National Bank of Louisville, Louisville, Kentucky, or any successor in trust under the Escrow Agreement.

"Escrow Agreement" shall mean the agreement, dated as of August 1, 1992, authorized by Section 205, between the Company and the Escrow Agent, relating to the receipt and holding in trust by the Escrow Agent of amounts to be used to pay principal of and interest on the 1986A Bonds and the 1986B Bonds.

"Escrow Fund" shall mean the fund established by the Escrow Agreement and held by the Escrow Agent for the payment of the 1986A Bonds and the 1986B Bonds.

"Event of Default" shall mean any event specified in Section 1001.

"Excess Earnings" shall mean, with respect to a Series of Bonds, an amount equal to the sum of (i) plus (ii) where:

(i) is the excess of

(a) the aggregate amount earned on all nonpurpose investments in which gross proceeds of the relevant Series of Bonds are invested (other than investments attributable to an excess described in this clause (i)), over

(b) the amount which would have been earned if such nonpurpose investments (other than amounts attributable to an excess described in this clause (i)) were invested at a rate equal to the yield on the relevant Series of Bonds; and

(ii) any income attributable to the excess described in clause (i).

The sum of (i) plus (ii) shall be determined in accordance with Sections 148(f)(2) and 148(f)(4) of the Code and in accordance with the provisions of Treasury Regulations Sec. 1.148-OT through 9T (or any additional or successor provisions thereof). As used herein, the terms "gross proceeds," "nonpurpose investment" and "yield" have the meanings assigned to them for purposes of Section 148(f)(6) of the Code and applicable federal income tax regulations.

"Fiduciary" or "Fiduciaries" shall mean the Trustee, any Paying Agent, any escrow agent appointed in connection with the refunding of Bonds, any Depositary, or any or all of them, as may be appropriate.

"Fiscal Year" shall mean that period of twelve consecutive calendar months which shall be determined and ordered by the Board from time to time to constitute the Fiscal Year of the Company and the Board.

"Funds" or "Accounts" shall mean one or more of the funds or accounts referred to in Article V.

"Government Obligations" shall mean direct obligations of, or obligations guaranteed by, the United States of America and, to the extent permitted by law, any certificate or other evidence of an ownership interest in any such securities or in specified portions thereof consisting of the principal thereof or the interest thereon or any combination thereof.

"Holder" or "Bondholder", or any similar terms, shall mean any person who shall be the registered owner of any Bond or Bonds.

"Investment Securities" shall mean (i) Government Obligations and to the extent permitted by law, obligations the principal of and interest on which are fully secured thereby; (ii) to the extent permitted by law, obligations issued by any of the following agencies: Export-Import Bank, Government National Mortgage Association, Farmers Home Administration, the Federal National Mortgage Association to the extent that such obligations are guaranteed by the Government National Mortgage Association, any federal agency to the extent that such obligations are backed by the full faith and credit of the United States and interest on obligations issued by the Resolution Trust Funding Corporation; (iii) to the extent permitted by law, public housing bonds issued by public housing authorities and fully secured as to the payment of both principal and interest by a pledge of annual contributions under an annual contributions contract or contracts with the United States of America, or project notes issued by public housing authorities, or project notes issued by local public agencies, in each case, fully secured as to the payment of both principal and interest by a requisition or payment agreement with the United States of America; (iv) to the extent permitted by law, deposits in interest-bearing time deposits or certificates of deposit or similar arrangements issued or provided by any bank, trust company or national banking association, including the Trustee, which is a member of the Federal Reserve System and has a capital stock and surplus of at least \$25,000,000; (v) to the extent permitted by law, fixed income securities (including securities with variable rates of interest or no interest) of any corporation organized and existing under the laws of any state of the United States of America or the District of Columbia which are rated not less than AAA or Aaa or their equivalents by Standard & Poor's Corporation and Moody's

Investors Service, Inc., respectively, or their successors; (vi) to the extent permitted by law, commercial paper or finance company paper of an issuer which is rated not less than A-1 or prime-one or the rating equivalent as the highest rating category by Standard & Poor's Corporation and Moody's Investors Service, Inc.; (vii) to the extent permitted by law, direct obligations of the World Bank; and (viii) to the extent permitted by law, repurchase agreements with any bank, trust company or national banking association described in clause (iv) hereof the long-term debt of which is rated by Standard & Poor's Corporation and Moody's Investors Service, Inc. at ratings of at least ~~Baa3~~ ~~A3~~ and Baa3/P-3, respectively, including the Trustee; provided, however, that any such repurchase agreement shall include the following terms: (a) any purchases or sales made thereunder shall include only investments that are direct obligations of, or obligations guaranteed by, the United States of America; (b) at all times subsequent to the Trustee's initial entry into any such agreement and prior to the repurchase by and delivery of such securities to a banking entity described above, possession and title to such securities shall vest in the Trustee; (c) in the event that the banking entity chooses to deliver certificates representing securities purchased under the agreement, rather than to effect delivery and the transfer of title through the "Book Entry System" at one of the Federal Reserve Banks, then such certificates shall be in bearer form; (d) in the event that certificates representing the securities purchased under the agreement are to be delivered, the Trustee or its paying agent shall release payment for the securities only upon receipt of delivery of the certificates; and (e) all payments of any interest becoming due on securities purchased under the agreement during the term of the agreement shall be made directly to the entity who holds title to the securities at the time such interest becomes due.

"Issuer" shall mean the Board.

"KRS" shall mean the Kentucky Revised Statutes.

"Legal Counsel" shall mean any attorney or firm of attorneys retained by the Board.

"Letter of Representations" shall mean the letter from Trustee and the Issuer to DTC, substantially in the form of Exhibit B, attached to this Resolution, including any supplements, modifications or amendments thereto as shall be agreed upon from time to time by the Trustee, the Issuer and DTC.

"Net Revenues" shall mean for any particular period the amount of the excess of Revenues over Current Expenses plus depreciation for such period.

"Operation Fund" shall mean the fund of that name referred to in Section 502.

"Outstanding", when used with reference to a Bond or Bonds of a Series, shall mean, as of any date, a Bond or Bonds of such



Series theretofore or thereupon being authenticated and delivered under the Resolution except:

(i) any Bonds cancelled by the Trustee at or prior to such date,

(ii) Bonds for the payment or redemption of which moneys equal to the principal amount or Redemption Price thereof, as the case may be, with interest to the date of maturity or redemption date, shall be held by one or more Fiduciaries in trust for such purpose (whether at or prior to the maturity or redemption date), provided that if such Bonds are to be redeemed, notice of such redemption shall have been given as in Article IV provided or irrevocable instructions and provisions satisfactory to the Trustee shall have been made for the giving of such notice,

(iii) Bonds in lieu of or in substitution for which other Bonds shall have been authenticated and delivered, and

(iv) Bonds deemed to have been paid as provided in subsection 2 of Section 1101.

"Paying Agent" shall mean the Trustee, in the case of the Series 1992 Bonds and any paying agent for the Bonds of any Series, and its successor or successors and any other corporation which may at any time be substituted in its place pursuant to this Resolution.

"Principal" or "principal" shall mean (a) as such term references the principal amount of a Discount Bond, the Accreted Value thereof, and (b) as such term references the principal amount of any other Bond, the principal amount at maturity of such Bond.

"Principal Installment" shall mean, as of the date of calculation and with respect to any Series, so long as any Bonds thereof are Outstanding, the sum of (i) the principal amount of Serial Bonds Outstanding of such Series due on a certain future date and the principal amount of Term Bonds due on a certain future date payable by reason only of the maturity of such Term Bonds, and (ii) the Sinking Fund Installment due on a certain future date for Term Bonds Outstanding of such Series, in each case in the amounts and on the dates as provided in the Bond Resolution or the Sale Resolution authorizing such Series regardless of any retirements of Bonds.

"Prior Lien Bonds" shall mean any bonds issued and outstanding under the Prior Lien Bond Ordinances.

"Prior Lien Bond Ordinances" shall mean the following ordinances adopted by the Board of Aldermen of the City: Ordinance No. 170, Series 1954, as amended by Ordinance No. 135, Series 1955, Ordinance No. 108, Series 1965, Ordinance No. 227, Series 1969, and Ordinance No. 5, Series 1974.

"Project" shall mean any project directly or indirectly related to the supply and distribution of water by the Waterworks System and which is permitted under the provisions of the Act.

"1992 Project" shall mean the following:

- (a) Such pumping stations, pumps, telemetering and communications facilities as necessary to provide for remote, automatic and supervisory control of facilities to support those areas of the Waterworks System existing at an elevation higher than that which can be served from the System's plant high lift pumping facilities;
- (b) Storage facilities to provide water storage adequate to better support maximum hour demands in the Waterworks System.
- (c) Transmission mains to strengthen the existing distribution system and to carry maximum days' system demands throughout the Waterworks System including but not limited to those mains identified in the Implementation Plan for the Extension of Water Service in Jefferson County, dated January, 1992.
- (d) Distribution main improvements and connections to correct problems within the existing System, such as inadequate fire flows, red water occurrences, inadequate circulation and excessive main break frequency.
- (e) Water quality laboratory additions and improvements to support requirements under the Safe Drinking Water Act, and construction of facilities supporting newly defined water quality needs;
- (f) Additional machinery, equipment, facilities renewals, relocations, additions, extensions and betterments of and to the Waterworks System to increase the general capacity of the System or to place and maintain the System in proper condition for safe, efficient and economic operation or to preserve, expand, increase or improve the services rendered by the System or to meet requirements for services in areas to which no service is being rendered at the time for the adoption of the Resolution.
- (g) Data Processing and other administrative systems and facilities to increase productivity and improve customer service.

The 1992 Project is more completely described in Appendix D to the 1992 Annual Budget of the Company, approved by the Board on November 12, 1991.

"Qualified 1992 Project Costs" shall have the meaning ascribed to such term by Section 104 of this Resolution.

"Rebate Fund" means the fund created by Section 512 of this Resolution.

"Redemption Price" shall mean, with respect to any Bond, the principal amount thereof plus the applicable premium, if any, payable upon redemption thereof pursuant to the Resolution.

"Refunding Bonds" shall mean all Bonds, whether issued in one or more Series or as part of a Series, authenticated and delivered on original issuance pursuant to Section 204 or Section 205.

"Registered Owner" means the person or persons in whose name or names a Series 1992 Bond shall be registered on books of the Issuer kept for that purpose by the Trustee, as Bond Registrar, in accordance with the terms of this Resolution.

"Reserve Account" shall mean the account of that name referred to in Section 502.

"Resolution" or "General Bond Resolution" shall mean this Resolution as from time to time amended or supplemented.

"Revenue Fund" shall mean the fund of that name referred to in Section 502.

"Revenues" shall mean all revenues, rates, fees, charges, rents and other income and receipts, as derived by or for the account of the Company, including income in any Fund or Account, determined in accordance with generally accepted accounting principles, but Revenues shall not include customer deposits, proceeds from the sale of property, grants and contributions in aid of construction, including, but not limited to, System Development Charges, assessment levies and other similar capital investment recovery fees and charges.

"Sale Resolution" shall mean a resolution of the Board authorizing the sale of a Series of Bonds.

"Serial Bonds" shall mean the Bonds of a Series other than Term Bonds.

"Series" shall mean all of the Bonds authenticated and delivered on original issuance in a simultaneous transaction pursuant to a Bond Resolution, and any Bonds thereafter authenticated and delivered in lieu of or in substitution therefor pursuant to this Resolution regardless of variations in maturity, interest rate, or other provisions.

"Series 1992 Bonds" shall mean \$74,835,000 principal amount of "Board of Water Works of the City of Louisville, Kentucky, Louisville Water Company Water System Revenue Bonds - Series 1992," dated August 1, 1992.

"Series 1 Note" shall mean collectively, the promissory note or notes of the Company executed and delivered by the Company to provide interim financing for payment of Cost of Construction of the 1992 Project.

"Series 2 Note" shall mean the 1992 Series 2 Note of the Company, dated the date of issuance of the Series 1992 Bonds, which is authorized by Section 206 of this Resolution.

"Sinking Fund Installment" shall mean an amount so designated which is established pursuant to Section 202 or Section 205.

"State" or "Commonwealth" shall mean the Commonwealth of Kentucky.

"Supplemental Resolution" shall mean any resolution supplemental to or amendatory of this Resolution, adopted by the Board in accordance with Article VIII.

"Term Bonds" shall mean the Bonds of a Series which shall be stated to mature on one date and which shall be subject to retirement by operation of Sinking Fund Installments.

"Trustee" shall mean the trustee appointed by the Board, and its successor or successors and any other corporation which may at any time be substituted in its place pursuant to this Resolution.

"Waterworks System" or "System" shall mean the waterworks system of the Company, consisting of administrative offices, pumping plants, water softening and treatment plants, reservoirs, mains, service connections, machinery, equipment and other property appurtenant thereto, including all Projects, which at any time is supplying and distributing water to users within and without the City and its environs.

Except where the context otherwise requires, words importing the singular number shall include the plural number and vice versa, and words importing persons shall include firms, associations and corporations, and words of the masculine gender shall be deemed and construed to include correlative words of the feminine and neuter genders.

The terms "hereby", "hereof", "hereto", "hereunder", and any similar terms, as used in this Resolution, refer to this Resolution.

Section 102. Authority for this Resolution. This Resolution is adopted pursuant to the provisions and authority of the Act.

Section 103. Resolution to Constitute a Contract. In consideration of the purchase and acceptance of any and all of the Bonds authorized to be issued under this Resolution by those who shall hold the same from time to time, this Resolution shall be deemed to be and shall constitute a contract between the Issuer and the Company on the one hand and the Holders from time to time of the Bonds on the other hand; and the pledges made in this Resolution and the covenants and agreements herein set forth to be performed by or on behalf of the Issuer and the Company shall be for the equal benefit, protection and security of the Holders of any and all of the Bonds, all of which, regardless of the time or times of their issue or maturity or the payment of interest thereon, shall be of equal rank on a parity basis without preference, priority or distinction of any of the Bonds over any other thereof except as expressly provided in or permitted by this Resolution.

Section 104. Certain Determinations of the Issuer. 1. The Waterworks System and all additions, modifications, extensions and increments thereto, is hereby declared to be a public project within the meaning of Section 58.010 of the Act.

2. It is hereby determined that the Series 1992 Bonds shall be issued pursuant to the provisions of Section 205 hereof for the purposes of (i) providing for the redemption, payment and discharge of the 1986A Bonds within 90 days following the date of issuance of the Series 1992 Bonds in accordance with the provisions of the 1984 Bond Ordinance and the 1986A Bond Ordinance (it being a condition precedent to the issuance of the Series 1992 Bonds that the Series 1986B Bonds shall be simultaneously defeased and discharged by application of other available moneys of the Issuer), (ii) providing for the payment of interest on the 1986B Bonds coming due on November 15, 1992, (iii) providing financing for the Cost of Construction of the 1992 Project, (iv) providing for the payment and discharge of interim financing obligations incurred by the Issuer for payment of Cost of Construction of the 1992 Project and represented by the Series 1 Note, (v) providing for the capitalization of interest on the Series 1992 Bonds and (vi) making provisions for discount and costs of issuance of the Series 1992 Bonds. The expenditures enumerated in clauses (i) through (vi) of this Section 104.2 are hereinafter sometimes referred to as "Qualified 1992 Project Costs."

3. It is hereby determined that the aforesaid refundings of the 1986A Bonds and the 1986B Bonds are necessary or desirable in the public interest.

4. Provisions shall be made for the redemption, payment and discharge of the 1986A Bonds and the 1986B Bonds in accordance with the applicable provisions of the 1986A Bond Ordinance and the 1986B Bond Ordinance. Upon such provisions having been made as of

the date of issuance of the Series 1992 Bonds, and upon the issuance of Certificates evidencing defeasance of the 1986A Bonds and the 1986B Bonds by the Trustee, it shall be recognized and acknowledged that as of the date of issuance of the Series 1992 Bonds under Section 205 hereof, the City, the Issuer and the Company will have no further obligation with respect to the 1986A Bonds and 1986B Bonds.

## ARTICLE II

### AUTHORIZATION AND ISSUANCE OF BONDS AND BOND ANTICIPATION NOTES

Section 201. Authorization of Bonds. 1. This Resolution creates an issue of Bonds to be designated as "Water System Revenue Bonds" and creates a continuing lien as hereinafter provided in Section 501 to secure the full and final payment of the principal or Redemption Price of and interest on all the Bonds. The Bonds issued hereunder from time to time shall be special obligations of the Issuer payable solely from Revenues as described herein. The aggregate principal amount of Bonds which may be executed, authenticated and delivered under this Resolution is not limited except as provided in this Resolution or as otherwise limited by law.

2. The Bonds may, if and when authorized by the Issuer pursuant to one or more Bond Resolutions, be issued in one or more Series. In addition to the name "Water System Revenue Bonds", the Bonds shall include such further appropriate particular designations added to or incorporated in such title for the Bonds of any particular Series, as the Issuer may determine. All Bonds issued hereunder shall rank on a basis of parity and equality with all Bonds Outstanding, as provided in Section 501 hereof.

### Section 202. General Provisions for Issuance of Bonds.

1. Bonds of any Series shall be authorized by a Bond Resolution which shall specify:

(1) The Project or Projects, if any, being undertaken by the Issuer;

(2) The authorized principal amount, designation and Series of such Bonds;

(3) The purposes for which such Series of Bonds are being issued, which shall be (i) one or more of the purposes set forth in Sections 203 and 204 or (ii) the redemption or payment of Bonds of such Series of Bonds, specifying the Bonds to be redeemed or paid;

(4) The date or dates of the Series of Bonds and the date or dates of the payment of the Principal Installments of

the Bonds of such Series, provided that each such payment date shall fall upon an interest payment date for such Bonds;

(5) If so determined by the Issuer, restrictions or limitations on the terms and issuance of Refunding Bonds, in addition to the restrictions and limitations contained in the Resolution;

(6) If so determined by the Issuer, the Redemption Price or Prices, if any, and, subject to Article IV, the redemption terms, if any, for the Bonds of such Series; and

(7) The terms upon which the Issuer will sell the Bonds.

2. The Issuer shall, in connection with the sale of the Bonds of each Series, adopt a Sale Resolution prior to authentication and delivery of the Bonds which shall specify:

(1) The interest rate or rates, if any, of the Bonds of such Series, or the manner of determining the same, and the interest payment dates therefor, if any;

(2) The principal amount of the Series of such Bonds, if such amount differs from the authorized principal amount of such Series as set forth in the Bond Resolution adopted by the Board pursuant to subsection 1 of this Section;

(3) If not provided for in the Bond Resolution, any or all of (i) the Redemption Price or Prices, if any, and, subject to Article IV, the redemption terms, if any, for the Bonds of such Series and the maturity date or dates of the Bonds of such Series, and the principal amounts of the Bonds payable on such dates; (ii) the Paying Agent or Paying Agents, if any, and the place or places of payment of the principal and Redemption Price, if any, of and interest on, the Bonds of such Series; (iii) the amount, if any, to be deposited in the Reserve Account, from the proceeds of such Bonds or otherwise, or the manner of determining the same; (iv) if so determined by the Board, the denominations of, and the manner of numbering and lettering the Bonds of such Series; (v) the amount and due date of each Sinking Fund Installment, if any, for Bonds of such Series; and (vi) the purchaser or purchasers of the Bonds of such Series and the purchase price or prices therefor.

3. The Bonds of each Series shall be executed by the Issuer for issuance under the Resolution and delivered to the Trustee and thereupon shall be authenticated by the Trustee and by it delivered to the Issuer or upon its order, but only upon receipt by the Trustee of:

(1) A Counsel's Opinion to the effect that (a) the Board has the right and power under the Act, as amended to the date of such Counsel's Opinion, to adopt this Resolution and the Bond Resolution, if any, and this Resolution and the Bond Resolution, if any, have been duly and lawfully adopted by the Board, are in full force and effect and are valid and binding upon the Issuer and the Company and enforceable in accordance with their terms, and no other authorization for this Resolution and Bond Resolution, if any, is required; (b) this Resolution creates the valid pledge which it purports to create of the Revenues, moneys, securities and funds held or set aside under this Resolution in the manner and to the extent provided in Section 501 hereof; and (c) the Bonds of such Series are valid, binding, special obligations of the Issuer and the Company, enforceable in accordance with their terms and the terms of the Resolution and Bond Resolution, if any, subject to the bankruptcy, insolvency and other laws affecting the rights of creditors generally and entitled to the benefits of the Act as amended to the date of such Opinion, and such Bonds have been duly and validly authorized and issued in accordance with law and this Resolution and Bond Resolution, if any;

(2) A copy, certified by the Secretary of the Board, of the Resolution and the Bond Resolution, if any;

(3) A copy, certified by the Secretary of the Board, of the Sale Resolution adopted by the Board;

(4) For Bonds issued pursuant to Section 203 hereof, an Engineer's Certificate setting forth the estimated Date or Dates of Completion of the Project or Projects, if any, being financed; and

(5) For Bonds issued pursuant to Section 203, 204 or 205 hereof, such further documents and moneys as are required by the provisions of Section 203, 204 or 205 or Article VIII.

