DIRECT TESTIMONY

of

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Illinois-American Water Company

Proposed general increase in water and sewer rates

Docket No. 09-0319

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Introduction

Q. Please state your name and business address.

A. My name is Peter Lazare. My business address is 527 East Capitol Avenue, Springfield, Illinois 62701.

Q. What is your present position?

A. I am a Senior Rates Analyst with the Illinois Commerce Commission ("Commission"). I work in the Financial Analysis Division on rate design and cost-of-service issues.

Q. What is your experience in the regulatory field?

A. My experience includes seventeen years of employment at the Commission where I have provided testimony and performed related ratemaking tasks. My testimony has addressed cost-of-service, rate design, load forecasting and demand-side management issues that concern both electric and gas utilities.

Previously, I served as a Research Associate with the Tellus Institute, an energy and environmental consulting firm in Boston, Massachusetts. I also spent two years with the Minnesota Department of Public Service as a Senior Rate Analyst, addressing rate design issues and evaluating utility-sponsored energy conservation programs.

Q. Please discuss your educational background.

A. I received a B.A. in Economics and History from the University of Wisconsin and an M.A. in Economics from the University of Illinois at Springfield in 1996.

Q. What is the purpose of your testimony in this proceeding?

A. My testimony presents a review of the cost studies and demand factors prepared by Illinois-American Water Company (the "Company" or "IAWC") for this docket. I identify the strengths and weaknesses of the Company's proposals and then make recommendations about whether they should be accepted for ratemaking in this proceeding.

Q. Please begin your discussion by summarizing your conclusions in this proceeding.

A. I draw two separate conclusions about the Company's proposed cost of service studies and the factors that were developed to allocate the components of those cost studies among customer classes.

I find the Company's proposed cost of service studies conform to the approach presented in the American Water Works ("AWWA") M 1 manual and therefore provides a reasonable basis for allocating costs in this proceeding. With regard to the demand factors for the maximum day and maximum hour derived by the Companies to allocate system costs, I find IAWC's approach to be fundamentally flawed.

Q. What changes do you recommend in the Company's cost allocation methodology?

A. I recommend that IAWC's proposed maximum day and maximum hour demand factors be replaced by an alternative set of factors designed to address shortcomings in the Company's methodology. These revised demand factors when applied to the Company's cost studies generate an alternative set of cost study results that more accurately reflect the underlying cost of service.

Q. How is the remainder of your testimony organized?

A. I begin by discussing the general cost of service approach proposed by the Company in this case. Then, I discuss the choice of allocators for the Company's cost of service studies. Last, I address the demand factors that were devised to allocate system costs among rate classes.

Cost of Service Methodology

Q. What aspects of the Company's cost of service approach will you address in your testimony?

A. I will address two areas. The first concerns the various allocators chosen by IAWC to allocate system costs among rate classes. Second, I examine the derivation of the allocators themselves. For cost study results to be accurate, not only must the choice of allocators be reflective of costs, but the method by which

those allocators are developed must be accurate as well. If the proposed allocator fails to reasonably represent the demands of rate classes, then the allocation of costs will be inaccurate and the results of the study will be problematic.

Q. Please provide a general overview of the cost of service method the Company employed for this proceeding.

A. The Company uses the base-extra capacity method to allocate system costs to the residential, commercial, industrial, other public authorities, sales for resale (including large sales for resale), private fire protection and public fire protection classes. (IAWC Ex. 9.00, pp. 4-5.)

Q. What is the base-extra capacity method?

A. This approach is comparable to the average and excess method for allocating gas and electric utility costs. Average demands are used to allocate the base portion of system costs and noncoincident peak ("NCP") demands are used for the "extra" component of costs required to meet the demands that exceed the average.

Q. What are NCP demands?

A. These are the maximum demands for each individual customer class for the year. The maximum demands for different customer classes may occur at the same time or they may occur on different days of the year.

Q. What is the argument for using NCP demands to allocate "extra" costs?

A. The argument, as presented in the AWWA M 1 manual, focuses on the benefits to the system of customer diversity. If separate systems had to be built for individual customer classes, each system would have to be sized to meet the peak demands of that class. The advantage of constructing a system to collectively serve all classes is that the scale of facilities can be downsized because of customer diversity. The base-extra method considers the NCP demands an appropriate method to apportion the benefits of these diversity savings among rate classes. (AWWA M 1 Manual, Appendix A, pp. 300-301.)