4. After the original issuance of the Bonds of any Series, no Bonds of such Series shall be issued except in lieu of or in substitution for other Bonds of such Series pursuant to Article III or Section 906.

Section 203. Special Provisions for Bonds Other than Refunding Bonds. 1. In addition to the Bonds authorized pursuant to Section 205 hereof, one or more Series of Bonds other than Refunding Bonds may be authenticated and delivered upon original issuance pursuant to this subsection 1 in such principal amount or amounts for each such Series as may be determined from time to time by the Board for the purpose of paying or providing for the payment of all



or a portion of the Cost of Construction of one or more Projects in an amount that will provide the Board with funds not in excess of the estimated Cost of Construction of such Project or Projects as set forth in the Engineer's Certificate furnished pursuant to paragraph (2) of subsection 3 of this Section upon the authentication and delivery of the first such Series of Bonds issued in respect of such Project or Projects or paying or providing for the payment of the principal of and interest on any Bond Anticipation Notes.

2. After the authentication and delivery upon original issuance pursuant to subsection 1 of this Section of one or more Series of Bonds in an aggregate principal amount that will provide the Board with funds equal, as nearly as practicable, to the estimated Cost of Construction of a Project or Projects as set forth in the Engineer's Certificate furnished pursuant to paragraph (2) of subsection 3 of this Section, Bonds of one or more additional Series of Bonds may be authenticated and delivered upon original issuance, in each case so that the aggregate principal amount of such additional Series will provide the Company with funds not in excess of the completion requirement set forth in the Engineer's Certificate furnished upon the authentication and delivery of such additional Bonds pursuant to paragraph (4) of subsection 3 of this Section for the purpose of providing the additional funds as nearly as practicable to complete payment of the Cost of Construction of such Project or Projects.

3. Each Series of Bonds issued pursuant to this Section shall be authenticated and delivered by the Trustee only upon receipt by the Trustee (in addition to documents required by Section 202) of:

(1) A Counsel's Opinion to the effect that the Company has good right and lawful authority under the Act as amended to the date of such Opinion to undertake the Project or Projects, if any, being financed with the proceeds of such Series of Bonds, subject to obtaining such licenses, orders or other authorizations as are, at the date of such Opinion, required to be obtained from any agency or regulatory body having lawful jurisdiction in order to undertake such Project or Projects;

(2) In the case of the authentication and delivery of the Bonds of the first such Series in respect of such Project or Projects pursuant to subsection 1 of this Section, an Engineer's Certificate setting forth the estimated Cost of Construction of such Project or Projects;

(3) A Certificate of an Authorized Officer to the effect that, upon the authentication and delivery of the Bonds of such Series, the Issuer will not be in default in the performance of the terms and provisions of this Resolution or any Sale Resolution; and

(4) In the case of the authentication and delivery of Bonds of each Series issued pursuant to subsection 2 of this Section, an Engineer's Certificate setting forth the completion requirement: to wit, the amount which, together with all other amounts available therefor (as determined by an Authorized Officer), is necessary and sufficient to complete the payment of the Cost of Construction of such Project or Projects being completed.

4. Each such Series of Bonds, any portion of the proceeds of which are to be applied to pay the Cost of Construction of any Project or Projects for which Bonds have not theretofore been issued, shall be authenticated and delivered by the Trustee only upon receipt by the Trustee (in addition to documents required by Section 202 and the foregoing subsections of this Section) of:

(1) An Engineer's Certificate or Engineers' Certificates which set forth the estimated Cost of Construction of each uncompleted Project, or, in the case of each completed Project a Certificate of an Authorized Officer which sets forth the Cost of Construction thereof, including any Project specified in the Bond Resolution authorizing such Series of Bonds for which the proceeds of such Bonds will be applied;

(2) A Certificate of an Authorized Officer setting forth the total principal amount of Bonds then estimated to be Outstanding upon completion of the Project or Projects for which Bonds have not theretofore been issued and the resulting amount of Aggregate Bond Service for each Bond Fiscal Year to and including the year of estimated final retirement of all Outstanding Bonds previously issued; and

(3) A Certificate of an Authorized Officer setting forth that in the Fiscal Year immediately preceding the date of such Certificate the maximum Aggregate Bond Service for any future Fiscal Year multiplied by one and three-tenths (1.3) will not exceed the estimated Net Revenues for such immediately preceding Fiscal Year.

Such "Net Revenues" may be adjusted for the purpose of the foregoing computations to reflect (i) any revisions in the schedule of rates and charges being imposed for the services of the Waterworks System at the time of issuance of such additional Series of Bonds, and (ii) any increase in such Net Revenues projected to be produced after the issuance of such Series of Bonds by reason of the revenues anticipated to be derived from the extensions, additions, facilities and/or improvements to the Waterworks System being financed by such additional Series of Bonds, provided (A) no projection for such latter adjustment shall be made as to any customers other than (i) units of government or similar entities which have entered into legally enforceable take or pay contracts for water service and

(ii) structures, dwellings, businesses and/or manufacturing establishments in existence at the time of issuance of such Series of Bonds, located on or which will abut on extensions, additions and/or improvements to the Waterworks System in existence at the time of the issuance of such Series of Bonds and/or being financed in whole or in part) by such additional Series of Bonds and (B) such latter adjustment shall be made only if contracts for the immediate acquisition and/or construction of such extensions, additions and/or improvements have been or will have been entered into (with any construction contract being secured by 100% performance bond) prior to the issuance of such additional Series of Bonds. All adjustments provided for in this paragraph shall be based only upon written Engineer's Certificate.

5. The proceeds, including accrued interest, of each such Series of Bonds shall be applied simultaneously with the delivery of such Bonds as follows:

- (1) The sum, if any, specified in the Bond Resolution authorizing such Series of Bonds shall be paid (or provision for payment made) to the holders of the Issuer's outstanding Bond Anticipation Notes or other notes or obligations and upon such payment such Bond Anticipation Notes, or other notes or obligations shall be cancelled;
- (2) There shall be deposited with the Company an amount, determined by an Authorized Officer, to be necessary to pay the costs of the issuance of such Bonds;
- (3) There shall be deposited in the Reserve Account the amount, if any, required pursuant to the Bond Resolution or Sale Resolution;
- (4) Accrued interest and capitalized interest, if any, shall be deposited in the Bond Service Account; and
- (5) The remaining balance of the proceeds of such Bonds shall be deposited in the Construction and Acquisition Fund.

Section 204. Special Provisions for Refunding Bonds. 1. One or more Series of Refunding Bonds may be authenticated and delivered upon original issuance to refund all or part of the principal and/or interest on Outstanding Bonds. Refunding Bonds shall be issued in a principal amount sufficient, together with other moneys available therefor, to accomplish such refunding and to make the deposits in the Reserve Account required by the provisions of this Section and of the Bond Resolution authorizing said Bonds. Refunding Bonds and Bonds described in Section 203 may be issued in a single Series.

2. Each Series of Refunding Bonds issued to refund one or more Series of Outstanding Bonds shall be authenticated and

delivered by the Trustee only upon receipt by the Trustee (in addition to the documents required by Section 202) of:

(1) Irrevocable instructions by the Issuer to the Trustee, satisfactory to it, to give due notice of redemption, if applicable, of all the Bonds to be redeemed on the redemption date, it being permissible for such instructions to state that Bonds are to be redeemed during a certain period only upon the happening of a subsequent event specified in such instructions;

(2) Irrevocable instructions by the Issuer to the Trustee, satisfactory to it, to give the notice, if applicable, provided for in Section 1101 to the Holders of the Bonds being refunded;

(3) Either (i) moneys in an amount sufficient to effect payment of the principal or Redemption Price of the Bonds to be refunded, together with accrued interest on such Bonds to the date of maturity or the redemption date, which moneys shall be held by the Trustee or any one or more of the escrow agents (any such escrow agent being subject to the provisions of Article VII of this Indenture) in a separate account irrevocably in trust for and assigned to the respective Holders of the Bonds to be refunded, or (ii) Government Obligations in such principal amounts, of such maturities, bearing such interest, and otherwise having such terms and qualifications, as shall be necessary to comply with the provisions of subsection 2 of Section 1101, or obligations the principal of and interest on which will mature and become payable prior to the times that such amounts are needed to pay the entire principal of, or redemption price, and interest on the Bonds, such obligations being (A) validly issued by or on behalf of a state or political subdivision thereof and (B) fully secured by a first lien on Government Obligations in such principal amounts, of such maturities, bearing such interest, and otherwise having such terms and qualifications as shall be necessary to comply with the provisions of subsection 2 of Section 1101;

(4) If applicable, the Certificate set forth in paragraph (4) of subsection 3 of Section 203; and

(5) Unless the Certificates described in subsection 3 of this Section are provided, a Certificate of an Authorized Officer setting forth (i) the Bond Service on the Bonds to be refunded for each Bond Fiscal Year in which such Bond Service is payable, (ii) the Bond Service on the Refunding Bonds for each Bond Fiscal Year in which such Bond Service is payable and (iii) that the aggregate of the amounts computed under clause (ii) of this paragraph for each Bond Fiscal Year described in such clause is less than the

amount computed under clause (i) of this paragraph for each Bond Fiscal Year described in such clause.

3. Unless the Certificate described in paragraph 5 of subsection 2 of this Section is provided, each Series of Refunding Bonds issued to refund one or more Series of Outstanding Bonds shall be authenticated and delivered by the Trustee only upon receipt by the Trustee of:

(1) A Certificate of an Authorized Officer setting forth the amount of Aggregate Bond Service for each Bond Fiscal Year to and including the year of estimated final retirement of all Outstanding Bonds previously issued; and

(2) A Certificate of an Authorized Officer setting forth that in the Fiscal Year immediately preceding the date of such Certificate, the Net Revenues will be at least 1.30 times the maximum Aggregate Bond Service coming due in any future Fiscal Year.

4. The proceeds, including accrued interest, of each such Series of Bonds shall be applied simultaneously with the delivery of such Bonds as follows:

(1) There shall be deposited with the Issuer an amount, determined by an Authorized Officer, to be necessary to pay the costs of the issuance of such Bonds;

(2) There shall be deposited in the Reserve Account the amount, if any, required pursuant to the Sale Resolution;

(3) Accrued interest shall be deposited in the Bond Service Account; and

(4) The remaining balance of the proceeds of such Bonds shall be deposited in a separate account in trust with a Fiduciary for the payment and discharge of the refunded Bonds.

Section 205. Authorization of Series 1992 Bonds; Principal Amount; Designation and Series.

1. General. In accordance with and subject to the Act and this Resolution, the Series 1992 Bonds are hereby authorized to be issued in the aggregate principal amount of \$74,835,000. The Issuer hereby determines that the issuance of the Series 1992 Bonds in the principal amount of \$74,835,000 is necessary for the funding of the proper governmental purposes of the Issuer and for the more specific purposes set forth in this Resolution, including the funding of the Qualified 1992 Project Costs. The Issuer further hereby determines that all said purposes are authorized by the Act. As provided by Section 201 of this Resolution, in addition to the title "Water System Revenue Bonds," the Series 1992 Bonds herein authorized shall bear the additional designation of "Series 1992" and each Bond as so

designated shall be a "Water System Revenue Bond, Series 1992." The Series 1992 Bonds shall be issued under the Book-Entry System authorized by Section 207 of this Resolution.

2. Purpose of Issuance of Series 1992 Bonds. The purposes for which the Series 1992 Bonds are being issued are the purposes enumerated in Section 104 and in other provisions of this Resolution, including the funding of the Qualified 1992 Project Costs. It is hereby determined that immediately following the issuance of the Series 1992 Bonds, moneys on deposit in the Reserve Account will at least equal the Bond Reserve Requirement.

3. Issue Date. The Series 1992 Bonds shall be dated August 1, 1992.

4. Principal Payments. The Series 1992 Bonds shall consist of \$74,835,000 principal amount of Serial Bonds (subject to being redesignated as Sinking Fund Installments at the time of the competitive sale of the Series 1992 Bonds), all the same maturing on November 15 of the years, as follows:

<u>Date of Principal Payments</u>	<u>Principal Amount</u>	<u>Interest Rate</u>
November 15, 1995	\$ 2,155,000	4.50%
November 15, 1996	2,250,000	4.50%
November 15, 1997	2,360,000	4.50%
November 15, 1998	2,480,000	4.70%
November 15, 1999	2,605,000	4.80%
November 15, 2000	2,740,000	5.00%
November 15, 2001	2,890,000	5.10%
November 15, 2002	3,050,000	5.25%
November 15, 2003	3,225,000	5.30%
November 15, 2004	3,410,000	5.40%
November 15, 2005	3,605,000	5.50%
November 15, 2006	3,820,000	5.625%
November 15, 2007	4,045,000	5.625%
November 15, 2008	4,290,000	5.75%
November 15, 2009	4,550,000	5.75%
November 15, 2010	4,835,000	5.75%
November 15, 2013	16,375,000	5.75%
November 15, 2014	6,150,000	6.00%

NOTE: The provisions of this subsection 4 reflect the results of the competitive sale of the Series 1992 Bonds.

5. Denominations and Numbers. The Series 1992 Bonds shall be issuable as fully registered Bonds without coupons in denominations of \$5,000 principal amount or any integral multiple thereof. The Series 1992 Bonds shall be numbered from 1 consecutively upwards. The Series 1992 Bonds shall bear interest to maturity, payable on each May 15 and November 15, commencing November 15, 1992.

6. Payment. Principal or Redemption Price of the Series 1992 Bonds shall be paid upon surrender thereof at the principal corporate trust office of the Trustee. Interest on the Series 1992 Bonds shall be paid by check or draft mailed by the Trustee to the registered owner at the address shown on the registration books maintained by the Trustee as of the Record Date which shall be the May 1 and November 1 of each Bond Fiscal Year; provided however, that payment of such interest with respect to the Series 1992 Bonds shall be made by wire transfer in federal funds to any Bondholder of an aggregate amount of Series 1992 Bonds of at least \$1,000,000, if such Bondholder shall have requested in writing to the Trustee payment by such method.

7. Redemption of Series 1992 Bonds; Redemption Terms and Prices.

(a) Optional Redemption. The Series 1992 Bonds maturing on and after November 15, 2001 are subject to redemption, at the option of the Issuer, on or after November 15, 2000, in whole or in part on any date at the redemption prices (expressed as percentages of the principal amount of such Bonds to be redeemed) plus accrued interest to date of redemption set forth below:

<u>Redemption Periods (Dates Inclusive)</u>	<u>Redemption Price</u>
November 15, 2000 November 14, 2001.....	102%
November 15, 2001 November 14, 2002.....	101%
November 15, 2002 and thereafter.....	100%

In the event of optional redemption, in part, the Issuer may direct the maturity or maturities, and the amounts thereof, to be so redeemed.

(b) Sinking Fund Redemption. If so elected by the lowest and best bidder upon the occasion of the competitive sale of the Series 1992 Bonds, the Series 1992 Bonds may be made subject to mandatory Sinking Fund Installments, provided that each such Sinking Fund Installment shall be payable as to principal in accordance with the schedule of serial maturities set forth in paragraph 4 of this Section 205.

NOTE: Upon the basis of the competitive sale of the Series 1992 Bonds, the following mandatory Sinking Fund Installments were ordered:

Series 1992 Term Bonds Maturing November 15, 2013

<u>Sinking Fund Installments</u>	<u>Amount</u>
November 15, 2011	\$5,135,000
November 15, 2012	5,450,000
November 15, 2013	5,790,000

Series 1992 Term Bonds Maturing November 15, 2014

Sinking Fund Installments  
November 15, 2014

Amount  
\$6,150,000

8. Application of the Proceeds of the Series 1992 Bonds.  
The net proceeds of the Series 1992 Bonds shall be applied as follows:

(a) There shall be deposited into the Bond Service Account of the Bond Fund all sums received as accrued interest plus capitalized interest as determined by a Certificate of an Authorized Officer.

(b) There shall be transferred to the Escrow Agent and deposited in the Escrow Fund pursuant to the Escrow Agreement for defeasance, payment and discharge of the 1986A Bonds and payment of interest on the 1986B Bonds coming due on November 15, 1992 such amount as shall be determined by the Certificate of an Authorized Officer.

(c) There shall be paid and discharged any notes or obligations incurred for the interim financing of the 1992 Project (the Series 1 Note) and there shall be reimbursed to the Issuer any amounts directly advanced from Issuer funds for the interim financing of the 1992 Project.

(d) There shall be transferred to a special account of the Board to be held by the Trustee hereby created and denominated "Costs of Issuance Account - Series 1992 Bonds" (the "Cost of Issuance Account") such amount as shall be determined by the Certificate of an Authorized Officer.

(e) There shall be transferred to the Trustee for deposit to the Construction and Acquisition Fund such amount as shall be determined by the Certificate of an Authorized Officer.

In addition to the foregoing, there shall be retained in the Reserve Account an amount at least equal to the Bond Reserve Requirement.

9. The Escrow Agreement, in substantially the form submitted to the meeting of the Board at which this Resolution is adopted, is hereby approved, and the Authorized Officers of the Issuer or any of them, are hereby authorized to execute and deliver the Escrow Agreement, with such revisions, insertions and deletions as any such Authorized Officer shall approve, such approval to be conclusively evidenced by the execution thereof.

10. Any Authorized Officer is hereby authorized to take, on behalf of the Issuer, any actions and execute and deliver any documents necessary with respect to the issuance of the Series 1992 Bonds.



11. The Issuer certifies, on the basis of known facts and circumstances in existence on the date of adoption of this Resolution, that it is not expected that the proceeds of the Series 1992 Bonds or the Revenues of the System or the application and use of any moneys of the Company and/or the Issuer, including 1986A and 1986B Bond Funds and Accounts will be used in a manner which would cause the Series 1992 Bonds to be arbitrage bonds within the meaning of the Code. The Issuer covenants with the Holders of the Series 1992 Bonds that (1) the Issuer will make no use of the proceeds of said Series 1992 Bonds, or apply or use any moneys of the Company and/or the Board, including 1986A and 1986B Bond Funds and Accounts which, if such use had been reasonably expected on the date of issue of such Series 1992 Bonds, would have caused such Series 1992 Bonds to be arbitrage bonds within the meaning of the Code and (2) that the Issuer will comply with all of the requirements of Section 148 of the Code.

Section 206. Authorization of Series 2 Note. 1. The Series 2 Note is hereby authorized in the principal amount of \$8,000,000 and shall be issued on the date of issuance of the Series 1992 Bonds. Authorized Officers are hereby authorized and directed to execute and deliver the Series 2 Note and all necessary and appropriate papers and documents in connection therewith.

2. The Series 2 Note shall mature, bear interest, be payable, be subject to redemption and generally have the characteristics set forth in Exhibit B, attached hereto.

3. The Series 2 Note shall rank on a basis of parity and equality with all Outstanding Bonds issued under the Resolution. There shall be established within the Reserve Account of the Bond Fund a separate subaccount in respect of the Series 2 Note, identified as the "Series 2 Note Reserve," which shall contain the Series 2 Note Reserve Requirement. The Series 2 Note Reserve Requirement is hereby established as \$1,440,400.00, which Series 2 Note Reserve Requirement shall not change prior to the final maturity of the Series 2 Note and any other note or obligation issued by the Company for the refunding of the Series 2 Note so long as such final maturity of such Series 2 Note and such refundings shall not be later than August 1, 1994. Upon payment and discharge of the Series 2 Note, moneys in the Series 2 Note Reserve shall be transferred to the Company.

Section 207. Book-Entry System. Upon order of the Issuer, any Series of Bonds may be issued pursuant to the Book-Entry System. (a) Whenever and so long as a Series of Bonds is held in the Book-Entry System, the Registered Owner of all of the Bonds of such Series shall be DTC, and the Series of Bonds shall be registered in the name of CEDE & Co., as nominee for DTC. The provisions of the Letter of Representations shall be and are hereby incorporated herein by reference and in the event that there shall be any inconsistency between the Letter of Representations and this Resolution, whenever and so long as the relevant Series of Bonds is held in the Book-Entry System, the Letter of Representations shall govern.

(b) The Series 1992 Bonds shall be issued in the Book-Entry System form and shall be initially represented by a single fully registered certificate for each maturity thereof in accordance with the Letter of Representations. Upon initial issuance, the ownership of the Series 1992 Bonds shall be registered in the registry books of the Issuer maintained by the Trustee in the name of CEDE & Co., as nominee for DTC. So long as the Series 1992 Bonds are held in the Book-Entry System, the Trustee and the Issuer may treat DTC (or its nominee) as the sole and exclusive Registered Owner of the Series 1992 Bonds registered in its name for the purposes of payment of the principal or redemption price of or interest on Series 1992 Bonds, selecting Series 1992 Bonds or portions thereof to be redeemed, giving any notice permitted or required to be given to Bondholders under this Resolution, registering the transfer of the Series 1992 Bonds, and obtaining any consent or other action to be taken by Bondholders and for all other purposes whatsoever; and the Trustee and the Issuer shall not be affected by any notice to the contrary. The Trustee and the Issuer shall have no liability, responsibility or obligation to any DTC Participant, any Beneficial Owner or any person claiming to be a Beneficial Owner, or any other person which is not shown on the registration books of the Trustee as being a Registered Owner with respect to: the accuracy of or any other aspect relating to any records maintained by DTC or any DTC Participant; the payment to Beneficial Owners by DTC or any DTC Participant of any amount in respect of the principal of or interest or premium on the Series 1992 Bonds; any notice which is permitted or required to be given to Bondholders under this Resolution once such notice is given to DTC, as Bondholder, in accordance with this Resolution; the selection by DTC or any DTC Participant of any person to receive payment in the event of a partial redemption of the Series 1992 Bonds; or any consent given or other action taken by DTC as Bondholder.

(c) Whenever and so long as the Series 1992 Bonds are held in the Book-Entry System, the Trustee shall pay from moneys available hereunder all principal of and premium, if any, and interest on the Bonds only to or "upon the order of" DTC (as that term is used in the Uniform Commercial Code as adopted in the Commonwealth of Kentucky), and all such payments shall be valid and effective to fully satisfy and discharge the Issuer's obligation with respect to the principal of and premium, if any, and interest on the Series 1992 Bonds to the extent of the sum or sums so paid. Transfer or crediting of the applicable principal, interest or redemption premium payments made by the Trustee to DTC by DTC to DTC Participants shall be the sole responsibility of DTC, and transfer of same to Beneficial Owners or their nominees shall be the sole responsibility of DTC and the DTC Participants. So long as the Series 1992 Bonds are held in the Book-Entry System, no person other than DTC shall receive an authenticated Bond certificate.

(d) Upon delivery by DTC to the Trustee of DTC's written notice to the effect that DTC has determined to substitute a new nominee in place of CEDE & Co., and subject to the provisions of this Resolution with respect to transfer of the Series 1992 Bonds,

the term "CEDE & Co." in this Resolution shall refer to such new nominee of DTC.

Section 208. Termination of Book-Entry System; Delivery of Bond Certificates. (a) At any time, the Issuer may terminate the Book-Entry System in which event (i) the Issuer shall notify DTC and the Trustee, and shall instruct DTC to notify the DTC Participants, of the availability through DTC of definitive Bond certificates and (ii) the Trustee shall issue, transfer and exchange, at the Issuer's expense, definitive Bond certificates as requested in writing by DTC in appropriate amounts.

(b) At any time, DTC may determine to discontinue providing its services with respect to the Series 1992 Bonds by giving written notice to the Issuer and the Trustee in accordance with the Letter of Representations and discharging its responsibilities under applicable law with respect to the Series 1992 Bonds. Under such circumstances (unless a successor to DTC which is reasonably acceptable to Trustee has been appointed to act as securities depository hereunder), Issuer and Trustee shall be obligated to deliver definitive Bond certificates as described in this Resolution.

Section 209. Bond Anticipation Notes. Whenever the Issuer shall by resolution, authorize the issuance of a Series of Bonds, the Board, may, by resolution, authorize the issuance of Bond Anticipation Notes in anticipation of the sale of such authorized Series of Bonds in a principal amount not exceeding the principal amount of such Series. The spendable proceeds of such Series shall not exceed, when combined with the principal amount of Bonds previously authenticated and delivered to pay the Cost of Construction of such Project or Projects for which the proceeds of the Notes will be applied, such estimated Cost of Construction as set forth in the Engineer's Certificate furnished pursuant to paragraph (2) of subsection 3 of Section 203, or the amount of the completion requirement as set forth in an Engineer's Certificate filed with the Trustee upon the adoption of the Bond Resolution authorizing such Series of Bonds, to wit: the amount which, together with all other amounts available therefor (as determined by an Authorized Officer), is necessary and sufficient to complete the payment of the Cost of Construction of such Project or Projects. The interest on such Notes may be payable out of the Bond Fund to the extent provided in the resolution of the Board authorizing such Notes. The principal of and, unless payable out of the Bond Fund, interest on such Notes and renewals thereof shall be payable from the proceeds of the sale of the Series of Bonds in anticipation of which such Notes are issued. Such proceeds may be pledged for the payment of the principal of and interest on such Notes and any such pledge shall have priority over any other pledge created by this Resolution. The proceeds of sale of Bond Anticipation Notes shall be applied to the purposes for which the Bonds anticipated by such Notes are authorized and shall be deposited in the appropriate fund or account established by the resolution for such purposes; provided, however, that the resolution or resolutions authorizing such Notes may provide for the payment of interest on such Notes from the proceeds of sale of such Notes.

Section 210. Alternative Evidencing of Bonds. The Issuer reserves the right and option, in the issuance of any Series of Bonds, to cause such Series to be issued in any alternative form, including, but not by way of limitation, Discount Bonds, capital appreciation bonds, variable rate demand obligations, optional and mandatory tender bonds and bonds secured or not secured by credit facilities, liquidity facilities, letters and lines of credit, guarantees and bond insurance agreements, all as may be provided in the Bond Resolution authorizing any such Series of Bonds. The Issuer further reserves the right and option, to the extent permitted by law, to enter into interest rate exchange agreements in connection with the issuance of any Series of Bonds. In the event any such bonds or other obligations are by their terms payable as to principal and/or interest on other than a semiannual basis, the provisions of Section 505(1)(a) and (b) of this Resolution shall be deemed to require payment of such principal and interest on the dates stipulated in such bonds or other obligations and the Board and the Issuer each covenants that such payments will be timely made when due.

### ARTICLE III

#### FORM, EXECUTION, AUTHENTICATION AND REGISTRATION OF BONDS

Section 301. Place and Medium of Payment. The Bonds of a Series shall be payable as to principal or Redemption Price of and interest thereon in lawful money of the United States of America.

The Bonds of a Series shall be issued in the form of fully registered Bonds without coupons.

Payment of the principal of Bonds, upon presentation and surrender thereof at the principal corporate trust office of the Trustee or Paying Agents, if any, shall be made to the person appearing on the registration books of the Issuer maintained by the Bond Registrar provided for herein as the registered owner thereof. Payment of interest on registered Bonds shall be made by check or draft mailed to the registered owner at his address, as the same appears on such registration books on the fifteenth day next preceding the interest payment date.

Section 302. Legends. The Bonds of each Series may contain or have endorsed thereon such provisions, specifications and descriptive words not inconsistent with the provisions of this Resolution as may be necessary or desirable to comply with custom, the rules of any securities exchange or commission or brokerage board, or otherwise, as may be determined by the Issuer prior to the authentication and delivery thereof.

Section 303. Execution, Authentication and Form of Bonds.

1. The Bonds shall be executed by the manual or facsimile signature of the President of the Issuer and shall be sealed by imprinting

thereon a manual or facsimile of the official seal of the Issuer, attested by the manual or facsimile signature of the Treasurer of the Issuer. If any officer whose signature or facsimile of whose signature shall appear on any Bonds shall cease to be such officer before the delivery of the Bonds, his or her signature or such facsimile shall nevertheless be valid and sufficient for all purposes the same as if he had remained in office until such delivery.

2. The Bonds issued under this Resolution, together with the certificate of authentication by the Trustee, shall be substantially in the form set forth as Exhibit A to this Resolution, with such variations, omissions and insertions as are consistent with the terms of the Bond Resolution, if any, and Sale Resolution, in respect of a Series of Bonds.

Section 304. Authentication of Bonds. Only such of the Bonds as shall have endorsed thereon a certificate of authentication substantially in the form hereinafter set forth, duly executed by the Trustee, shall be entitled to any right or benefit under this Resolution. No Bond shall be valid or obligatory for any purpose unless and until such certificate of authentication shall have been duly executed by the Trustee, and such certificate of the Trustee upon any such Bond shall be conclusive evidence that such Bond has been duly authenticated and delivered under this Resolution. The Trustee's certificate of authentication on any Bond shall be deemed to have been duly executed if signed by an authorized officer of the Trustee, but it shall not be necessary that the same officer sign the certificate of authentication on all of the Bonds which may be issued hereunder at any one time.

Section 305. Negotiability, Transfer and Registration. All of the Bonds of any Series issued under this Resolution shall be negotiable, subject to the provisions for registration and transfer contained in this Resolution and in the Bonds. So long as any of the Bonds shall remain Outstanding, the Issuer shall maintain and keep, at the principal corporate trust office of the Trustee, books for the registration and transfer of Bonds; and, upon presentation thereof for such purpose at said office, the Issuer shall register or cause to be registered therein, and permit to be transferred thereon, under such reasonable regulations as it or the Trustee may prescribe, any Bond entitled to registration or transfer. So long as any of the Bonds remain Outstanding, the Issuer shall make all necessary provision to permit the exchange of Bonds at the principal office of the Trustee.

Each Bond shall be transferable only upon the registration books of the Issuer, by the registered owner thereof in person or by his attorney or duly authorized legal representative duly authorized in writing, upon surrender thereof together with a written instrument of transfer satisfactory to the Trustee duly executed by the registered owner or his attorney or duly authorized legal

representative. Upon the transfer of any such registered Bond the Issuer shall issue in the name of the transferee a new registered Bond or Bonds, of the same aggregate principal amount and Series and maturity as the surrendered Bond.

In all cases in which the privilege of exchanging Bonds or transferring Bonds is exercised, the Issuer shall execute and the Trustee shall authenticate and deliver Bonds in accordance with the provisions of this Resolution. All Bonds surrendered in any such exchanges or transfers shall forthwith be cancelled by the Trustee. For every such exchange or transfer of Bonds, whether temporary or definitive, the Issuer or the Trustee may make a charge sufficient to reimburse it for any tax, fee or other governmental charge required to be paid with respect to such exchange or transfer. Neither the Trustee nor the Issuer shall be obliged to make any such exchange or transfer of Bonds of any Series during the fifteen (15) days next preceding an interest payment date on the Bonds of such Series or, in the case of any proposed redemption of Bonds of such Series, next preceding the date of the first mailing of notice of such redemption.

Section 306. Ownership of Bonds. The person in whose name any Bond shall be registered shall be deemed and regarded as the absolute owner thereof for all purposes and payment of or on account of the principal of any such Bond shall be made only to or upon the order of the registered owner thereof, his attorney or his duly authorized legal representative, but such registration may be changed as herein provided. All such payments shall be valid and effectual to satisfy and discharge the liability upon such Bond to the extent of the sum or sums so paid.

Section 307. Temporary Bonds. Until the definitive Bonds of any Series are ready for delivery, there may be executed, and upon request of the President of the Issuer the Trustee shall authenticate and deliver, in lieu of definitive Bonds and subject to the same limitations and conditions except as to identifying numbers, temporary printed, engraved, lithographed or typewritten Bonds in the denominations specified by the Board, substantially of the tenor hereinabove set forth, and with appropriate omissions, insertions and variations as may be required. The Issuer shall cause the definitive Bonds to be prepared and to be executed, endorsed and delivered to the Trustee, and the Trustee, upon presentation to it of any temporary Bond, shall cancel the same and authenticate and deliver, in exchange therefor, at the place designated by the holder, without expense to the holder, a definitive Bond or Bonds of the same Series and in the same aggregate principal amount, maturing on the same date and bearing interest at the same rate as the temporary Bond surrendered. Until so exchanged the temporary Bonds shall in all respects be entitled to the same benefit of this Resolution as the definitive Bonds to be issued and authenticated hereunder, and interest on such temporary Bonds when payable, shall be paid on presentation of such temporary Bonds and notation of such payment shall be endorsed thereon.



Section 308. Mutilated, Lost or Destroyed Bonds. In case any Bond issued hereunder shall become mutilated or be destroyed or lost, the Trustee may authenticate and deliver, a new Bond of like Series, date, number, maturity and tenor in exchange and substitution for and upon the cancellation of such mutilated Bond, or in lieu of and in substitution for such Bond destroyed or lost, upon the Holder's paying the reasonable expenses and charges in connection therewith and, in the case of a Bond destroyed or lost, his filing with the Trustee evidence satisfactory to it that such Bond was destroyed or lost, and of his ownership thereof, and furnishing the Trustee with indemnity satisfactory to them.

#### ARTICLE IV

##### REDEMPTION OF BONDS

Section 401. Privilege of Redemption and Redemption Price. Bonds of a Series subject to redemption prior to maturity pursuant to a Bond Resolution or Sale Resolution authorizing such Series shall be redeemable, upon notice as provided in this Article IV, at such times, at such Redemption Prices and upon such terms (in addition to and consistent with the terms contained in this Article IV) as may be specified in the Bond Resolution or Sale Resolution authorizing such Series.

Section 402. Redemption at the Election of the Board. In the case of any redemption of Bonds otherwise than as provided in Section 403, the Board shall give written notice to the Trustee of the election so to redeem, of the redemption date, of the Series, of the principal amounts of the Bonds of each maturity of such Series to be redeemed (which Series, maturities and principal amounts thereof to be redeemed shall be determined by the Board in its sole discretion, subject to any limitations with respect thereto contained in any Bond Resolution authorizing a Series of Bonds). Such notice shall be given to the Trustee at least forty (40) days prior to the redemption date, whereupon the Trustee shall immediately give notice of redemption to the Bondholders as required by this Resolution. In the event notice of redemption shall have been given as in Section 405 provided, the Trustee shall, on the redemption date, or such earlier date as the Board may direct, pay out of moneys available therefor to itself and the appropriate Paying Agent or Paying Agents an amount in cash which, in addition to other moneys, if any, available therefor held by itself and such Paying Agent or Paying Agents, will be sufficient to redeem on the redemption date at the Redemption Price thereof together with accrued interest to the redemption date, all of the Bonds to be redeemed.

Section 403. Redemption Otherwise Than at Issuer's Election. Whenever by the terms of the Resolution, a Bond Resolution or a Sale Resolution, Bonds are required to be redeemed otherwise than at the election of the Issuer, the Trustee shall select the

Bonds to be redeemed, give the notice of redemption and pay out of moneys available therefor the Redemption Price, together with accrued interest to the redemption date, to itself and the appropriate Paying Agents in accordance with the terms of this Article IV.

Section 404. Selection of Bonds to be Redeemed by Lot. In the event of redemption of less than all the Outstanding Bonds of like Series and maturity, the Trustee shall select by lot the numbers of the Bonds to be redeemed. For the purposes of this Section 404, Bonds which have theretofore been selected for redemption shall not be deemed Outstanding. In the event that one or more Term Bonds are redeemed, otherwise than pursuant to any Sinking Fund Installment therefor, there shall be credited against such Sinking Fund Installments for such Term Bonds as the Board shall direct, the principal amount of the Term Bonds so redeemed.

Section 405. Notice of Redemption. When the Trustee shall receive notice from the Issuer of its election to redeem Bonds pursuant to Section 402, and when redemption of Bonds is required pursuant to Section 403, the Trustee shall give notice, in the name of the Issuer, of the redemption of such Bonds, which notice shall specify the Series and maturities of the Bonds to be redeemed, the redemption date and the place or places where amounts due upon such redemption will be payable and, if less than all of the Bonds of any like Series and maturity are to be redeemed, the numbers or other distinguishing marks of such Bonds so to be redeemed. Such notice shall further state that on such date there shall become due and payable upon each Bond to be redeemed the Redemption Price thereof, together with interest accrued to the redemption date, and that from and after such date interest thereon shall cease to accrue and be payable. The Trustee shall mail a copy of such notice, postage prepaid, not less than thirty (30) days before the redemption date, to the registered owners of any Bonds which are to be redeemed, at their last addresses, if any, appearing upon the registry books, but failure so to mail any such notice to the registered owner of any Bond shall not affect the validity of the proceedings for the redemption of any other Bonds.

Section 406. Payment of Redeemed Bonds. Notice having been given by mail in the manner provided in Section 405, the Bonds so called for redemption shall become due and payable on the redemption date so designated at the Redemption Price, plus interest accrued and unpaid to the redemption date, and, upon presentation and surrender thereof at the office specified in such notice, such Bonds shall be paid at the Redemption Price plus interest accrued and unpaid to the redemption date. If, on the redemption date, moneys for the redemption of all the Bonds of any like Series and maturity to be redeemed, together with interest to the redemption date, shall be held by the Trustee and Paying Agent or Agents so as to be available therefor on said date and if notice of redemption shall have been mailed as aforesaid, then, from and after the redemption



date interest on the Bonds of such Series and maturity so called for redemption shall cease to accrue and become payable. If said moneys shall not be so available on the redemption date, such Bonds or portions thereof shall continue to bear interest until paid at the same rate as they would have borne had they not been called for redemption.

## ARTICLE V

### ESTABLISHMENT OF FUNDS AND APPLICATION THEREOF

Section 501. The Lien Created by this Resolution. 1. The Bonds do not constitute indebtedness of the Issuer, the City of Louisville, Kentucky or any instrumentality thereof, including the Company, within the meaning of the Constitution of the Commonwealth of Kentucky or a pledge of the faith and credit of the City or the Issuer, but are payable solely as provided herein from Revenues of the Waterworks System and other funds pledged therefor, and neither the City, the Company or the Issuer is obligated to pay the Bonds except as provided herein. The issuance of any Bonds hereunder shall not directly, indirectly or contingently obligate the City to levy or to pledge any taxes whatsoever for the payment of such Bonds or to make any appropriation for such payment except from the Funds and Accounts provided herein.

2. There are hereby pledged for the payment of the principal and Redemption Price of, interest on, and Sinking Fund Installments for, the Bonds, for the purposes and on the terms and conditions set forth in this Resolution, (a) the proceeds of sale of the Bonds except for the proceeds of the sale of the Series 1992 Bonds pursuant to Section 205 hereof applied to the refunding of the 1986A Bonds and the payment of interest on the 1986B Bonds coming due on November 15, 1992, (b) all Revenues and (c) all amounts held in the Funds and Accounts created hereunder. The pledge hereby made (i) shall be subject to the provisions of this Resolution permitting the application of Bond proceeds, Revenues and amounts in the Funds and Accounts established by this Resolution for the purposes set forth in this Resolution, (ii) shall not apply to amounts set aside for the payment of Bonds or Notes pursuant to Sections 204 or 209 and (iii) shall be subject to the lien of the Prior Lien Bonds only in the event that, and only to the extent that, moneys set aside for the payment of such Prior Lien Bonds is insufficient to pay the principal of and interest on such Prior Lien Bonds as they become due.

3. The pledge shall be valid and binding from and after the date of delivery of the first Series of Bonds pursuant to Section 205 hereof, and the proceeds of sale of the Bonds and all the Revenues, moneys, securities and funds as received by the Company as set forth in paragraph 2 of this Section 501 shall immediately be subject to the lien of the pledge without any physical delivery thereof or further act, and the lien of the pledge

shall be immediately perfected and shall be valid and binding as against all parties having claims of any kind in tort, contract or otherwise against the Issuer of the Company irrespective of whether such parties have notice thereof.

Section 502. Establishment of Funds.

1. There are hereby established certain Funds and Accounts of the Company, and all of the same shall be maintained and continued in effect at all times while the Bonds remain Outstanding, as follows:

- (1) Construction and Acquisition Fund, to be held by the Trustee; (individual accounts shall be established, maintained and accounted for within such Fund in respect of each relevant Series of Bonds), including  
the Cost of Issuance Account, to be held by the Trustee in a separate account within the Construction Fund;
- (2) Revenue Fund, to be held by a Depositary designated by the Board;
- (3) Bond Fund, to be held by the Trustee, including
  - (i) a Bond Service Account, and
  - (ii) a Reserve Account;
- (4) Depreciation Fund, to be held by a Depositary designated by the Board; and
- (5) Operation Fund, to be held by a Depositary designated by the Board; and
- (6) Rebate Fund, to be held by the Trustee.

2. Simultaneously upon issuance of the Series 1992 Bonds authorized by Section 205, an Authorized Officer may direct the Trustee or any depositary under the 1986A Bond Ordinance and 1986B Bond Ordinance to transfer any amounts in any fund or account under the 1986A Bond Ordinance and 1986B Bond Ordinance to any Fund or Account hereunder, or under the Escrow Agreement or to make any other use thereof.

Section 503. Construction and Acquisition Fund. 1. Upon the issuance of a Series of Bonds, an appropriate account in respect thereof shall be created in the Construction and Acquisition Fund. The Company shall, in respect of any Series of Bonds for construction and acquisition of a Project, pay into such account of the Construction and Acquisition Fund, as promptly as practicable, the following amounts received by it:

(i) the proceeds of the sale of Bonds to be applied to the Cost of Construction of a Project to the extent not required for payment of Bond Anticipation Notes or other notes or obligations for interim financing of such Project;

(ii) there shall also be created within the Construction and Acquisition Fund an appropriate Cost of Issuance Account, into which proceeds of the Series shall be deposited, as provided by a Certificate of an Authorized Officer.

(iii) proceeds of Bond Anticipation Notes, to the extent provided in Section 209; and

(iv) such other amounts (not required by the Resolution to be otherwise deposited) as may be provided in the Bond Resolution or Sale Resolution authorizing a particular Series of Bonds; and

Amounts in such Fund account shall be applied to the Cost of Construction of the relevant Project. Notwithstanding the above provisions of this Section, to the extent that any other moneys are not available therefor, amounts in such Fund account shall be applied to the payment of principal of and interest on Bonds when due.