Q. How does Company witness Herbert justify using the base-extra method?

A. He states that this approach "is a recognized method" for allocating water costs "in proportion to the classifications' use of the commodity, facilities, and services." Mr. Herbert goes on to contend that the base-extra method "is generally accepted as a sound method for allocating the cost of water service." He further notes that this approach was used by the Company in previous cases. (IAWC Ex. 9.00, p. 5.)

Q. What is your opinion of the base-extra approach?

A. While I consider it acceptable for ratemaking in this case, the base-extra method is flawed in one key respect. The problem lies with the use of NCP demands to allocate demand-related costs. The evidence indicates that the size of key

facilities required to serve the demands of ratepayers from multiple rate classes are shaped by coincident peak demands, rather than noncoincident peak demands. Coincident peak demands reflect the demands by all classes at the time the system peaks. Thus, the Company's focus on NCP demand to allocate these costs is misplaced.

A case in point is provided by the new water treatment plant constructed to serve the Champaign service territory. The plant was built to serve not just individual rate classes but all classes in the district on a collective basis. Furthermore, the plant must be of sufficient size to meet the collective peak demands of all rate classes in the district. So what is important is the demand of classes at the time the system peaks, rather than individual peak demands that may occur at some other time. Thus, coincident peak demands are the important factor to consider in allocating the plant's costs and the base-extra's focus on NCP for allocating these costs is misplaced.

Q. Why do you nevertheless accept the base-extra method for ratemaking in this case?

A. This approach, despite its flaws, has been accepted for water utility ratemaking in Illinois for many decades. Thus, there is considerable precedent for using the base-extra method in this case.

Q. Do you make any additional recommendation concerning the base-extra cost allocation methodology?

A. Yes, I recommend that the Company be ordered in its next rate case to prepare a cost of service study based upon coincident capacity factors. Such an approach would employ coincident peak demands to allocate system costs that are jointly used by multiple rate classes. This approach, which is described in Appendix A of the AWWA M 1 Manual, would more accurately reflect how system costs are actually incurred and thereby send better price signals concerning the impact of ratepayer demands on system costs.

Cost Allocation

Q. Please discuss the allocators chosen by IAWC for system costs.

A. The cost of service approach for various system costs is described in Mr. Herbert's direct testimony. For example, he indicates that purchased water, purchased electric power, treatment chemicals and waste disposal are allocated according to average usage because these are base costs incurred in proportion to the amount of water consumed. (IAWC Ex. 9.00, p. 6.)

Mr. Herbert goes on to indicate that costs such as other source of supply, water treatment and transmission costs are sized to meet peak demands and consequently were allocated partly according to base average daily demands consumption, partly by maximum day extra capacity, and, for certain pumping

stations and transmission mains, partly as fire protection costs. (IAWC Ex. 9.00, pp. 6-7.)

Mr. Herbert indicates that storage costs and distribution mains were allocated by a combination of average daily demands and maximum hour extra demand including fire demand which these facilities are designed to serve. He further indicates that fire demands were allocated between public and private fire protection according to their relative potential demands on the system. (IAWC Ex. 9.00, p. 7.)

The proposed study allocates pumping facilities costs and mains operating and maintenance by both maximum day and maximum hour extra capacity because these facilities serve both functions. Costs for meters and services were allocated by “equivalents” in terms of size and quantities serving each customer class. Public fire hydrant costs were assigned to public fire protection. (IAWC Ex. 9.00, pp. 7-8.)

Customer costs such as customer accounting, billing and collecting were allocated on a customer basis while meter reading was allocated by the number of metered customers. Administrative and general costs were allocated in a variety of ways according to allocated direct costs. (IAWC Ex. 9.00, p. 8.)

Q. Do the Company's proposed studies include assumptions concerning the level of fire flow for each district?

A. Yes. The assumptions range from a high of 16,000 gallons per minute ("gpm") for 10 hours for Zone 1 down to 2,500 gpm for 2 hours for Lincoln, with other districts falling between these extremes. (IAWC Response to Data Request AG 2.18)

Q. How does the Company justify these fire flows?

A. The Company states that the flow data for all systems except Zone 1 were based on hydrant flow data from Insurance Services Office, Inc. For Zone 1, the Company relied on flow requirements recommended by the National Board of Fire Underwriters (now the American Insurance Association). As far as duration is concerned, the Company relied on the Grading Schedule for Municipal Fire Protection from Table 4 of the Insurance Services office which was furnished by the Company. (IAWC Response to Data Request AG 2.18.)