2. The Trustee shall pay from the relevant Construction and Acquisition Fund account to the Company upon its requisitions therefor, signed by its Authorized Officer at one time or from time to time, a sum or sums aggregating not more than Two Hundred Fifty Thousand Dollars (\$250,000) exclusive of reimbursements as hereinafter in this Section authorized, such sum or sums and such reimbursements to be used by the Company as a revolving fund for the payment of items of Cost of Construction which cannot conveniently be paid as herein otherwise provided. The revolving fund shall be reimbursed from time to time for such items of cost so paid by payments from the Construction and Acquisition Fund upon requisitions of the Company similarly signed, specifying the payee and the amount and purpose of each payment from the revolving fund for which such reimbursement is requested, accompanied by a certificate, similarly signed, certifying that each such item so paid was a Cost of Construction and that such item could not conveniently be paid except from such revolving fund, and also accompanied by the written approval of such certificate by the Chief Engineer of the Company.

3. Payments from the relevant Construction and Acquisition Fund account, except payments which the Trustee is authorized to make under the provisions of subsection 2 (and except for payments of costs of issuing the Series and related costs, which shall not require the Certificate of the Chief Engineer specified in clause (c) of this subparagraph 3), shall be made in accordance with the provisions of this subsection. Before any such payment shall be made the Company shall file with the Trustee:

(a) a requisition, signed by an Authorized Officer, stating in respect of each payment to be made:

- (1) the item number of the payment,
- (2) the name of the person, firm or corporation to whom payment is due,
- (3) the amount to be paid, and
- (4) the purpose for which the obligation to be paid was incurred;

(b) a Certificate, signed by an Authorized Officer, certifying:

- (1) that obligations in the stated amounts have been incurred by the Board and that each such obligation is a proper charge against the relevant Construction and Acquisition Fund account and has not been previously paid therefrom,
- (2) that there has not been filed with or served upon the Company notice of any lien, right to lien, attachment upon or claim affecting the right to receive payment of any of the moneys payable to any of the persons, firms or corporations named in such requisition, which has not been released or will not be released simultaneously with the payment of such obligation, and
- (3) that such requisition contains no item representing payment on account of any retained percentage which the Board is at the date of such certificate entitled to retain; and

(c) a Certificate, signed by the Chief Engineer of the Company and attached to such requisition, certifying his approval thereof.

4. The Issuer covenants that, in addition to the foregoing restrictions upon withdrawals or payments from the relevant Construction and Acquisition Fund account, no such withdrawals or payments shall be made for the purchase price or cost of any real property or interest therein, unless the Company will have upon such payment sufficient title, leasehold interest or easement to allow the Company to acquire and construct a Project in accordance with the provisions of this Resolution without adversely affecting the authority of the Company to collect Revenues.

5. The Company further covenants that no part of any Project will be constructed on or under lands other than lands, good

and marketable title to which is under long-term lease or is owned or can be acquired by the Company in fee simple, or over or under which the Company shall have acquired or can acquire valid easements for the purposes of any Project or, other than land, the right to use and occupy which for such purposes shall be vested in the Issuer or the Company by lease or other agreement, law, valid franchises, licenses, easements or rights-of-way.

6. All requisitions, certificates and opinions received by the Trustee, as required in this Article as conditions of payment from the Construction and Acquisition Fund, shall be retained in the possession of the Trustee, subject at all reasonable times to the inspections of the Company, the Consulting Engineers, any bondholder and the agents and representatives thereof.

7. When the acquisition and construction of a Project shall have been completed, which fact shall be evidenced by the filing with the Trustee and with the Company of a Certificate, signed by the Chief Engineer of the Company, stating the Date of Completion and also stating that requisitions have been made for the payment of all obligations which are payable from the relevant Construction and Acquisition Fund account, any balance in the relevant Construction and Acquisition Fund account not reserved for the payment of any remaining part of the Cost of Construction of such Project or the Cost of Construction of any other Project shall be transferred by the Trustee to the credit of the Bond Fund to redeem Bonds of such Series, including payment of current principal and interest.

Section 504. Revenue Fund. The Company covenants that, from and after delivery of the Series 1992 Bonds issued pursuant to Section 205 hereof, all Revenues received by the Company and not required by this Resolution to be deposited elsewhere will be collected by the Company and deposited as received with a Depositary or Depositaries to the credit of the Revenue Fund. All moneys in the Revenue Fund shall be held and applied as hereinafter provided.

Section 505. Bond Fund. 1. Each month, commencing with the initial delivery of the Bonds issued pursuant to Section 205 hereof, the Company shall withdraw from the Revenue Fund and deposit the following amounts with the Trustee and in the following order at the following times:

(a) to the credit of the Bond Service Account, one-sixth (1/6) of the amount necessary to pay interest on all Bonds of each Series then Outstanding on the interest payment date next succeeding, except to the extent that such amount shall be payable from amounts available from other sources; provided, however, that the amount so deposited on account of interest in each month

after the delivery of the Bonds of any such Series up to and including the month immediately preceding the first interest payment date thereafter of the Bonds of such Series shall be that amount which when multiplied by the number of such deposits will be equal to the amount of interest payable on such Bonds on such first interest payment date and that the amount required to be so deposited shall be reduced by any accrued interest paid on such Bonds and any other amount deposited with the Trustee to the credit of the Bond Service Account for the payment of interest;

(b) to the credit of the Bond Service Account, beginning with the twelfth (12th) month preceding the first maturity of any Bonds, one-twelfth (1/12) in the case of annual payments of Principal Installments or one-sixth (1/6) in the case of semiannual payments of Principal Installments of the next Principal Installment of all Bonds of each Series then Outstanding whether by reason of maturity or redemption by operation of Sinking Fund Installments, except to the extent that such amount shall be payable from amounts available from other sources; provided, however, that such amount so deposited on account of Principal Installments in each month after the delivery of the Bonds of any Series up to and including the month immediately preceding the first Principal Installment payment date thereafter of the Bonds of such Series shall be that amount which when multiplied by the number of such deposits will be equal to the amount of the Principal Installment payable on such Bonds on such Principal Installment payment date and that the amount required to be so deposited shall be reduced by any other amount deposited with the Trustee to the credit of the Bond Service Account for the payment of such Principal Installments; and

(c) to the credit of the Reserve Account, such amount as may be required to make the amount then to the credit of the Reserve Account equal to the Bond Reserve Requirement and any requirements relating to the Series 2 Note; provided, however, that (i) the Sale Resolution authorizing the issuance of a Series of Bonds (other than the Series 1992 Bonds authorized by Section 205 hereof) shall provide for payments into the Reserve Account from the proceeds of such Series of Bonds or otherwise or for required monthly payments from the Revenue Fund into the Reserve Account in accordance with a schedule of such payments set forth in such Sale Resolution, or for some combination of the foregoing, such payments to be made in each calendar month after the calendar month in which such Series of Bonds is issued, in such equal amounts and at such times so that, by

no later than five (5) years from the calendar month in which such Series of Bonds was issued, the total amount deposited to the Reserve Account pursuant to such schedule plus the amount deposited to the Reserve Account from the proceeds of such Series of Bonds shall be equal to the difference between the Bond Reserve Requirement immediately prior to the issuance of such Series of Bonds and the Bond Reserve Requirement immediately following the issuance of such Series of Bonds, and (ii) the amount required to be deposited to the credit of the Reserve Account in any calendar month pursuant to this paragraph (c) on account of any increase in the Bond Reserve Requirement resulting from the issuance of any Series of Bonds (other than the Series 1992 Bonds authorized by Section 205 hereof) shall at no time exceed the amount or the sum of the amounts required to be so deposited in such calendar month pursuant to any such schedule or all such schedules.

2. In addition to the payments required by subsection 1 of this Section, the Company shall withdraw from the Revenue Fund and deposit with the Trustee the Principal Installments of and interest on all Bonds of each Series or other obligations (including any obligations described in Section 209 of this Resolution) then Outstanding paying principal and bearing interest payable on dates other than November 15 and May 15 on or prior to the due dates of such Principal Installments and interest.

3. If the amount deposited under the foregoing provisions of this Section in any month to the credit of any Fund or Account under the provisions of subsection 1. of this Section shall be less than the required amount, the requirement therefor shall nevertheless be cumulative and the amount of any deficiency in any month shall be added to the amount otherwise required to be deposited to the credit of said Fund or Account in each month thereafter until such time as such deficiency shall be restored.

4. The Trustee shall, from time to time, withdraw from the Bond Service Account in the Bond Fund and (a) remit by mail to each owner of Bonds the amounts required for paying interest upon such Bonds as such interest becomes due, and (b) set aside or deposit in trust with itself and the appropriate Paying Agents, if any, sufficient moneys for paying the Principal Installments of all Bonds as such Principal Installment becomes due.

5. Moneys held for the credit of the Reserve Account in the Bond Fund shall be used for the purpose of paying interest on or the Principal Installment of the Bonds (including obligations outstanding under Section 206) and the Series 2 Note whenever and to the extent that the moneys held for the credit of the Bond Service Account shall be insufficient for such purpose. If at any time the



amounts held for the credit of the Reserve Account shall exceed the Bond Reserve Requirement, such excess or any portion thereof, shall be transferred by the Trustee, if so directed by an Authorized Officer, to the credit of the Bond Service Account; except that upon payment and discharge of the Series 2 Note and any refundings thereof prior to August 1, 1994, amounts held in the Reserve Account as the Bond Reserve Requirement for the Series 2 Note shall be transferred to the Company.

6. As soon as practicable after the 45th day preceding the due date of any Sinking Fund Installment, the Trustee shall, subject to subsection 7 of this Section, proceed to call for redemption, pursuant to Section 403 hereof on such due date, Term Bonds of the Series and maturity for which such Sinking Fund Installment was established in such amount as shall be necessary to complete the retirement of the principal amount specified for such Sinking Fund Installment of the Term Bonds of such Series and maturity. The Trustee shall so call such Term Bonds for redemption whether or not it then has monies in the Bond Service Account sufficient to pay the applicable principal amount thereof, together with interest thereon to the redemption date. The Trustee shall pay out of the Bond Service Account to itself and the appropriate Paying Agents, if any, on such redemption date, the amount required for the redemption of the Term Bonds so called for redemption, and such amount shall be applied by the Trustee and such Paying Agents to such redemption.

7. The Company may, at any time subsequent to a Principal Installment payment date but in no event less than forty-five (45) days prior to the succeeding Principal Installment payment date on which a Sinking Fund Installment is scheduled to be due, direct the Trustee to purchase, with monies in the Bond Service Account at a price not in excess of par, plus unpaid interest accrued to the date of such purchase, Term Bonds payable from such Sinking Fund Installment and any Term Bonds so purchased prior to a Principal Installment payment date shall be cancelled by the Trustee and evidence of such cancellation shall be given to the Company and the aggregate principal amount of the Term Bonds so purchased shall be credited against the Sinking Fund Installment due on such Principal Installment payment date.

8. After provision shall be made for the payment of all Bonds Outstanding and all expenses and charges herein required to be paid, the Trustee shall pay any balance in the Bond Fund to the Company.

Section 506. Depreciation Fund. 1. Commencing September 1, 1994, each month the Company shall, after making the payments required by Section 505 hereof, withdraw from the Revenue Fund and deposit with a Depositary or Depositaries in the name of the Company, to the credit of the Depreciation Fund, an amount equal



to one-twelfth (1/12) of an amount not less than the annual depreciation charges for the Waterworks System computed by an Authorized Officer of the Company in accordance with recognized and accepted principles of accounting for waterworks.

2. Except as hereinafter provided in this Section, or except in case of an emergency caused by some extraordinary occurrence, so characterized in a Certificate of an Authorized Officer filed with the Trustee, and an insufficiency of moneys to the credit of the Operation Fund to meet such emergency, moneys held for the credit of the Depreciation Fund shall be disbursed only for Capital Expenditures. Payments from the Depreciation Fund, except the withdrawals therefrom which the Issuer is authorized to make as otherwise provided in this Resolution, shall be made only upon orders therefor signed by an Authorized Officer, but before any such payment shall be made, there shall be filed with the Secretary of the Company a requisition therefor, signed by the Chief Engineer of the Company, specifying the payee and the amount and the particular purpose of each payment to be made and certifying that an obligation in each stated amount has been incurred by the Company and that the same is a proper item of Capital Expenditures.

3. If at any time the amount to the credit of the Bond Service Account or the Reserve Account shall be insufficient, in the manner provided herein, for the purpose of paying the interest on or the Principal Installment of the Bonds as such interest and Principal Installment shall become due, then the Company shall withdraw from the Depreciation Fund and deposit with the Trustee to the credit of the Bond Service Account an amount sufficient to make up any such deficiency.

4. To the extent that moneys held for the credit of the Depreciation Fund shall not be required for any of the foregoing purposes, such moneys may at the end of each Bond Year be withdrawn by the Company from the Depreciation Fund and deposited with the Trustee to the credit of the Bond Service Account, if such withdrawal and deposit shall then be lawful.

Section 507. Operation Fund. 1. Each month after the delivery of the Bonds issued pursuant to Section 205 hereof, the Company shall, after making the payments required by Section 505 and 506 hereof, withdraw from the Revenue Fund and deposit with a Depositary or Depositaries, to the credit of the Operation Fund, the balance, if any, remaining in the Revenue Fund.

2. The Current Expenses of the Waterworks System shall be paid by the Company from the Operation Fund as the same become due and payable. Such payments shall be made only after orders therefor

have been signed by an Authorized Officer. After provision has been made for payment of Current Expenses and the dividends provided for in Section 508 hereof, any remaining amount in the Operation Fund may be used by the Company for (i) the payment of Capital Expenditures; (ii) the redemption or purchase of Bonds; or (iii) payment of principal on any indebtedness referred to in Section 609 hereunder. Any remaining amounts as described above in excess of 30% of the Bond Reserve Requirement may be used by the Company for any of its general corporate purposes. Provision for the dividend under the terms of this Section need not include any segregation of amounts in the Operation Fund therefor.

3. The Company covenants that, not less than two months prior to the end of each Fiscal Year, it will prepare and file with the Issuer and the Trustee a preliminary budget of the Company for the ensuing Fiscal Year. Copies of such preliminary budget shall be mailed by the Company to the Consulting Engineers and the City.

4. If the Holders of five per centum (5%) in aggregate principal amount of the Bonds then Outstanding shall so request of the Company in writing on or before the date which is one month prior to the end of the relevant Fiscal Year, the Company shall hold a public hearing on such preliminary budget at which any Bondholder and any other interested person may appear in person or by agency or attorney and present any objections he may have to the final adoption of such budget. Notice of the time and place of any such hearing shall be mailed at least ten (10) days before the hearing to the Trustee, to the Consulting Engineers and to each Bondholder who shall have filed his name and address with the Company for such purpose. The Trustee shall have no duty with respect to such notice of the hearing referred to therein other than to retain such notice as provided in Section 1104 of this Resolution.

5. The Company further covenants that promptly after each such public hearing and on or before the first day of the next Fiscal Year the Issuer will finally adopt the Annual Budget for such Fiscal Year, and that, in the absence of a public hearing on the budget, the Company's total expenditures provided for in the Annual Budget will not exceed the total expenditures set forth in the preliminary budget unless such excess shall be approved by the Consulting Engineers. Copies of the Annual Budget shall be filed with the Trustee and mailed to the Consulting Engineers and the City.

6. If for any reason the Company shall not have adopted the Annual Budget before the first day of any Fiscal Year, the budget for the preceding Fiscal Year shall, until the adoption of the Annual Budget, be deemed to be in force and shall be treated as the Annual Budget under the provisions of this Article.

7. The Company may at any time adopt an amended or supplemental Annual Budget for the remainder of the then current Fiscal Year. Copies of any such amended or supplemental Annual Budget shall be filed with the Trustee and mailed to the Consulting Engineers and the City.

8. The Company covenants that no Current Expenses will be incurred in any Fiscal Year unless the same shall be reasonable and necessary, and that the Issuer and the Company will not expend any amount or incur any indebtedness for Current Expenses in excess of the Annual Budget as the same may be amended or supplemented pursuant to the provisions of this Section.

Section 508. Payment of Dividend. 1. If from time to time during any Fiscal Year there shall have been deposited to the credit of the Bond Service Account, the Reserve Account and the Depreciation Fund all sums then required to be so deposited under the provisions of Sections 505 and 506 herein, then the Board shall, on March 31, June 30, September 30 and December 31 (or, if any such date is not a business day, on the preceding business day) following the issuance of the Series 1992 Bonds, and during each Fiscal Year thereafter, withdraw from the Operation Fund and pay to the Commissioners a dividend on the stock owned by the City in the Louisville Water Company, such payments being in continuation of annual payments heretofore made by the Board to the Commissioners and provided further, that such payments and deposits shall be made only and to the extent that the same shall be lawful, subject only to the provisions of Section 501(2)(iii) of this Resolution, the rights of the Holders of any Bonds Outstanding, and notwithstanding the other provisions contained in this Resolution. For Fiscal Year 1992 and each Fiscal Year thereafter, the total of the quarterly installments of this dividend shall equal sixty per centum (60%) of an amount determined by deducting from the Louisville Water Company's estimated annual Net Income to Retained Earnings for that year, as hereinafter defined, the total of the following: (i) the Principal Installments for that year on all Bonds Outstanding, (ii) deposits made pursuant to subsection 1(c) of Section 505 of this Resolution, (iii) interest earned on the Construction and Acquisition Fund established in subsection 1 of Section 502 and (iv) extraordinary income or expense (such amounts to include any items of extraordinary income or expense attributable to the transfer of real property to the City for nominal consideration pursuant to Section 611 hereof). Such installments shall be as nearly equal in amount as possible. After completion of the annual audit required by Section 610 hereof, the Board shall adjust the preceding Fiscal Year's dividend payments to reflect any difference between estimated and actual Net Income to Retained Earnings, the amount of such adjustment to be spread as equally as may be practical among the current Fiscal Year's dividend payments. Net Income to Retained

Earnings, as used herein, means all Revenue or Revenues, both operating and non-operating (but not including grants in aid of construction, proceeds from the sale of property, or customer contributions), less all expenses, both operating and non-operating, including all accruals to depreciation as defined in this Resolution and including the retirement of undepreciated assets. Except as otherwise provided in this Resolution, the Net Income to Retained Earnings thus determined shall be in accordance with accepted principles of accounting and with the requirements of regulatory agencies, if any.

2. The transfer of real property to the City for nominal consideration pursuant to Section 611 shall not constitute a dividend within the meaning of this Resolution.

Section 509. Open Market Purchases. In addition to its authority to purchase Bonds pursuant to subsection 7 of Section 505, the Issuer or the Company may purchase the Bonds secured hereby and then Outstanding, whether or not such Bonds shall then be subject to redemption, at the most advantageous price obtainable with reasonable diligence, having regard to maturity, option to redeem, coupon rate and price, such price not to exceed the principal of such Bonds plus the amount of the premium, if any, which would be payable on the next redemption date to the Holders of such Bonds under the provisions of this Resolution, if such Bonds should be called for redemption on such date. Upon making each such purchase, an Authorized Officer shall file with the Trustee a statement in writing directing the Trustee to pay the purchase price of the Bonds so purchased upon their delivery and cancellation, which statement shall set forth a description of such Bonds, the purchase price to be paid therefor, the name of the seller and the place of delivery of the Bonds. The Company shall withdraw from the Operation Fund, the Revenue Fund, the Sinking Fund or any Fund or Account permitted by this Resolution and deposit in the Bond Service Account the purchase price of the Bonds to be so purchased, and the Trustee shall purchase such Bonds from the amounts deposited in the Bond Service Account, as directed by an Authorized Officer, but no such purchase shall be made within the period of forty-five (45) days next preceding any interest payment date on which such Bonds are subject to a call for redemption under the provisions of this Resolution. In the event that one or more Term Bonds are purchased pursuant to this Section, there shall be credited against such Sinking Fund Installments for such Term Bonds as the Company shall direct, the principal amount of the Term Bonds so purchased.

Section 510. [Reserved].

Section 511. Unclaimed Funds. All amounts which the Trustee shall have withdrawn from the Bond Fund or shall have

received from any other source and set aside, or deposited with the Paying Agents for the purpose of paying the Bonds either at maturity or otherwise or for the purpose of paying interest when due on the Bonds shall be held in trust for the respective Holders of such Bonds. But any moneys which shall be so set aside or deposited by the Trustee and which shall remain unclaimed by the Holders of such Bonds for a period of six (6) years after the date on which such Bonds shall have become payable shall be paid to the Company or to such officer, board or body as may then be entitled by law to receive the same, and thereafter the Holders of such Bonds shall look only to the Company or to such officer, board or body, as the case may be, for payment and then only to the extent of the amounts so received without any interest thereon, and the Trustee and the Paying Agents shall have no responsibility with respect to such moneys.

Section 512. Rebate Fund; Operation of Rebate Fund. (1) There is hereby created and ordered maintained as a separate account in the custody of Trustee a fund to be designated "Louisville Water Company Water System Revenue Bond Rebate Fund, Series 1992." Any provision hereof to the contrary notwithstanding, amounts credited to the Rebate Fund shall be free and clear of any lien created by this Resolution.

(2) Within 15 days after the end of each Computation Period (but only to the extent that any Excess Earnings have been earned during such period) and within 15 days after the payment in full of all outstanding 1992 Bonds (but only to the extent that any Excess Earnings has been earned during such period), (a) the Company shall cause to be calculated the amount of Cumulative Excess Earnings as of the end of that Computation Period or the date of such payment and shall notify the Trustee in writing of that amount and (b) the Trustee shall notify the Company of the amount then on deposit in the Rebate Fund. In order for the Company to make or cause to be made such computations, the Trustee shall make available to the Company, promptly upon request, the following information: (a) as to interest and principal, the total amount of interest paid on the relevant Series of Bonds, the principal amount of relevant Series of Bonds outstanding during such Computation Period and the amount and date of any payments of principal of the relevant Series of Bonds during such Computation Period; (b) the amount, yield and nature of investments held by the Trustee hereunder as of the end of such Computation Period and the amount and date of the sale of any investments; (c) the total amount of earnings on such investments during such Computation Period; (d) the total amount of earnings on deposit in the Bond Fund, the Sinking Fund and the Rebate Fund; (e) the amount of deposits (including interest earned) to and disbursements from the Rebate Fund; and (f) such other information reasonably available to the Trustee which may be necessary for the

Issuer or the Company to perform or cause to be performed the computations required by Section 148(f) of the Code and Treasury Regulations thereunder.

(3) If, on any such Computation Date, the amount then on deposit in the Rebate Fund is in excess of the Cumulative Excess Earnings, the Trustee, at the written direction of the Company, shall forthwith pay that excess amount to the Company. If, on any such Computation Date, the amount then on deposit in the Rebate Fund is less than the Cumulative Excess Earnings, the Company shall, within 5 days after receipt of the aforesaid notice from the Trustee, pay to the Trustee for deposit in the Rebate Fund an amount sufficient to cause the Rebate Fund to contain an amount equal to the Cumulative Excess Earnings. Within 30 days after each Computation Period, the Trustee, at the direction of the Company, shall pay to the United States in accordance with Section 148(f) of the Code from the moneys then on deposit in the Rebate Fund an amount equal to 90% (or such greater percentage not in excess of 100% as the Company may direct the Trustee to pay) of the Cumulative Excess Earnings. Within 30 days after the payment in full of all outstanding relevant Series of Bonds, the Trustee, at the written direction of the Company, shall pay to the United States in accordance with Section 148(f) of the Code from the moneys then on deposit in the Rebate Fund an amount equal to 100% of the Cumulative Excess Earnings as of the date of such payment and any moneys remaining in the Rebate Fund following such payment shall be paid to the Issuer.

(4) The Trustee, with the advice, assistance and cooperation of the Company, shall keep such records of the computations made pursuant to this Section as are required under Section 148(f) of the Code.

(5) The Trustee may rely exclusively and conclusively on a certificate of the Company or advice of counsel provided to the Trustee by the Company with respect to compliance with the aforesaid requirements. If any action is necessary to be taken by the Trustee in connection with compliance, such certificate or advice shall specifically advise the Trustee as to what action needs to be taken and the Trustee agrees to take said action. The responsibility of the Trustee shall be solely to comply with such certification or advice of counsel and the Trustee shall have no liability for any determination of taxability or other adverse consequence resulting from any action taken pursuant hereto or thereto.

(6) Each payment of an installment of Excess Earnings required to be paid to the United States of America shall be paid to and filed with the Internal Revenue Service Center, Philadelphia, Pennsylvania 19255. Each such payment shall be accompanied by a copy of Form 8038-T (Arbitrage Rebate) filed with respect to the Bonds. Notwithstanding the foregoing, disbursements of amounts in

the Rebate Fund to the United States of America shall at all times be made in amounts and at the times determined pursuant to applicable Code and Treasury Regulation requirements.

(7) The Company and the Trustee need not comply with the provisions of this Section 512 if and to the extent that they receive a Counsel's opinion that such failure to comply will not affect adversely the exclusion of interest on the Series 1992 Bonds from gross income for federal income tax purposes.

Section 513. Deposit and Security of Moneys. 1. All amounts received by the Company under the provisions of this Resolution shall be deposited with the Trustee or one or more Depositaries and shall be held in trust and applied only in accordance with the provisions of this Resolution and except as may be provided herein shall not be subject to any lien or attachment by any creditor of the Issuer, the City or of the Company. All amounts deposited with each Depositary, including the Trustee, shall be credited to the particular Fund or Account to which such amounts belong.

2. No moneys shall be deposited with any Depositary, other than the Trustee, in an amount exceeding fifty per centum (50%) of the amount which an officer of such Depositary shall certify to the Issuer as the combined capital and surplus of such Depositary.

3. All moneys deposited with the Trustee or any other Depositary hereunder shall either be insured or be continuously secured, for the benefit of the Company and the holders of the Bonds, either (a) by lodging with a bank or trust company approved by the Trustee as custodian, as collateral security, Government Obligations, or other marketable securities eligible as security for the deposit of trust funds under regulations of the Board of Governors of the Federal Reserve System, having a market value (exclusive of accrued interest) not less than the amount of such deposit, or (b) as to all or any part of such deposit, by lodging with the Trustee, or with the Treasurer of the Board in the case of moneys deposited or remaining on deposit with the Trustee, the indemnifying bond or bonds of a surety company or companies qualified as surety for United States Government deposits and qualified to transact business in the state in which such Depositary is located in a penal sum not less than the amount of moneys so deposited or such part thereof, such bond or bonds to be approved in writing by the Treasurer of the Company or (c) in such other manner as may then be required or permitted by applicable state or federal laws and regulations regarding the security for, or granting a preference in the case of, the deposit of trust funds; provided, however, that it shall not be necessary for the Trustee or the

Paying Agents to give security for the deposit of any moneys with them for the payment of the Principal Installment of, or the Redemption Price or the interest on any Bonds issued hereunder, or for the Trustee to give security for any moneys which shall be represented by obligations under the provisions of this Article as an investment of such moneys.

Section 514. Investment of Funds and Accounts. 1. Moneys held for the credit of the Construction and Acquisition Fund and the Bond Service Account shall, as nearly as may be practicable, be continuously invested and reinvested by the Trustee in Investment Securities as directed by an Authorized Officer which shall mature, or which shall be subject to redemption or other disposition by the holder thereof at the option of such holder, not later than the respective dates, as estimated by an Authorized Officer, when moneys held for the credit of such Fund or Account will be required for the purposes intended.

2. Moneys held for the credit of the Reserve Account in the Bond Fund shall be continuously invested and reinvested by the Trustee in Investment Securities as directed by an Authorized Officer.

3. Moneys held for the credit of the Depreciation Fund, Revenue Fund and the Operation Fund may be invested by an Authorized Officer in Investment Securities.

4. Obligations so purchased as an investment of moneys in any such Fund or Account shall be deemed at all times to be a part of such Fund or Account, and the interest accruing thereon and profit realized from such investment shall be credited to such Fund or Account, except as otherwise provided, and any loss resulting from such investment shall be charged to such Fund or Account. The Trustee or an Authorized Officer, as the case may be, shall sell at the best price obtainable or present for redemption any obligations so purchased whenever it shall be necessary so to do in order to provide moneys to meet any payment or transfer from any such Fund or Account. Neither the Trustee nor an Authorized Officer shall be liable or responsible for any loss resulting from any such investment.

5. In computing the amount in any Fund or Account held under the provisions of this Resolution, excepting the Reserve Account, obligations purchased as an investment of monies therein shall be valued at par plus accrued interest. In computing the amount of the Reserve Account, obligations purchased as an investment of monies therein shall be valued at par if purchased at par or at Amortized Value if purchased at other than par. Amortized Value, when used with respect to an obligation purchased at a



premium above or a discount below par, means the obligation purchased at a value as of any given date obtained by dividing the total amount of the premium or discount at which such obligation was purchased by the number of days remaining to maturity on such obligation at the time of such purchase and by multiplying the amount so calculated by the number of days having passed since the date of such purchase; and in the case of an obligation purchased at a premium, by deducting the product thus obtained from the purchase price, and in the case of an obligation purchased at a discount, by adding the product thus obtained to the purchase price. Valuation on any particular date shall include the amount of interest then earned or accrued to such date on any monies or investments in the Reserve Account.

## ARTICLE VI

### SPECIFIC COVENANTS

Section 601. Payment of Bonds. Neither the Issuer nor the Company is in violation of any provisions of any laws of the Commonwealth relevant to the transactions contemplated hereby or in connection with the issuance of the Series 1992 Bonds. The Issuer has full and complete legal power and authority to execute and deliver this Resolution and to issue and deliver the Series 1992 Bonds, and has by proper corporate action, acting in accordance with the Act, duly authorized the execution and delivery of this Resolution and the Series 1992 Bonds. Subject to the provisions of this Resolution, particularly Section 501(2)(iii) of this Resolution, the Issuer covenants that the Company shall duly and punctually pay or cause to be paid the principal or Redemption Price, if any, of every Bond and the interest thereon, at the dates and places and in the manner mentioned therein, according to the true intent and meaning thereof, and shall duly and punctually satisfy all Sinking Fund Installments, if any, which may be established for any Series of Bonds.

Section 602. Extension of Payment of Bonds. The Issuer shall not directly or indirectly extend or assent to the extension of the maturity of any of the Bonds or the time of payment of any of the claims for interest by the purchase or funding of such Bonds or claims for interest or by any other arrangement and in case the maturity of any of the Bonds or the time for payment of any such claims for interest shall be extended, such Bonds or claims for interest shall not be entitled in case of any default under this Resolution to the benefit of this Resolution or to any payment out of any assets of the Company or the funds (except funds held in trust for the payment of particular Bonds or claims for interest pursuant to this Resolution) held by the Fiduciaries, except subject to the prior payment of the principal of all Bonds issued and

outstanding the maturity of which has not been extended and of such portion of the accrued interest on the Bonds as shall not be represented by such extended claims for interest. Nothing herein shall be deemed to limit the right of the Issuer to issue Refunding Bonds as provided in Section 204 and Section 205 and such issuance shall not be deemed to constitute an extension of maturity of any Bond or Bonds.

Section 603. Rate Covenant. 1. The Issuer covenants that the present schedule of rates and charges for water service furnished by the Company, both within and without the territorial limits of the City, including the service charges, minimum deposits, connection charges and meter rates, and the rules and regulations of the Issuer and the Company will not be revised so as to result in a decrease of Revenues, except as hereinafter provided. Except as now required by State law, there shall be no new free services (other than fire protection) rendered by the Waterworks System and all customers (other than those who, on the date of adoption of this Resolution, receive free service) receiving water from the Company shall pay therefor at the established rates.

2. The Issuer covenants that the water rates and charges referred to in subsection 1 of this Section will not be reduced nor any discount greater than the discount now in effect allowed thereon for the prompt payment thereof unless:

(a) all deposits shall have been made to the credit of the Bond Fund which are required by Article V to have been made prior to the time of such reduction of rates or increases of such discount; and

(b) the Net Revenues for the preceding Fiscal Year shall have been not less than one hundred and thirty per centum (130%) of the maximum Aggregate Bond Service for each Bond Fiscal Year in respect of all Outstanding Bonds of the Company.

3. The Issuer further covenants that, from time to time and as often as it shall be necessary, the water rates and charges will be adjusted as may be necessary or proper so that Net Revenues in each Fiscal Year will be not less than one hundred and thirty per centum (130%) of the maximum Aggregate Bond Service for each Bond Fiscal Year in respect of all then Outstanding Bonds. Forthwith upon the adoption of any revision of such water rates and charges the Issuer will cause certified copies thereof to be filed with the Trustee.

Section 604. Covenants as to Projects. 1. The Company covenants that upon the issuance of Bonds for a Project or Projects,

it will forthwith proceed to construct such Project or Projects in conformity with law and all requirements of all governmental authorities having jurisdiction therefor.

2. The Company further covenants and agrees that it will require each person, firm or corporation with whom it may contract for construction to furnish a performance bond in the full amount of any contract in excess of \$250,000, adjusted from time to time to reflect inflation, and to carry such workmen's compensation or employer's liability insurance as may be required by law and such public liability, property damage and builders' risk insurance, if any, as may be deemed necessary. The Company further covenants and agrees that In the event of any default under any such contract the proceeds of any such performance bond will forthwith, upon receipts of such proceeds, be applied toward the completion of the contract in connection with which such performance bond shall have been furnished.

3. The Company further covenants and agrees that, unless otherwise required by law, each such contract for construction will also provide that payments thereunder shall not be made by the Issuer in excess of ninety per centum (90%) of current estimates approved by the Chief Engineer of the Company, except payment of the final balance due under any such contract.

Section 605. Rules and Regulations. The Issuer and the Company further covenant that reasonable rules and regulations governing the use of the Waterworks System and the operation thereof will be established and enforced, that all compensation, salaries, fees and wages paid by the Company in connection with the maintenance, repair and operation of the Waterworks System will be reasonable, that no greater number of persons will be employed than is necessary, that the Waterworks System will be maintained and operated by the Company in an efficient and economical manner and in good repair and sound operating conditions, that all necessary repairs, renewals and replacements will be made, and that the Company will comply with all valid acts, rules, regulations, orders and directions of any legislative, executive, administrative or judicial body applicable to the Waterworks System.

Section 606. Liens and Encumbrances. The Company further covenants that, from the Revenues, all taxes and assessments or other municipal or governmental charges lawfully levied or assessed upon the Waterworks System or upon any part thereof or upon any Revenues therefrom will be paid when the same shall become due, that all valid requirements of any municipal or governmental authority relative to the Waterworks System will be duly observed and complied with, that neither the Issuer nor the Company will create or suffer to be created any lien or charge upon the Waterworks System or any

part thereof or upon the Revenues therefrom ranking equally with or prior to the Bonds, subject to the provisions of Section 501(2)(iii) of this Resolution, and that, from the Revenues, there will be paid or caused to be discharged, or adequate provision will be made to satisfy and discharge, within sixty (60) days after the same shall accrue all lawful claims and demands for labor, materials, supplies or other objects which, if unpaid, might by law become a lien upon the Waterworks System or any part thereof or upon the Revenues therefrom; provided, however that nothing in this Section shall require the Company or the Issuer to pay or cause to be discharged, or make provision for, any such lien or charge so long as the validity thereof shall be contested in good faith and by appropriate legal proceedings. This Section shall not be construed as prohibiting the issuance of parity Bonds under the provisions of this Resolution.

Section 607. Consulting Engineers. The Company covenants and agrees that there will be employed for the purpose of performing and carrying out the duties imposed on the Consulting Engineers by this Resolution, an independent engineer or engineering firm or corporation having a nationwide and favorable reputation for skill and experience in such work. The cost of employing Consulting Engineers as provided in this Resolution shall be treated either as a Cost of Construction of a Project or Projects or as a Current Expense, at the discretion of the Company.

Section 608. Insurance. 1. The Company covenants that the Company will insure and at all times keep insured, in a responsible insurance company or companies authorized and qualified under the laws of the Commonwealth of Kentucky to assume the risks thereof, all buildings and all machinery and equipment thereon against such loss or damage as the Consulting Engineer shall from time to time approve as appropriate and customary for similar properties as similarly situated.

2. The amounts of such insurance in each case shall be subject to the approval of the Consulting Engineers, and the insurer therein shall be subject to the approval of the Trustee. All such policies shall be for the benefit of the Issuer and the Trustee as their interests shall appear and shall be deposited with the Trustee.

3. The proceeds of all insurance referred to in this Section shall be available for and shall, to the extent necessary and in the opinion of the Consulting Engineer desirable, be applied to the repair, replacement or reconstruction of the damaged or destroyed property.

4. All insurance policies shall be open to the inspection of the Bondholders and their representatives at all reasonable

times. Any appraisal or adjustment of any loss or damage and any settlement or payment of indemnity therefor which may, with the approval of the Consulting Engineers be agreed upon between the Company and any insurer, shall be evidenced to the Trustee by a Certificate signed by an Authorized Officer, which Certificate may be assented to and accepted by the Trustee and may be relied upon by the Trustee as conclusive. The Trustee shall in no way be liable or responsible for the collection of insurance moneys in case of any loss or damage.

5. Notwithstanding any provisions herein to the contrary, the Company may enter into a plan of self-insurance in order to provide the insurance required herein, subject to the approval of the Trustee.

Section 609. Covenant as to Additional Bond Resolutions and Permitted Indebtedness. 1. The Issuer and the Company covenant and agree that none of the Revenues of the Company will be used for any purpose other than as provided in this Resolution, and that no contract or contracts will be entered into or any action taken by which the rights of the Trustee or of the Bondholders might be impaired or diminished. The Issuer and the Company further covenant that such resolutions and such rules and regulations will be adopted as may be necessary or appropriate to carry out the obligations of the Issuer and the Company under the provisions of this Resolution and the applicable laws of the Commonwealth of Kentucky. The Issuer and the Company further covenants that neither will issue any Bonds or Notes hereunder unless it receives (i) the Certificates required by Section 203(4) or (ii) in the case of Refunding Bonds, either the Certificates required by paragraph 5 of Section 204(2) or the Certificates required by Section 204(3) and that the information contained in such Certificates is true and accurate in all respects. This Section shall not be construed as prohibiting the issuance of parity Bonds under the provisions of this Resolution.

2. Nothing contained in this Resolution shall prevent the Issuer or the Company from issuing bonds, notes, or any other obligations for the Company under another and separate resolution so long as the charge or lien created by such resolution is not prior or equal to the charge or lien created by this Resolution.

Section 610. Covenants as to Accounts and Audits. 1. The Company covenants that the funds and accounts of the Waterworks System will be kept separate from all other funds and accounts and that accurate records and accounts will be kept of all items of cost and of all expenditures relating to the Waterworks System and of the Revenues collected and the application of such Revenues. Such records and accounts shall be open to the inspection of the Trustee and any Bondholder.

2. The Company further covenants that at least once each month it will cause to be filed with the Trustee and mailed to the Consulting Engineers copies of any revisions of the water rates and charges during the preceding calendar month and a report setting forth in respect of the preceding calendar month:

(a) in reasonable detail, the Revenues of the Waterworks System and the Current Expenses (i) for such month, (ii) for the same month of the preceding Fiscal Year, (iii) for all months of the current Fiscal Year including such month, and (iv) for the same months of the preceding Fiscal Year;

(b) a statement of the number and classification of the users of the Waterworks System;

(c) a balance sheet as of the end of such month;

(d) the amounts on deposit at the end of such month to the credit of each Fund and Account; and

(e) the amounts of the proceeds received from any sales of property pursuant to the provisions of Section 611 of this Article.

3. The Issuer further covenants that in the first quarter of each Fiscal Year it will cause an audit to be made of the books and accounts of the Company including the Waterworks System by an independent firm of certified public accountants of suitable experience and responsibility to be chosen by the Issuer with the approval of the Trustee, and will cause an annual report of operations of the Company to be prepared, such annual report to cover the matters usually contained in annual reports for similar systems. Within a reasonable time thereafter reports of each audit and copies of each annual report shall be filed with the Director of Finance of the City, the Issuer, the Commissioners and the Trustee, and copies of such reports shall be mailed to the Consulting Engineers and each Bondholder who shall have filed his name and address with the Board for such purpose. Each such audit report shall set forth in respect of the preceding Fiscal Year the same matters as are hereinabove required for the monthly reports, and also the findings of such certified public accountants as to whether the moneys received by the Company under this Resolution have been applied in accordance with the provisions of this Resolution and whether the Issuer is in default in the performance of any of the covenants contained in Section 603 of this Resolution. Such monthly reports and audit reports shall be open to the inspection of all interested persons.

4. The Issuer further covenants that it will cause any additional reports or audits relating to the Waterworks System to be

made as required by law and that, as often as may be requested, such other information concerning the Company or the operation thereof will be furnished to the Trustee and to the Holder of any Bonds as any of them may reasonably request. The cost of such audits shall be treated as a Current Expense.

Section 611. Sale or Lease of Properties. The Company covenants that except as in this Resolution otherwise permitted, it will not sell, lease or otherwise dispose of or encumber the Waterworks System or any part thereof. The Company may, however, from time to time, sell any machinery, fixtures, apparatus, tools, instruments, or other movable property acquired by the Company in connection with the Waterworks System, or any materials used in connection therewith, if the Company shall determine that such articles are no longer needed or are no longer useful in connection with the operation or maintenance of the Waterworks System, and the proceeds thereof shall be applied to the replacement of the properties so sold or disposed of or shall be deposited to the credit of the Depreciation Fund. The Company may from time to time sell or lease such other real property forming part of the Waterworks System which it may determine is not needed or serves no useful purpose in connection with the maintenance and operation of the Waterworks System, if the Consulting Engineers shall in writing approve such sale or lease; the proceeds of any such sale to be disposed of as hereinabove provided for the proceeds of the sale or disposal of movable property. The rents of any lease as described above shall be treated as Revenues of the Waterworks System. Nothing herein shall prevent the Company from transferring for nominal consideration real property that is not needed or is no longer useful in connection with the operation or maintenance of the Waterworks System to the City for the exclusive use and enjoyment of the City, including, without limitation, the Crescent Hill Golf Course. Any portion of the Waterworks System consisting of real estate being used as administrative offices may be transferred, at the discretion of the Issuer, to the City for nominal consideration.