Q. How do you assess these calculations of fire demands?

A. The Company appears to have relied on generally accepted sources of information on which to develop these fire demand figures. Based on this evidence, I have not identified any shortcomings in IAWC's calculation of these demands.

Q. Regarding the allocators in the Company's proposed cost of service study, what conclusions have you reached?

A. I find that the Company's proposed allocators for system costs are consistent with both Commission precedent in Illinois and with cost allocation principles presented in the AWWA's M 1 Manual. In the discovery process, the Company was able to explain how the allocators it has chosen for various system costs are consistent with past practice in Illinois and with the methodology discussed in the AWWA's M 1 Manual.

Derivation of Demand Factors

Background

Q. Please explain why the derivation of demand factors is an important issue in the cost allocation process.

A. This is a critical step because the allocators must be accurately estimated to ensure that each class is allocated a reasonable amount of costs. If they are calculated inaccurately, that will undermine the cost of service study results.

Q. Have these Company demand factors been controversial in recent cases?

A. Yes, the issue of calculating demand factors (or demand ratios) was raised as far back as the Company's 2002 rate case (Docket No. 02-0690). In that case, the Commission noted concerns that the demand ratios being used "are based on

outdated data." (Order, Docket No. 02-0690, p. 119, August 12, 2003.) The Commission went on to state:

> With regard to this issue, as stated above, Staff has recommended that IAWC be required to present updated customer demand factors in the Company's next rate filing. The Commission believes such information will help address the concerns cited by other parties. Accordingly, IAWC is directed to provide updated demand factors for each rate area for which a rate increase is proposed. (Order, Docket No. 02-0690, p. 120, August 12, 2003.)

Q. How did the Company respond to the Commission's directive?

A. IAWC presented a new set of demand ratios in its next rate case (Docket No. 07-0507) that were based on a demand study performed in the Interurban district.

Q. Was the Commission satisfied with the way those ratios were developed?

A. No, it stated that IAWC "did not comply" with its directive in Docket No. 02-0690 because the Commission sought demand studies for all districts and IAWC performed a study for only one. The Commission went on to explain:

> Why IAWC disregarded the Commission's directive to provide a demand study for each district is unclear to the Commission, but it is crystal clear from the discussion in the 02-0690 Order regarding cost of service and rate design why this information is necessary and was required. (Final Order, Docket No. 07-0507, July 30, 2008, p. 121.)

The Commission also rejected the use of the cost studies for designing rates in that case, stating as follows:

> Due to IAWC's decision not to provide demand factors for each district, as directed by this Commission in Docket 02-0690, the Commission does not have an accurate estimate of the cost of serving each customer class in each district. (Final Order, Docket No. 07-0507, July 30, 2008, p. 122.)

Q. How did the Commission seek to remedy the problem of deficient demand factors?

A. The Commission initiated a follow-up docket (Docket No. 08-0463) to address cost of service and rate design issues. In that Initiating Order, the Commission directed IAWC "to provide updated demand factors for each area and an updated cost of service study." (Initiating Order, July 30, 2008.) The Commission further directed that a schedule be adopted to "put the Commission in a position to have an order before it for consideration at the earliest possible time consistent with statutory mandates and due process of law." (Initiating Order, July 30, 2008.)

Q. What was the first critical issue to be addressed in Docket No. 08-0463?

A. That first issue was the methodology to be employed to derive demand factors for the cost of service study. The alternatives were to either measure demands directly or use an indirect approach to estimate those demands. A direct approach entails placing time-sensitive meters on a sample of customers to measure their demands on a real time basis. The pattern of usage for the sample over time then provides the basis for conclusions about the demands of all customers on the system. An indirect method seeks to estimate these same demands with all available data that can be gathered without expending the time and resources necessary to measure demands directly.

Q. What approach did the Company propose for this docket?

A. IAWC proposed to use an indirect method to develop these factors. The Company's proposal to use an indirect approach was presented in a Joint Motion to the Commission, which was subsequently approved. (Notice Of Commission Action, Docket No. 08-0463, October 15, 2008.)

Q. What are the advantages of using an indirect method as the Company proposes to derive demand factors for this case?

A. An indirect approach could derive demand factors more quickly and thereby would conform more closely to the expedited timeframe envisioned by the Commission for this case. Conclusion (5) of the Commission's Initiating Order for this proceeding issued on July 30, 2008 states that, "the Administrative Law Judge or Judges assigned to this proceeding should be directed to expeditiously create, and to require all parties to adhere to, a schedule that will put the Commission in a position to have an order before it for consideration at the earliest possible time consistent with statutory mandates and due process of law."