Section 612. Report as to Condition of System. 1. The Company covenants to prepare and file with the Issuer, the Trustee and the City, not less than two months prior to the end of each Fiscal Year, a report, accompanied by the comments of the Consulting Engineers thereon, setting forth the following:

(a) advice and recommendations as to the proper maintenance, repair and operation of the Waterworks System during the ensuing Fiscal Year, and an estimate of the amount of money necessary for such purposes;

(b) advice and recommendations as to the extensions, improvements, renewals and replacements which should be made during the ensuing Fiscal Year, and an estimate of the amount of money necessary for such purposes;

(c) advice and recommendations as to the insurance to be carried under the provisions of Section 608 of this Resolution; and

(d) recommendations as to any necessary or advisable revisions of the water rates and charges.

2. The Company covenants that it shall cause the Consulting Engineers to make an inspection of the Waterworks System at least once in each Fiscal Year and to prepare and file with the Trustee and the City, on or before the date which is two months prior to the end of the Fiscal Year, a report setting forth their findings as to whether the properties of the Waterworks System have been maintained in good repair and sound operating condition, and their estimate of the amount, if any, required to be expended to place the Waterworks System in such condition and the details of such expenditures and the approximate time required therefor.

3. Copies of each such report shall be mailed to each Bondholder who shall have filed his name and address with the Board for such purpose.

4. The Company covenants that if any such report of the Consulting Engineers shall set forth that the properties of the Waterworks System have not been maintained in good repair and sound operating condition, it will promptly restore the System to good repair and sound operating condition with all expedition practicable and that adequate provision will be made therefor in the Annual Budget.

#### Section 613. [Reserved]

Section 614. Covenant as to Prior Lien Bonds. The Issuer covenants that upon the adoption of this Resolution it will not thereafter authorize, issue or deliver any Prior Lien Bonds or other obligations under the Prior Lien Bond Ordinances except for Prior Lien Bonds in lieu of or in substitution for other Prior Lien Bonds pursuant to the provisions for interchangeability or conversion contained in the Prior Lien Bond Ordinances. The Issuer also covenants that it will comply with the covenants and agreements contained in the Prior Lien Bond Ordinances, which may be effective from time to time until the Prior Lien Bond Ordinance containing



such covenants or agreements has been discharged, except that no dividend shall be paid in excess of the dividend permitted by Section 508 of this Resolution.

Section 615. No Additional Dividends. Other than as provided in Section 508 of this Resolution, the Issuer covenants that it shall not pay any dividends to the Commissioners or the City. Any transfer of real property to the City for nominal consideration pursuant to Section 611 hereof shall not constitute a dividend within the meaning of this Section.

Section 616. No Amendment of General Resolution. The Board covenants that it will not modify or amend this Resolution of the Board adopted on July 14, 1992, in any way which would affect the Issuer's undertakings in this Resolution to comply with the provisions of all of its covenants and agreements relating to the Waterworks System.

Section 617. Further Assurance. At any and all times the Issuer shall, so far as it may be authorized by law, pass, make, do, execute, acknowledge and deliver, all and every such further resolutions, acts, deeds, conveyances, assignments, transfers and assurances as may be necessary or desirable for the better assuring, conveying, granting, assigning and confirming all and singular the rights, revenues and other moneys, securities and funds hereby pledged or assigned, or intended so to be, or which the Issuer may become bound to pledge or assign after the date of adoption of this Resolution.

Section 618. Covenant as to Continued Corporate Existence. The Issuer and the Company covenant that neither will take any action to terminate its corporate existence.

Section 619. Certain Representations, Warranties and Covenants. The Issuer hereby covenants, represents and warrants to each Holder of a Bond issued pursuant to authority of this Resolution (except taxable bonds), as follows:

- (1) No Series of Bonds will be federally guaranteed within the meaning of Section 149(b) of the Code;
- (2) the Issuer will comply with the information reporting requirements of Section 149(e) of the Code in respect of each Series of Bonds;

(3) the Issuer and the Company shall each at all times do and perform all acts and things permitted by law and necessary or desirable in order to assure that interest paid by the Issuer and the Company on each Series of Bonds shall, for the purposes of federal income taxation, be excludable from gross income;

(4) within the meaning of Section 141 of the Code, (i) less than 10% of the proceeds of each Series of Bonds, if any, will be applied for any private business use, and the payment of principal of or interest on less than 10% of the amount of each Series of Bonds, if any, will be secured directly or indirectly by any interest in property used for a private business use, or payments in respect of such property, or will be derived from payments in respect of such property; (ii) at least 90% of the proceeds of each Series of Bonds will be applied for a governmental use of the Issuer; (iii) any private business use of any Project financed by a Series of Bonds will be related to such governmental use of the Issuer and will not be unrelated or disproportionate; and (iv) none of the proceeds of a Series of Bonds will be used, directly or indirectly, to make or finance loans to private persons;

(5) amounts on deposit in the Bond Service Account of the Bond Fund will be used within thirteen (13) months from the date of deposit for the payment of debt service on the Outstanding Bonds; and the Bond Service Account of the Bond Fund will annually be depleted through such application, for current debt service requirements of the Outstanding Bonds, except for an amount equal to not more than the greater of (a) one-twelfth (1/12th) of debt service requirements of the Outstanding Bonds for the then ensuing year or (b) one year's earnings on the Bond Service Account of the Bond Fund;

(6) amounts accumulated in the Depreciation Fund and Operation Fund have never been and are not reasonably expected to be used for payment of debt service on any Outstanding Bonds, even though such Depreciation Fund and Operation Fund will be so available if necessary to prevent a default in the payment of principal and interest on any Series of Bonds; and

(7) neither the Issuer nor the Company has been advised of any listing or contemplated listing by the Internal Revenue Service determining that any certification with respect to its obligations may not be relied on.

Prior to or at the time of delivery of a Series of Bonds, any Authorized Officer who is charged with the responsibility for

the issuance of Series of Bonds, is hereby authorized and directed to execute an appropriate certification with reference to any matters referred to above, and any other relevant facts, setting out all known and contemplated facts, in order to assure that interest on each Series of Bonds will be excludable from gross income for Federal income tax purposes and that none of such Bonds will be deemed to be arbitrage bonds.

## ARTICLE VII

### CONCERNING THE TRUSTEE AND THE PAYING AGENTS

Section 701. Trustee: Appointment and Acceptance of Duties. The Trustee shall signify its acceptance of the duties and obligation imposed upon it by this Resolution by executing the certificate of authentication endorsed upon the Bonds, and, by executing such certificate upon any Bond, the Trustee shall be deemed to have accepted such duties and obligations not only with respect to the Bond so authenticated, but with respect to all the Bonds thereafter to be issued, but only, however, upon the terms and conditions set forth in this Resolution.

Section 702. Paying Agents: Appointment and Acceptance of Duties. 1. The Issuer, in the Bond Resolution or the Sale Resolution may appoint one or more Paying Agents for the Bonds of any Series, and the Issuer may at any time or from time to time appoint one or more other Paying Agents in the manner and subject to the conditions set forth.

2. Each Paying Agent shall signify its acceptance of the duties and obligations imposed upon it by this Resolution by executing and delivering to the Issuer and to the Trustee a written acceptance thereof.

3. The principal corporate trust offices of the Paying Agents, if any, in addition to the principal corporate trust office of the Trustee, are designated as the respective offices or agencies of the Issuer for the payment of the principal or Redemption Price of the Bonds.

Section 703. Responsibilities of Fiduciaries. The recitals of fact in this Resolution and contained in the Bonds shall be taken as the statements of the Issuer and the Company, as applicable, and no Fiduciary assumes any responsibility for the correctness of the same. No Fiduciary makes any representations as to the validity or sufficiency of this Resolution or of any Bonds issued thereunder or in respect of the security afforded by this Resolution, and no Fiduciary shall incur any liability in respect thereof. The Trustee shall, however, be responsible for its representations, contained in its certificate on the Bonds. No Fiduciary shall be under any

responsibility or duty with respect to the issuance of the Bonds for value or the application of the proceeds thereof or the application of any moneys paid to the Issuer or for any losses incurred upon the sale or redemption of any securities purchased for or held in any Fund or Account under this Resolution. No Fiduciary shall be under any responsibility or duty with respect to the application of any moneys paid to any other Fiduciary. The Trustee shall be under no responsibility or duty with respect to the application of any moneys placed on time deposit, at the direction of the Issuer, with any other Depositary. No Fiduciary shall be liable in connection with the performance of its duties under this Resolution except for its own misconduct, negligence, bad faith or default.

Section 704. Evidence on Which Fiduciaries May Act. 1. Each Fiduciary shall be protected in acting upon any notice, resolution, request, consent, order, certificate, report, opinion, bond, or other paper or document believed by it to be genuine, and to have been signed or presented by the proper party or parties. Each Fiduciary may consult with counsel, who may or may not be of counsel to the Issuer, and the opinion of such counsel shall be full and complete authorization and protection in respect of any action taken or suffered by such Fiduciary under this Resolution in good faith and in accordance therewith.

2. Whenever any Fiduciary shall deem it necessary or desirable that a matter be proved or established prior to taking or suffering any action under this Resolution, such matter (unless other evidence in respect thereof be therein specifically prescribed) may be deemed to be conclusively proved and established by a Certificate of an Authorized Officer, and such Certificate shall be full warrant for any action taken or suffered in good faith under the provisions of this Resolution upon the faith thereof; but in its discretion the Fiduciary may in lieu thereof accept other evidence of such fact or matter or may require such further or additional evidence as to it may seem reasonable.

3. Except as otherwise expressly provided in this Resolution, any request, order, notice or other direction required or permitted to be furnished pursuant to any provision thereof by the Issuer to any Fiduciary shall be sufficiently executed if executed in the name of the Board by an Authorized Officer or an authorized officer of the Issuer.

Section 705. Compensation. The Company shall pay to each Fiduciary from time to time reasonable compensation for all services rendered under this Resolution, and also all reasonable expenses, charges, counsel fees and other disbursements, including those of its attorneys, agents and employees, incurred in and about the performance of their powers and duties under this Resolution. The

Company further agrees to indemnify and save each Fiduciary harmless against any liabilities which it may incur in the exercise and performance of its powers and duties hereunder and which are not due to its misconduct, negligence or bad faith. Payment of a Fiduciary shall be considered either as part of the Cost of Construction of a Project of Projects or as a Current Expense at the discretion of the Board.

Section 706. Certain Permitted Acts. Any Fiduciary may become the owner of any Bonds or any other obligations of the Company, with the same rights it would have if it were not a Fiduciary. To the extent permitted by law, any Fiduciary may act as depository for, and permit any of its officers or directors to act as a member of, or in any other capacity with respect to, any committee formed to protect the rights of Bondholders or the holders of any other obligations of the Company or to the effect or aid in any reorganization growing out of the enforcement of the Bonds or any other obligations of the Company or this Resolution, whether or not any such committee shall represent the Holders of a majority in principal amount of the Bonds then Outstanding.

Section 707. Resignation of Trustee. The Trustee may at any time resign and be discharged of the duties and obligations created by this Resolution by giving not less than 60 days' written notice to the Issuer and mailing notice thereof, specifying the date when such resignation shall take effect, to the registered owners of the Bonds, and such resignation shall take effect upon the day specified in such notice unless previously a successor shall have been appointed by the Issuer or the Bondholders as provided in Section 709, in which event such resignation shall take effect immediately on the appointment of such successor.

Section 708. Removal of Trustee. The Trustee may be removed at any time by an instrument or concurrent instruments in writing, filed with the Trustee, and signed by the Holders of a majority in principal amount of the Bonds then Outstanding or their attorneys-in-fact duly authorized, excluding any Bonds held by or for the account of the Issuer.

Section 709. Appointment of Successor Trustee. 1. In case at any time the Trustee shall resign or shall be removed or shall become incapable of acting, or shall file a petition for relief under federal bankruptcy laws, if applicable, or become insolvent, or if a receiver, liquidator or conservator of the Trustee, or its property, shall be appointed, or if any public officer shall take charge or control of the Trustee, or of its property or affairs, a successor may be appointed by the Holders of a majority in principal amount of the Bonds then Outstanding, excluding any Bonds held by or

for the account of the Issuer, by an instrument or concurrent instruments in writing signed and acknowledged by such Bondholders or by their attorneys-in-fact duly authorized and delivered to such successor Trustee, notification thereof being given to the Issuer, and the predecessor Trustee; provided, nevertheless, that unless a successor Trustee shall have been appointed by the Bondholders as aforesaid, the Issuer by a duly executed written instrument signed by an authorized officer of the Issuer shall forthwith appoint a Trustee to fill such vacancy until a successor Trustee shall be appointed by the Bondholders as authorized in this Section 709. The Issuer shall cause to be mailed notice of any such appointment made by it to the registered owners of the Bonds no later than 20 days after such appointment. Any successor Trustee appointed by the Issuer shall, immediately and without further act, be superseded by a Trustee appointed by the Bondholders.

2. If in a proper case no appointment of a successor Trustee shall be made pursuant to the foregoing provisions of this Section within 45 days after the Trustee shall have given to the Issuer written notice as provided in Section 707 or after a vacancy in the office of the Trustee shall have occurred by reason of its inability to act, the Trustee or the Holder of any Bond may apply to any court of competent jurisdiction to appoint a successor Trustee. Said court may thereupon, after such notice, if any, as such court may deem proper and prescribe, appoint a successor Trustee.

3. Any Trustee appointed under the provisions of this Section 709 in succession to the Trustee shall be a bank or trust company organized under the laws of any state or a national banking association, and having a capital and surplus aggregating at least \$25,000,000, if there be such a bank or trust company or national banking association willing and able to accept the office on reasonable and customary terms and authorized by law to perform all the duties imposed upon it by this Resolution.

Section 710. Transfer of Rights and Property to Successor Trustee. Any successor Trustee appointed under this Resolution shall execute, acknowledge and deliver to its predecessor Trustee, and also to the Issuer, an instrument accepting such appointment, and thereupon such successor Trustee, without any further act, deed or conveyance, shall become fully vested with all moneys, estates, properties, rights, powers, duties and obligations of such predecessor Trustee, with like effect as if originally named as Trustee; but the Trustee ceasing to act shall nevertheless, on the written request of the Issuer, or of the successor Trustee, execute, acknowledge and deliver such instruments of conveyance and further assurance and do such other things as may reasonably be required for

more fully and certainly vesting and confirming in such successor Trustee all the rights, title and interest of the predecessor Trustee in and to any property held by it under this Resolution, and shall pay over, assign and deliver to the successor Trustee any money or other property subject to the trusts and conditions herein set forth. Should any deed, conveyance or instrument in writing from the Company be required by such successor Trustee for more fully and certainly vesting in and confirming to such successor Trustee any such estates, rights, power and duties, any and all such deeds, conveyances and instruments in writing shall, on request, and so far as may be authorized by law, be executed, acknowledged and delivered by the Company. Any such successor Trustee shall promptly notify the Paying Agents, if any, of its appointment as Trustee.

Section 711. Merger or Consolidation. Any company into which any Fiduciary may be merged or converted or with which it may be consolidated or any company resulting from any merger, conversion or consolidation to which it shall be a party or any company to which any Fiduciary may sell or transfer all or substantially all of its corporate trust business, provided such company shall be a bank or trust company organized under the laws of any state of the United States or a national banking association and, in the case of any successor Trustee, shall meet the requirements of paragraph 3 of Section 709, in the case of a successor Paying Agent, shall meet the requirements of paragraph 1 of Section 713, and shall be authorized by law to perform all the duties imposed upon it by this Resolution, shall be the successor to such Fiduciary without the execution or filing of any paper or the performance of any further act.

Section 712. Adoption of Authentication. In case any of the Bonds contemplated to be issued under this Resolution shall have been authenticated but not delivered, any successor Trustee may adopt the certificate of authentication of any predecessor Trustee so authenticating such Bonds and deliver such Bonds so authenticated; and in case any of the said Bonds shall not have been authenticated, any successor Trustee may authenticate such Bonds in the name of the predecessor Trustee, or in the name of the successor Trustee, and in all such cases such certificate shall have the full force which it is anywhere in said Bonds or in this Resolution provided that the certificate of the Trustee shall have.

Section 713. Resignation or Removal of Paying Agent and Appointment of Successor. 1. Any Paying Agent may at any time resign and be discharged of the duties and obligations created by this Resolution by giving at least 60 days' written notice to the Issuer, the Trustee, and the other Paying Agents. Any Paying Agent may be removed at any time by an instrument filed with such Paying Agent and the Trustee and signed by the Issuer. Any successor Paying Agent shall be appointed by the Issuer, with the approval of

the Trustee, and (subject to the requirements of Section 702) shall be a bank or trust company organized under the laws of any state of the United States or a national banking association, having a capital and surplus aggregating at least \$10,000,000 and willing and able to accept the office on reasonable and customary terms and authorized by law to perform all the duties imposed upon it by this Resolution.

2. In the event of the resignation or removal of any Paying Agent, such Paying Agent shall pay over, assign and deliver any moneys held by it as Paying Agent to its successor, or if there be no successor, to the Trustee. In the event that for any reason there shall be a vacancy in the office of any Paying Agent, the Trustee shall act as such Paying Agent.

## ARTICLE VIII

### SUPPLEMENTAL RESOLUTIONS

Section 801. Supplemental Resolutions Effective Upon Filing with the Trustee. For any one or more of the following purposes and at any time or from time to time, a Supplemental Resolution may be adopted, which, upon the filing with the Trustee of a copy thereof certified by the Secretary of the Issuer or, if adopted prior to the appointment of a Trustee pursuant to Section 701, upon its adoption, shall be fully effective in accordance with its terms:

- (1) To close the Resolution against, or provide limitations and restrictions in addition to the limitations and restrictions contained in this Resolution on, the authentication and delivery on original issuance of Bonds or the issuance of other evidences of indebtedness;
- (2) To add to the covenants and agreements of, or limitations and restrictions on, the Company or the Issuer in this Resolution other covenants and agreements to be observed by the Company or the Issuer which are not contrary to or inconsistent with this Resolution as theretofore in effect;
- (3) To add to the limitations and restrictions in this Resolution other limitations and restrictions to be observed by the Company or the Issuer which are not contrary to or inconsistent with the Resolution as theretofore in effect;
- (4) To surrender any right, power or privilege reserved to or conferred upon the Company or the Issuer by this Resolution;



(5) To confirm, as further assurance, any pledge under, and the subjection to any lien or pledge created or to be created by, this Resolution, of the Revenues, or of any other moneys, securities or funds; or

(6) To modify any of the provisions of this Resolution in any other respect whatever, provided that (i) such modification shall be, and be expressed to be, effective only after all Bonds of any Series Outstanding at the date of the adoption of such Supplemental Resolution shall cease to be Outstanding and (ii) such Supplemental Resolution shall be specifically referred to in the text of all Bonds of any Series authenticated and delivered on original issuance after the date of the adoption of such Supplemental Resolution and of Bonds issued in exchange therefor or in place thereof; or

(7) To modify any of the provisions of this Resolution in any other respect whatever, provided that such modification does not materially adversely affect the rights of the Holders of the Bonds;

(8) To make provisions with respect to the issuance, execution, delivery, authentication, payment, registration, transfer and exchange of Bonds in coupon form payable to bearer, provided that (except in respect of taxable obligations) obligations of the Issuer may then be issued in coupon form with interest thereon excludable from federal income taxes.

Section 802. Supplemental Resolution Effective Upon Consent of Trustee. For any one or more of the following purposes and at any time or from time to time, a Supplemental Resolution may be adopted, which, upon (i) the filing with the Trustee of a copy thereof certified by the Secretary of the Issuer and (ii) the filing with the Trustee and the Issuer of an instrument in writing made by the Trustee consenting thereto, shall be fully effective in accordance with its terms:

(1) To cure any ambiguity, supply any omission, or cure or correct any defect or inconsistent provision in this Resolution; or

(2) To insert such provisions clarifying matters or questions arising under this Resolution as are necessary or desirable and are not contrary to or inconsistent with this Resolution as theretofore in effect.

Section 803. Supplemental Resolutions Effective with Consent of Bondholders. At any time or from time to time, a

Supplemental Resolution may be adopted subject to consent by Bondholders in accordance with and subject to the provisions of Article IX, which Supplemental Resolution upon the filing with the Trustee of a copy thereof certified by the Secretary of the Board and upon compliance with the provisions of said Article IX, shall become fully effective in accordance with its terms as provided in said Article IX.

Section 804. General Provisions. 1. This Resolution shall not be modified or amended in any respect except as provided in and in accordance with and subject to the provisions of this Article VIII and Article IX. Nothing contained in this Article VIII or Article IX shall affect or limit the right or obligation of the Issuer to adopt, make, do, execute, acknowledge or deliver any resolution, act or other instrument pursuant to the provisions of Section 617 or the right or obligation of the Issuer to execute and deliver to any Fiduciary any instrument which elsewhere in this Resolution it is provided shall be delivered to said Fiduciary.

2. Any Supplemental Resolution referred to and permitted or authorized by Sections 801 and 802 may be adopted by the Issuer without the consent of any of the Bondholders, but shall become effective only on the conditions, to the extent and at the time provided in said Sections, respectively. The copy of every Supplemental Resolution when filed with the Trustee shall be accompanied by a Counsel's Opinion stating that such Supplemental Resolution has been duly and lawfully adopted in accordance with the provisions of this Resolution, is authorized or permitted by this Resolution, and is valid and binding upon the Issuer and enforceable in accordance with its terms.

3. The Trustee is hereby authorized to accept the delivery of a certified copy of any Supplemental Resolution referred to and permitted or authorized by Sections 801, 802 or 803 and to make all further agreements and stipulations which may be therein contained, and the Trustee, in taking such action, shall be fully protected in relying on an opinion of counsel (which may be a Counsel's Opinion) that such Supplemental Resolution is authorized or permitted by the provisions of this Resolution.

4. No Supplemental Resolution shall change or modify any of the rights or obligations of any Fiduciary without its written assent thereto.

## ARTICLE IX

### AMENDMENTS

Section 901. Mailing. Any provision in this Article for the mailing of a notice or other paper to Bondholders shall be fully complied with if it is mailed postage prepaid only to each registered owner of Bonds then Outstanding at his address, if any, appearing upon the registry books of the Issuer and to the Trustee.

Section 902. Powers of Amendment. Any modification or amendment of this Resolution and of the rights and obligations of the Company or the Issuer and of the Holders of the Bonds, in any particular, may be made by a Supplemental Resolution of the Issuer, with the written consent given as provided in Section 903, (i) of the Holders of at least sixty percent (60%) in principal amount of the Bonds Outstanding at the time such consent is given, and (ii) in case less than all of the several Series of Bonds then Outstanding are affected by the modification or amendment, of the Holders of at least sixty percent (60%) in principal amount of the Bonds of each Series so affected and Outstanding at the time such consent is given; provided, however, that if such modification or amendment will, by its terms, not take effect so long as any Bonds of any specified like Series and maturity remain Outstanding, the consent of the Holders of Bonds of such like series shall not be required and Bonds of such like Series shall not be deemed to be Outstanding for the purpose of any calculation of Outstanding Bonds under this Section. No such modification or amendment shall permit a change in the terms of redemption or maturity of the principal of any Outstanding Bond or of any installment of interest thereon or a reduction in the Principal Installment or the Redemption Price thereof or in the rate of interest thereon without the consent of the Holder of such Bond or shall reduce the percentages or otherwise affect the classes of Bonds the consent of the Holders of which is required to effect any such modification or amendment, or shall change or modify any of the rights or obligations of any Fiduciary without the written assent thereto of any party so affected or referred to above. For the purposes of this Section, a Series shall be deemed to be affected by a modification or amendment of this Resolution if the same adversely affects or diminishes the rights of the Holders of Bonds of such Series. The Trustee may in its discretion determine whether or not in accordance with the foregoing powers of amendment Bonds of any particular Series or maturity would be affected by any modification or amendment of this Resolution and any such determination shall be binding and conclusive on the Issuer and all Holders of Bonds.

Section 903. Consent of Bondholders. The Issuer may at any time adopt a Supplemental Resolution making a modification or amendment permitted by the provisions of Section 902, to take effect

when and as provided in this Section. A copy of such Supplemental Resolution (or brief summary thereof or reference thereto in form approved by the Trustee) together with a request to Bondholders for their consent thereto in form satisfactory to the Trustee, shall be mailed by the Issuer to the Holders of the Bonds. Such Supplemental Resolution shall not be effective unless and until (a) there shall have been filed with the Trustee (i) the written consents of Holders of the percentages of Outstanding Bonds specified in Section 902 and (ii) a Counsel's Opinion stating that such Supplemental Resolution has been duly and lawfully adopted and filed by the Issuer in accordance with the provisions of this Resolution, is authorized or permitted by this Resolution, and is valid and binding upon the Issuer and enforceable in accordance with its terms, and (b) a notice shall have been mailed as hereinafter in this Section 903 provided. Each such consent shall be effective only if accompanied by proof of the holding, at the date of such consent, of the Bonds with respect to which such consent is given, which proof shall be such as is permitted by Section 1102. A Certificate or Certificates by the Trustee filed with the Trustee that it has examined such proof and that such proof is sufficient in accordance with Section 1102 shall be conclusive that the consents have been given by the Holders of the Bonds described in such Certificate or Certificates of the Trustee. Any such consent shall be binding upon the Holders of the Bonds giving such consent and, anything in Section 1102 to the contrary notwithstanding, upon any subsequent Holder of such Bonds and of any Bonds issued in exchange therefor (whether or not such subsequent Holder thereof has notice thereof), unless such consent is revoked in writing by the Holder of such Bonds giving such consent or subsequent Holder thereof by filing such revocation with the Trustee prior to the time when the written statement of the Trustee hereinafter in this Section 903 provided for is filed. The fact that a consent has not been revoked may likewise be proved by a Certificate of the Trustee filed with the Trustee to the effect that no revocation thereof is on file with the Trustee. At any time after the Holders of the required percentages of Bonds shall have filed their consents to the Supplemental Resolution, the Trustee shall make and file with the Issuer and the Trustee a written statement that the Holders of such required percentages of Bonds have filed such consents. Such written statement shall be conclusive that such consents have been so filed. At any time thereafter notice, stating in substance that the Supplemental Resolution (which may be referred to as a Supplemental Resolution adopted by the Issuer on a stated date, a copy of which is on file with the Trustee) has been consented to by the Holders of the required percentages of Bonds and will be effective as provided in this Section 903, may be given to Bondholders by the Issuer by mailing such notice to Bondholders (but failure to mail such notice shall not prevent such Supplemental Resolution from becoming effective and binding as in this Section 903 provided) not more than

90 days after the Holders of the required percentages of Bonds shall have filed their consents to the Supplemental Resolution and the written statement of the Trustee hereinabove provided for is filed. The Issuer shall file with the Trustee proof of the mailing of such notice to Bondholders. A record, consisting of the papers required or permitted by this Section 903 to be filed with the Trustee, shall be proof of the matters therein stated. Such Supplemental Resolution making such amendment or modification shall be deemed conclusively binding upon the Issuer and the Company, the Fiduciaries and the Holders of all Bonds at the expiration of 40 days after the filing with the Trustee of the proof of the mailing of such last mentioned notice, except in the event of a final decree of a court of competent jurisdiction setting aside such Supplemental Resolution in a legal action or equitable proceeding for such purpose commenced within such 40-day period; provided, however, that any Fiduciary and the Issuer during such 40-day period and any such further period during which any such action or proceeding may be pending shall be entitled in their absolute discretion to take such action, or to refrain from taking such action, with respect to such Supplemental Resolution as they may deem expedient.

Section 904. Modifications by Unanimous Consent. The terms and provisions of this Resolution and the rights and obligations of the Issuer and the Company and of the Holders of the Bonds hereunder may be modified or amended in any respect upon the adoption and filing by the Issuer of a Supplemental Resolution and the consent of the Holders of all of the Bonds then Outstanding, such consent to be given as provided in Section 903 except that no notice to Bondholders shall be required; provided, however, that no such modification or amendment shall change or modify any of the rights or obligations of any Fiduciary without the filing with the Trustee of the written assent thereto of such Fiduciary in addition to the consent of the Bondholders.

Section 905. Exclusion of Bonds. Bonds owned or held by or for the account of the Issuer or the Company shall not be deemed Outstanding for the purpose of consent or other action or any calculation of Outstanding Bonds provided for in this Article, and the Issuer shall not be entitled with respect to such Bonds to give any consent or take any other action provided for in this Article. At the time of any consent or other action taken under this Article, the Issuer shall furnish the Trustee with a Certificate of the Secretary of the Issuer upon which the Trustee may rely describing all Bonds so to be excluded.

Section 906. Notation on Bonds. Bonds authenticated and delivered after the effective date of any action taken as in Article VIII or this Article provided may, and, if the Trustee so determines shall, bear a notation by endorsement or otherwise in form approved

by the Issuer and the Trustee as to such action, and in that case upon demand of the Holder of any Bond Outstanding at such effective date and presentation of his Bond for the purpose at the principal office of the Trustee suitable notation shall be made on such Bond by the Trustee as to any such action. If the Issuer or the Trustee shall so determine, new Bonds so modified as in the opinion of the Trustee and the Issuer to conform to such action shall be prepared, authenticated and delivered, and upon demand of the Holder of any Bond then Outstanding shall be exchanged, without cost to such Bondholder, for Bonds of the same Series and maturity then Outstanding, upon surrender of such Bonds.

## ARTICLE X

### REMEDIES ON DEFAULT

Section 1001. Events of Default. If one or more of the following events (in the Resolution called "Events of Default") shall happen, that is to say:

(i) if there is a failure to make due and punctual payment of the principal of, or Redemption Price or any Sinking Fund Installment, of any Bond when and as the same shall become due and payable, whether at maturity or by call for redemption, or otherwise,

(ii) if there is a failure to make due and punctual payment of any installment of interest on any Bond, when and as such interest installment shall become due and payable, and such default shall continue for a period of 30 days,

(iii) if the Issuer or the Company shall fail to perform or observe any of the other covenants, agreements or conditions on its part in this Resolution or in the Bonds contained, and such default shall continue for a period of 60 days after written notice thereof to the Issuer by the Trustee or to the Issuer and to the Trustee by the Holders of a majority in principal amount of the Bonds Outstanding,

(iv) if the Issuer or the Company shall file a petition for relief under the federal bankruptcy laws, or under any other applicable law or statute of the United States of America or of the State of Kentucky, or

(v) if there is a failure to make due and punctual payment of the principal or any redemption price of, or of any installment of interest on, any of the Prior Lien Bonds when and as the same shall become due and payable,

then, and in each and every such case, so long as such Event of Default shall not have been remedied, unless the principal of all the Bonds shall have already become due and payable, either the Trustee (by notice in writing to the Issuer), or the Holders of twenty-five percent (25%) in principal amount of the Bonds Outstanding (by notice in writing to the Issuer and the Trustee), may declare the principal of all the Bonds then Outstanding, and the interest accrued thereon, to be due and payable immediately, and upon any such declaration the same shall become and be immediately due and payable, anything in this Resolution or in any of the Bonds contained to the contrary notwithstanding. The right of the Trustee or of the Holders of twenty-five percent (25%) in principal amount of the Bonds to make any such declaration as aforesaid, however, is subject to the condition that if, at any time after such declaration, but before the Bonds shall have matured by their terms, all overdue installments of interest and Principal Installments upon the Bonds, together with the reasonable and proper charges, expenses and liabilities of the Trustee, and all other sums then payable by the Issuer or the Board under this Resolution (except the principal of, and interest accrued since the next preceding interest date on, the Bonds due and payable solely by virtue of such declaration) shall either be paid by or for the account of the Issuer or the Board or provision satisfactory to the Trustee shall be made for such payment, and all defaults under the Bonds or under this Resolution (other than the payment of principal and interest due and payable solely by reason of such declaration) shall be made good or be secured to the satisfaction of the Trustee or provision deemed by the Trustee to be adequate shall be made therefor, then and in every such case the Holders of a majority in principal amount of the Bonds Outstanding, by written notice to the Issuer and the Company and to the Trustee, may rescind such declaration and annul such default in its entirety, or, if the Trustee shall have acted without a direction from the Holders of a majority in principal amount of the Bonds Outstanding at the time of such request, and if there shall not have been theretofore delivered to the Trustee written direction to the contrary by the Holders of a majority in principal amount of the Bonds then Outstanding, then any such declaration shall ipso facto be deemed to be rescinded and any such default and its consequences shall ipso facto be deemed to be annulled, but no such rescission and annulment shall extend to or affect any subsequent default or impair or exhaust any right or power consequent thereon.

Section 1002. Accounting and Examination of Records After Default. 1. The Issuer covenants that if an Event of Default shall have happened and shall not have been remedied, the books of record and account of the Company relating to the Waterworks System and all other records relating to the Waterworks System shall at all times be subject to the inspection and use of the Trustee and of its agents and attorneys, including the Consulting Engineers.

2. The Issuer covenants that if an Event of Default shall happen and shall not have been remedied, the Issuer and the Company, upon demand of the Trustee, will account, as if it were the trustee of an express trust, for all Revenues and other moneys, securities and funds pledged or held under this Resolution for such period as shall be stated in such demand.

Section 1003. Application of Revenues and Other Moneys After Default. 1. The Issuer covenants that if an Event of Default shall happen and shall not have been remedied, the Issuer, upon demand of the Trustee, shall pay over or cause to be paid over to the Trustee (i) forthwith, all moneys, securities and funds then held by the Issuer, the Company, or a Depositary in any fund or account under this Resolution, and (ii) as promptly as practicable after receipt thereof, and subject to the provisions of Section 501(2)(iii) of this Resolution, the Revenues.

2. During the continuance of an Event of Default, the Trustee shall apply such moneys, securities, funds and Revenues and the income therefrom as follows and in the following order:

(i) to the payment of the reasonable and proper charges and expenses of the Trustee and of the Consulting Engineers;

(ii) to the payment of the amounts required for reasonable and necessary Current Expenses, including reasonable and necessary reserves and working capital therefor, and for the reasonable repair and replacement of the Projects or Waterworks System, necessary to prevent loss of Revenues, as certified to the Trustee by the Consulting Engineers. For this purpose the books of record and account of the Issuer and the Company relating to the Projects shall at all times be subject to the inspection of Consulting Engineers during the continuance of such Event of Default;

(iii) to the payment of the interest and principal or Redemption Price then due on the Bonds, subject to the provisions of Section 602, as follows:

(a) unless the principal of all of the Bonds shall have become or have been declared due and payable,

First: To the payment to the persons entitled thereto of all installments of interest then due in the order of the maturity of such installments, and, if the amount available shall not be sufficient to pay in full any installment or installments maturing on the same date, then to the payment thereof ratably, according to the amounts due thereon, to the persons



entitled thereto, without any discrimination or preference; and

Second: To the payment to the persons entitled thereto of the unpaid principal or Redemption Price of any Bonds which shall have become due, whether at maturity or by call for redemption, in the order of their due dates, and, if the amount available shall not be sufficient to pay in full all the Bonds due on any date, then to the payment thereof ratably, according to the amounts of principal or Redemption Price due on such date, to the persons entitled thereto, without any discrimination or preference.

(b) if the principal of all of the Bonds shall have become or have been declared due and payable, to the payment of the principal and interest then due and unpaid upon the Bonds without preference or priority of principal over interest or of interest over principal, or of any installment of interest over any other installment of interest, or of any Bond over any other Bond, ratably, according to the amounts due respectively for principal and interest, to the persons entitled thereto without any discrimination or preference.

3. If and whenever all overdue installments of interest on all Bonds, together with the reasonable and proper charges and expenses of the Trustee, and all other sums payable by the Issuer or the Company under this Resolution, including the principal or Redemption Price of and accrued unpaid interest on all Bonds which shall then be payable by declaration or otherwise, shall either be paid by or for the account of the Issuer or the Company, or provision satisfactory to the Trustee shall be made for such payment, and all defaults under this Resolution or the Bonds shall be made good or secured to the satisfaction of the Trustee or provision deemed by the Trustee to be adequate shall be made therefor, the Trustee shall pay over to the Company all such Revenues then remaining unexpended in the hands of the Trustee (except Revenues deposited or pledged, or required by the terms of this Resolution to be deposited or pledged, with the Trustee), and thereupon the Issuer, the Company and the Trustee shall be restored, respectively, to their former positions and rights under this Resolution, and all Revenues shall thereafter be applied as provided in Article V. No such payment over to the Company by the Trustee or resumption of the application of Revenues as provided in Article V shall extend to or affect any subsequent default under this Resolution or impair any right consequent thereon.

Section 1004. Proceedings Brought by the Trustee. 1. If an Event of Default shall happen and shall not have been remedied,

then and in every such case, the Trustee, by its agents and attorneys, if the Trustee shall deem it advisable, may proceed to protect and enforce its rights and the rights of the Holders of the Bonds under this Resolution forthwith by a suit or suits in equity or at law, whether for the specific performance of any covenant herein contained, or in aid of the execution of any power herein granted, or for an accounting against the Issuer or the Company as if the Issuer or the Company were the trustee of an express trust, or in the enforcement of any other legal or equitable right as the Trustee, being advised by counsel, shall deem most effectual to enforce any of its rights or to perform any of its duties under this Resolution.

2. All rights of action under this Resolution may be enforced by the Trustee without the possession of any of the Bonds or the production thereof on the trial or other proceedings, and any such suit or proceedings instituted by the Trustee shall be brought in its name.

3. The Holders of a majority in principal amount of the Bonds at the time Outstanding, may direct by instrument in writing the time, method and place of conducting any proceeding for any remedy available to the Trustee, or exercising any trust or power conferred upon the Trustee, provided that the Trustee shall have the right to decline to follow any such direction if the Trustee shall be advised by counsel that the action or proceeding so directed may not lawfully be taken, or if the Trustee in good faith shall determine that the action or proceeding so directed would involve the Trustee in personal liability or be unjustly prejudicial to the Bondholders not parties to such direction.

4. Upon commencing a suit in equity or upon other commencement of judicial proceedings by the Trustee to enforce any right under this Resolution, the Trustee shall be entitled to exercise any and all rights and powers conferred in this Resolution and provided to be exercised by the Trustee upon the occurrence of an Event of Default; and, as a matter of right against the Issuer, without notice or demand and without regard to the adequacy of the security for the Bonds, the Trustee shall, to the extent permitted by law, be entitled to the appointment of a receiver of the moneys, securities and funds then held by the Issuer in any Fund or Account under this Resolution and, subject to the provisions of Section 501(2)(iii) of this Resolution, of the Revenues, with all such powers as the court or courts making such appointment shall confer; but notwithstanding the appointment of any receiver, the Trustee shall be entitled to retain possession and control of and to collect and receive income from, any moneys, securities and funds deposited or pledged with it under this Resolution or agreed or provided to be delivered to or deposited or pledged with it under this Resolution.

5. Regardless of the happening of an Event of Default, the Trustee shall have power to, but unless requested in writing by the Holders of a majority in principal amount of the Bonds then Outstanding, and furnished with reasonable security and indemnity, shall be under no obligation to, institute and maintain such suits and proceedings as it may be advised shall be necessary or expedient to prevent any impairment of the security under this Resolution by any acts which may be unlawful or in violation of this Resolution, and such suits and proceedings as the Trustee may be advised shall be necessary or expedient to preserve or protect its interests and the interests of the Bondholders.

Section 1005. Restriction on Bondholders' Action. 1. No Holder of any Bond shall have any right to institute any suit, action or proceeding at law or in equity for the enforcement of any provision of this Resolution or the execution of any trust under this Resolution or for any remedy under this Resolution, unless such Holder shall have previously given to the Trustee written notice of the happening of an Event of Default, as provided in this Article, and the Holders of at least twenty-five percent (25%) in principal amount of the Bonds then Outstanding shall have filed a written request with the Trustee, and shall have offered it reasonable opportunity, either to exercise the powers granted in this Section or to institute such action, suit or proceeding in its own name, and unless such Holders shall have offered to the Trustee adequate security and indemnity against the costs, expenses and liabilities to be incurred therein or thereby, and the Trustee shall have refused to comply with such request within a reasonable time; it being understood and intended that no one or more Holders of Bonds shall have any right in any manner whatever by his or their action to affect, disturb or prejudice the pledge created by this Resolution, or to enforce any right under this Resolution, except in the manner therein provided; and that all proceedings at law or in equity to enforce any provision of this Resolution shall be instituted, had and maintained in the manner provided in this Resolution and for the equal benefit of all Holders of the Outstanding Bonds, subject only to the provisions of Section 602.

2. Nothing in the Resolution or in the Bonds contained shall affect or impair the obligation of the Issuer, which is absolute and unconditional, to pay at the respective dates of maturity and places therein expressed the principal of and interest on the Bonds to the respective Holders thereof, or affect or impair the right of action, which is also absolute and unconditional, of any Holder to enforce such payment of his Bond.

Section 1006. Remedies Not Exclusive. No remedy by the terms of this Resolution conferred upon or reserved to the Trustee or the Bondholders is intended to be exclusive of any other remedy,

but each and every such remedy shall be cumulative and shall be in addition to every other remedy given under this Resolution or existing at law or in equity or by statute on or after the date of adoption of this Resolution.

Section 1007. Effect of Waiver and Other Circumstances.

1. No delay or omission of the Trustee or of any Bondholder to exercise any right or power arising upon the happening of an Event of Default shall impair any right or power or shall be construed to be a waiver of any such default or to be an acquiescence therein; and every power and remedy given by this Article to the Trustee or to the Bondholders may be exercised from time to time and as often as may be deemed expedient by the Trustee or by the Bondholders.

2. Prior to the declaration of maturity of the Bonds as provided in Section 1001, the Holders of a majority in principal amount of the Bonds at the time Outstanding, or their attorneys-in-fact duly authorized, may on behalf of the Holders of all of the Bonds waive any past default under this Resolution and its consequences, except a default in the payment of interest on or principal of or premium on any of the Bonds. No such waiver shall extend to any subsequent or other default or impair any right consequent thereon.

ARTICLE XI

MISCELLANEOUS

Section 1101. Defeasance. 1. If the Issuer shall pay or cause to be paid to the Holders of all Bonds then Outstanding, the principal and interest and Redemption Price, if any, to become due thereon, at the times and in the manner stipulated therein and in this Resolution, then, at the option of the Issuer, expressed in an instrument in writing signed by an Authorized Officer and delivered to the Trustee, the lien of the pledge established by Section 501 hereof, the covenants, agreements and other obligations of the Issuer and the Company to the Bondholders shall be discharged and satisfied. In such event, the Trustee shall, upon the request of the Issuer, execute and deliver to the Issuer and the Company all such instruments as may be desirable to evidence such discharge and satisfaction and the Fiduciaries shall pay over or deliver to the Company all money, securities and funds held by them pursuant to this Resolution which are not required for the payment or redemption of Bonds not theretofore surrendered for such payment or redemption.

2. Bonds or interest installments for the payment or redemption of which moneys shall have been set aside and shall be held in trust by one or more Fiduciaries (through deposit by the

Issuer of funds for such payment or redemption or otherwise) at the maturity or redemption date thereof shall be deemed to have been paid within the meaning and with the effect expressed in paragraph 1 of this Section. One or more Outstanding Bonds of any Series shall, prior to the maturity or redemption date thereof, be deemed to have been paid within the meaning and with the effect expressed in paragraph 1 of this Section if (a) in case any of said Bonds are to be redeemed on any date prior to their maturity, the Issuer shall have given to the Trustee in form satisfactory to it irrevocable instructions to mail as provided in Article IV of this Resolution notice of redemption of such Bonds, it being permissible, notwithstanding anything in Article IV to the contrary, for such instructions to state that Bonds are to be redeemed during a certain period only upon the happening of a subsequent event, (b) there shall have been deposited with the Trustee (x) moneys in an amount which shall be sufficient, or (y) Government Obligations or (z) obligations (A) validly issued by or on behalf of a state or political subdivision thereof, (B) fully secured by a first lien on Government Obligations, the principal of and the interest on which when due will provide moneys which, together with the moneys, if any, deposited with the Trustee at the same time, shall be sufficient, to pay when due the principal or Redemption Price, if applicable, and interest due and to become due on said Bonds on and prior to the redemption date or maturity date thereof, as the case may be, and (c) in the event said Bonds are not by their terms subject to redemption within the next succeeding 60 days, the Issuer shall have given the Trustee in form satisfactory to it irrevocable instructions to mail, as soon as practicable, a notice to the Holders of such Bonds that the deposit required by (b) above has been made with the Trustee and that said Bonds are deemed to have been paid in accordance with this Section and stating such maturity or redemption date upon which moneys are to be available for the payment of the principal or Redemption Price, if applicable, on said Bonds or stating, if such dates are not then known, that a notice of any redemption date shall be subsequently mailed, no later than 30 days prior to the date of redemption as provided by Article IV of this Resolution.

3. To the extent required for the payment of the principal or Redemption Price, if applicable, and interest on said Bonds, and except as provided in this paragraph 3, neither moneys deposited with the Trustee pursuant to this Section nor principal or interest payments on any Government Obligations or obligations secured thereby deposited with the Trustee pursuant to this Section shall be withdrawn or used for any purpose other than, but shall be held in trust for, the payment of the principal or Redemption Price, if applicable, and interest on said Bonds. Notwithstanding the foregoing, in the case of the escrow or trust fund obligations identified in (y) and (z) of paragraph 2 of this Section 1101 (the "Escrow Securities"), such Escrow Securities may be sold, transferred or otherwise disposed of, and the escrow or trust fund

may be restructured, invested and reinvested, but only in Escrow Securities and only at the request of and as directed by the Issuer, as supported by a Counsel's Opinion to the effect that such transaction, including any release of excess moneys described in the next sentence, shall not (i) affect adversely the exclusion from federal income tax of interest on the relevant Bonds (if the Bonds which are the subject of such escrow or trust fund are Bonds the interest on which is excludable from gross income for federal income tax purposes), or (ii) affect adversely the status of the relevant Bonds as being deemed no longer outstanding under this Resolution. Prior to any such sale, transfer or other disposition of the Escrow Securities held in the applicable escrow or trust fund, the Trustee and any relevant Escrow Agent shall each receive a certified public accountants' report to the effect that any new Escrow Securities are sufficient to provide for the payment required pursuant to this Section 1101 of the Resolution. To the extent that such sale, transfer or other disposition results in excess moneys which are no longer required to make payments at the times and in the amounts sufficient to pay when due the principal amount of, and accrued interest on, the relevant Bonds and/or the Redemption Price and interest to become due on the Bonds to be refunded on and prior to the maturity or redemption dates thereof, as the case may be, such excess moneys shall, at the request of the Issuer, be released to the Issuer as its absolute property and free from the lien and trust of this Resolution and any such escrow or trust.

4. In the event that the Company shall purchase Bonds on the open market for which moneys have been set aside pursuant to subsection 2 of this Section, monies which thereby are no longer required for payment of such Bonds shall, at the direction of the Issuer, be paid by the Fiduciary to the Trustee for deposit in the Revenue Fund.

Section 1102. Evidence of Signatures of Bondholders and Ownership of Bonds. 1. Any request, consent, revocation of consent or other instrument which this Resolution may require or permit to be signed and executed by the Bondholders may be in one or more instruments of similar tenor, and shall be signed or executed by such Bondholders in person or by their attorneys-in-fact appointed in writing. Proof of (i) the execution of any such instrument, or of an instrument appointing any such attorney, or (ii) the holding by any person of the Bonds, shall be sufficient for any purpose of this Resolution (except as otherwise herein expressly provided) if made in the following manner, or in any other manner satisfactory to the Trustee, which may nevertheless in its discretion require further or other proof in cases where it deems the same desirable:

(1) The fact and date of the execution by any Bondholder or his attorney-in-fact of such instrument may be proved by the certificate, which need not be acknowledged or verified, of an officer of a bank or trust company or of any notary public or other officer authorized to take acknowledgments of deeds, that the person signing such request or other instrument acknowledged to him the execution thereof, or by an affidavit of a witness of such execution, duly sworn to before such notary public or other officer. Where such execution is by an officer of a corporation or association or a member of a partnership, on behalf of such corporation, association or partnership such certificate or affidavit shall also constitute sufficient proof of his authority;

(2) The ownership of Bonds and the principal amount, numbers and other identification, and date of owning the same shall be proved by the registry books.

2. Any request or consent by the owner of any Bond shall bind all future owners of such Bond in respect of anything done or suffered to be done by the Issuer or any Fiduciary in accordance therewith.

Section 1103. Moneys Held for Particular Bonds. The amounts held by any Fiduciary for the payment of the interest, principal or Redemption Price due on any date with respect to particular Bonds shall, on and after such date and pending such payment, be set aside on its books and held in trust by it for the Holders of the Bonds entitled thereto.

Section 1104. Preservation and Inspection of Documents. All documents received by any Fiduciary under the provisions of this Resolution shall be retained in its possession and shall be subject at all reasonable times to the inspection of the Issuer, any other Fiduciary, and any Bondholder and their agents and their representatives, any of whom may make copies thereof.

Section 1105. Parties Interested Herein. Nothing in this Resolution expressed or implied is intended or shall be construed to confer upon, or to give to, any person or corporation, other than the Issuer, the Fiduciaries, and the Holders of the Bonds, any right, remedy or claim under or by reason of this Resolution or any covenant, condition or stipulation thereof; and all the covenants, stipulations, promises and agreements in this Resolution contained by and on behalf of the Issuer shall be for the sole and exclusive benefit of the Issuer, the Company, the Fiduciaries, and the Holders of the Bonds.

Section 1106. No Recourse on the Bonds. No recourse shall be had for the payment of the principal of or interest on the Bonds or for any claim based thereon or on this Resolution against any member or officer of the Issuer or the Company or any person executing the Bonds.

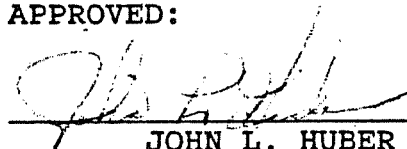
Section 1107. Successors and Assigns. Whenever in this Resolution the Issuer, the Company or the Board is named or referred to, it shall be deemed to include its successors and assigns and all the covenants and agreements in the Resolution contained by or on behalf of the Issuer or the Company shall bind and inure to the benefit of its successors and assigns whether so expressed or not.

Section 1108. Severability of Invalid Provisions. If any one or more of the covenants or agreements provided in this Resolution on the part of the Issuer or any Fiduciary to be performed should be contrary to law, then such covenant or covenants, agreement or agreements, shall be deemed severable from the remaining covenants and agreements, and shall in no way affect the validity of the other provisions of this Resolution.

Section 1109. Effective Date. This Resolution shall take effect from and after its adoption and upon the filing with the Trustee of a copy hereof certified by an Authorized Offer.


ADOPTED BY THE BOARD OF WATER WORKS AS THE GOVERNING BODY OF THE LOUISVILLE WATER COMPANY AT A DULY CONVENED MEETING HELD ON JULY 14, 1992.

APPROVED:

  
\_\_\_\_\_  
JOHN L. HUBER  
President

(SEAL)

ATTEST:

  
\_\_\_\_\_  
ROBERT K. MILLER  
Acting Secretary

CERTIFICATION

I, the undersigned, the duly appointed and qualified Acting Secretary of the Louisville Water Company, do hereby certify that



the foregoing Resolution is a true, accurate and complete copy of that certain Resolution duly adopted by the Board of Water Works as the governing body of said Company at a duly convened meeting of said Board of Waterworks held on July 14, 1992, of the same occasion signed in open session by the President, attested under seal by me as Secretary, and declared to be in full force and effect.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed the seal of the Louisville Water Company this 19th day of August, 1992.



ROBERT K. MILLER  
Acting Secretary

(SEAL)

ENDORSEMENT OF TRUSTEE

FIRST NATIONAL BANK OF LOUISVILLE, Louisville, Kentucky, Trustee in respect of the above-identified Resolution, hereby acknowledges the filing by the Board of Water Works of the City of Louisville, Kentucky and Louisville Water Company with the Trustee of a duly executed and certified copy of the above Resolution, consents to such filing and accepts the duties of Trustee thereunder, and will hold and maintain such Resolution in its corporate records as an integral record of the Board of Water Works of the City of Louisville, Kentucky and Louisville Water Company effective as of August 19, 1992.

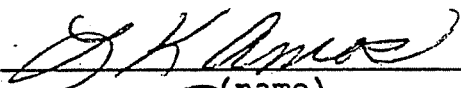
By:   
VP (name)  
(title)

EXHIBIT A

(Form of Series 1992 Bond)

(Face of Series 1992 Bond)

Registered  
No. R-\_\_

REGISTERED

UNITED STATES OF AMERICA  
COMMONWEALTH OF KENTUCKY

BOARD OF WATER WORKS OF THE  
CITY OF LOUISVILLE, KENTUCKY  
LOUISVILLE WATER COMPANY  
WATER SYSTEM REVENUE BOND, SERIES 1992

INTEREST RATE: \_\_\_\_\_ MATURITY DATE: \_\_\_\_\_

REGISTERED OWNER: \_\_\_\_\_

PRINCIPAL AMOUNT: \_\_\_\_\_

THE BOARD OF WATER WORKS OF THE CITY OF LOUISVILLE, KENTUCKY (the "Issuer"), a de jure political subdivision of the Commonwealth of Kentucky, acting as the governing body of the Louisville Water Company (the "Company"), a public body corporate and an instrumentality of the City of Louisville, Kentucky, for value received, hereby promises to pay, but solely from the funds provided therefor by the Company as hereinafter set forth, to the REGISTERED OWNER set forth above, upon presentation and surrender of this Bond on the MATURITY DATE specified above (unless redeemed prior thereto as hereinafter provided), the PRINCIPAL AMOUNT set forth above, and to pay, but solely from said funds, interest thereon from the most recent interest payment date to which interest has been paid, or, if no interest has been paid, from the date hereof, until the maturity or earlier redemption of this Bond, at the INTEREST RATE per annum specified above, payable semiannually on the 15th day of May and the 15th day of November in each year, commencing November 15, 1992.

The principal of, redemption price, if any, and the interest on this Bond are payable in any coin or currency of the United States of America which, at the respective date of payment thereof, is legal tender for the payment of public and private debts. Payment of the interest on this Bond on any interest payment date will be made to the person appearing as of the first days of May or November next preceding the interest payment date on the bond registration books of the Issuer as the registered owner hereof, such interest to be paid by check or draft mailed on each interest

payment date to the registered owner at his address, as the same appears on such registration books as of the first days of May or November next preceding the interest payment date. The principal and redemption price, if any, of this Bond are payable at the principal corporate trust office of First National Bank of Louisville, Louisville, Kentucky, as Trustee (or any successor appointed pursuant to the provisions of the Resolution herein mentioned).

REFERENCE IS HEREBY MADE TO THE FURTHER PROVISIONS OF THIS BOND ON THE REVERSE SIDE HEREOF, WHICH FURTHER PROVISIONS SHALL FOR ALL PURPOSES HAVE THE SAME EFFECT AS IF SET FORTH AT THIS PLACE.

This Bond is issued under the provisions of Sections 58.010 to 58.190, inclusive and Sections 96.230 to 96.315, inclusive, of the Kentucky Revised Statutes (collectively, the "Act"), and does not constitute an indebtedness of the City of Louisville, Kentucky, the Company or the Issuer within the meaning of the Constitution and laws of the Commonwealth of Kentucky or any political subdivision thereof or a pledge of the faith and credit of the City of Louisville, Kentucky, the Company or the Issuer or the Commonwealth of Kentucky or any political subdivision thereof, but is payable solely from the funds provided therefor under the terms and provisions of the Resolution herein mentioned, and the Issuer is not obligated to pay this Bond except from such funds. The issuance of this Bond shall not directly, indirectly or contingently obligate the City of Louisville, Kentucky, the Company or the Issuer or the Commonwealth of Kentucky or any political subdivision thereof to levy or to pledge any taxes whatever therefor or to make any appropriation for its payment except from such funds.

All acts, conditions and things required by the Constitution and laws of the Commonwealth of Kentucky and the resolutions of the Issuer or the Company to happen, exist and be performed precedent to and in the issuance of this Bond have happened, exist and have been performed as so required.

This Bond shall not be valid or become obligatory for any purpose or be entitled to any benefit under the Resolution until the certificate of authentication hereon shall have been signed by the Trustee.

IN WITNESS WHEREOF, the Board of Water Works of the City of Louisville, Kentucky, has caused this Bond to be signed by the manual signature of its President and to be sealed by imprinting hereon a manual impression of the official seal of said Issuer, attested by the manual signature of the Treasurer of said Issuer, all as of the 1st day of August, 1992.

BOARD OF WATER WORKS OF  
THE CITY OF LOUISVILLE, KENTUCKY  
LOUISVILLE WATER COMPANY

\_\_\_\_\_  
President

[SEAL]

Attest:

\_\_\_\_\_  
Treasurer

(ENDORSEMENT UPON BONDS)

TRUSTEE'S CERTIFICATE OF AUTHENTICATION

This Bond is one of the Bonds of the Series designated herein and issued under the provisions of the within-mentioned Resolution.

FIRST NATIONAL BANK  
OF LOUISVILLE  
as Trustee

By \_\_\_\_\_  
Authorized Officer

Date of Authentication: \_\_\_\_\_

(Reverse of Form of Series 1992 Bond)

This Bond is one of a duly authorized series of \$74,835,000 principal amount of revenue bonds of the Issuer, designated "Water System Revenue Bonds, Series 1992" and referred to as "Bonds" herein, and is being issued for the governmental purposes set forth in a Resolution duly enacted by the Issuer, acting as the governing body of the Louisville Water Company on July 14, 1992, as supplemented by Resolution duly enacted by the Issuer on August 5, 1992 (collectively, the "Resolution"). All of the Bonds are issued under and pursuant to the Resolution. Copies of the Resolution are on file at the office of the Trustee. Reference is hereby made to the Resolution for the provisions, among others, with respect to the custody and application of the proceeds of Bonds issued under the Resolution, the collection and disposition of revenues, the funds charged with and pledged to the payment of the interest on and the

principal of the Bonds, the nature and extent of the security, the terms and conditions on which the bonds of each series are or may be issued, the rights, duties and obligations of the Issuer, the Company and the Trustee and the rights of the registered owners of the Bonds, and, by the acceptance of this Bond, the registered owner hereof assents to all the provisions of the Resolution.

The Resolution provides for the issuance, from time to time, under the conditions, limitations and restrictions therein set forth, of additional Series of Bonds for the purpose of paying all or a part of the cost of necessary additions or improvements to the Waterworks System of the Company (together with renewals, replacements, additions, extensions and betterments and all further additions, extensions, improvements and betterments thereto and renewals and replacements thereof, being herein referred to as the "Waterworks System") and for the purpose of refunding any obligations issued in connection with the Waterworks System under the provisions of the Resolution or otherwise. The aggregate principal amount of Bonds which may be issued under the Resolution is not limited except as provided in the Resolution, and all Bonds issued and to be issued under the Resolution are and will be equally secured by the pledges and covenants made therein, except as otherwise expressly provided or permitted in the Resolution.

The Resolution, in accordance with and as required by the Act, provides for the fixing and collecting of rates and charges for water furnished by the Waterworks System which will be sufficient at all times to pay the principal of and the interest on all Bonds issued under the provisions of the Resolution and then outstanding as the same shall become due, and to provide a reserve therefor, to provide an adequate depreciation fund, and to pay the cost of maintaining, repairing and operating the Waterworks System.

This Bond is transferable, as provided in the Resolution, only upon the books of the Issuer kept for that purpose at the above-mentioned office of the Trustee, by the registered owner hereof in person, or by his attorney or duly authorized legal representative, upon surrender of this Bond together with a written instrument of transfer satisfactory to the Trustee duly executed by the registered owner or his attorney or duly authorized legal representative, and thereupon a new registered Bond or Bonds, in the same aggregate principal amounts, shall be issued to the transferee in exchange therefor as provided in the Resolution, and upon payment by such registered owner of the charges therein prescribed. The Issuer, the Trustee and any paying agent may deem and treat the person in whose name this Bond is registered as the absolute owner hereof for the purpose of receiving payment of, or on account of, the principal or redemption price hereof and interest due hereon and for all other purposes.

The Series 1992 Bonds are issued in the forms of both Series 1992 Serial Bonds and Series 1992 Term Bonds, all of which

rank on a basis of parity and equality with one another. The Series 1992 Bonds are issuable in the form of registered Bonds without coupons in the denomination of \$5,000 or any integral multiple of \$5,000.

The Series 1992 Bonds are subject to redemption as follows:

(a) Optional Redemption. The Series 1992 Bonds maturing on and after November 15, 2001 are subject to redemption, at the option of the Issuer, on or after November 15, 2000, in whole at any time or in part on any interest payment date at the redemption prices (expressed as percentages of the principal amount of such Bonds to be redeemed) plus accrued interest to date of redemption set forth below:

<u>Redemption Periods (Dates Inclusive)</u>	<u>Redemption Price</u>
November 15, 2000 November 14, 2001.....	102%
November 15, 2001 November 14, 2002.....	101%
November 15, 2002 and thereafter.....	100%

In the event of optional redemption, in part, the Issuer may direct the maturity or maturities, and the amounts thereof, to be so redeemed.

(b) Sinking Fund Redemption. The Series 1992 Term Bonds maturing November 15, \_\_\_\_\_, are subject to mandatory Sinking Fund Installment redemption prior to maturity, in part, at a redemption price equal to 100% of the principal amount thereof plus interest accrued and unpaid to the redemption date, from mandatory Sinking Fund Installments which are required to be made in amounts sufficient to redeem on the dates shown below the principal amount of such Series 1992 Term Bonds shown below (the "Mandatory Redemption Requirements"):

<u>Series 1992 Term Bonds Due November 15,</u>	
<u>November 15</u>	<u>Amount</u>

[NOTE: Term Bond provisions to be inserted when available]

Any such redemption, either in whole or in part, may be made upon at least thirty (30) days' prior notice by mail and otherwise as provided in the Resolution shall be made in the manner and under the terms and conditions provided in the Resolution. On the date designated for redemption, notice having been mailed and moneys for payment of the redemption price being held by the Trustee



ASSIGNMENT

\_\_\_\_\_  
please insert social security  
or other identifying number  
of assignee

For value received the undersigned hereby sells, assigns,  
and transfers the within Bond, and all rights thereunder,  
unto \_\_\_\_\_

\_\_\_\_\_  
Please print or typewrite name and address including zip code of  
assignee and does hereby irrevocably constitute and  
appoint \_\_\_\_\_, Attorney, to transfer said  
bond on the registration books of the within-named Trustee, with  
full power of substitution in the premises.

Dated: \_\_\_\_\_

NOTICE: The signature to this assignment must correspond with the  
name as it appears on the face of the Bond in every particular,  
without alteration or enlargement or any change whatever.