Using direct measurement to estimate these factors would delay the process. A period of time would be necessary to install recording meters on a sample of customers in each IAWC district. Then, those meters would have to be in place recording data over a full summer period to gather the requisite data. Since the Initiating Order for Docket No. 08-0463 was issued in the middle of the 2008

summer, the necessary data for a demand study could not be gathered until the conclusion of the 2009 summer. Thus, any proceeding to allocate costs based on directly measured demands could not even begin until the fall of 2009 at the earliest. Such a timeframe would conflict with the Commission's objective of entering an order "at the earliest possible time." This time issue alone would argue for using an indirect method to develop demand factors for the Company.

The indirect method also presents a cost advantage over the direct approach. The indirect method would avoid the expense of installing time sensitive meters, gathering data from those meters and developing demand factors from the data which would all be required to directly measure ratepayer demands.

Q. Did the Joint Motion's proposal to use an indirect approach describe in detail the methodology to be used?

A. No, the descriptions of the methodology were general in nature. This is the Company's explanation for the method for developing class maximum day demands:

> a. The system's maximum day to maximum month ratio from Task 2b will be used to adjust customer class average day demands for the maximum billing period to annual average day ratios for each respective year.
> b. Additional adjustments will be used to recognize potential variations in weekly water use by customer class. To the extent possible, actual demand data will be reviewed and used as a possible basis for establishing potential weekly use adjustment factors. (Joint Motion, October 3, 2008, Att. A, p. 2, Task 4.)

The proposed method for estimating relative class maximum hour demands is discussed accordingly:

a. Maximum day ratios determined in Task 4 will be used to estimate maximum hour to average day ratios based on the manner in which each customer class typically uses its water during the day. To the extent possible, actual demand data will be used as a basis for establishing potential maximum hour to maximum day adjustment factors.
b. Where available, actual maximum hour demand data will be used to verify the estimated maximum hour ratios. Recognition will be given to differences in available sale for resale customer's storage capacity which will dampen the maximum hour demands of some sale for resale customers more than others. (Joint Motion, October 3, 2008, Att. A, p. 2, Task 5.)

Q. Please comment on the lack of detail in the Joint Motion's description of its proposed approach.

A. The Joint Motion clearly left to a later date discussion of a specific plan for developing these demand factors. This is evident from the references to "additional adjustments to recognize potential variations in weekly water use" for its proposed method for estimating maximum day demands without specifying what those adjustments will be. (Joint Motion, October 3, 2008, Att. A, p. 2, Task 4 and Task 5.) Similarly, the Joint Motion states that, "[t]o the extent possible, actual demand data will be reviewed and used" in developing those demands but does not indicate what demand data is being considered or how they will be used to formulate demand factors. (Joint Motion, October 3, 2008, Att. A, p. 2, Task 4 and Task 5.)

The discussion of maximum hour demands raises similar questions. The Joint Motion indicates that maximum day demands will be used to derive these factors but does not explain how. It also states that actual demand data will be factored into the calculation but provides no clear blueprint for how that will be done.

Q. Based on the preceding discussion, how do you regard the Commission's approval of the Joint Motion?

A. The Commission's approval was limited to a general proposal initiated by IAWC to calculate these demand factors on an indirect basis. Since the Company's subsequent specific approach was not presented to the Commission in that motion, there is no reason to assume that the Commission has approved in advance the specific approach that IAWC has presented in this rate proceeding.

Q. When were the Company's specific calculations of its proposed demand factors presented?

A. They were presented in IAWC's subsequent filing of its direct testimony in Docket No. 08-0463. Those factors were incorporated into cost studies that IAWC used to develop proposed rates for each of its Illinois districts in this rate proceeding.

Q. How did Docket No. 08-0463 conclude?

A. It was prematurely concluded by the Commission when IAWC filed a new rate case in the middle of that docket. The new rate case covered the same topics as

Docket No. 08-0463 but included rates and cost studies that conformed to a new set of revenue requirements for the districts. Instead of conducting two overlapping cases for the Company that addressed rate design issues, the Commission ended Docket No. 08-0463 and carried the issues over to the current proceeding. The demand factor methodology developed for Docket No. 08-0463 is now being sponsored by IAWC in the current proceeding.

IAWC's Proposed Methodology

Q. What is the Company's method of deriving demand factors in this case?

A. The Company proposes to use what it terms a "Multi-Year Study" to develop those factors. That study, as discussed in the testimony of Company witness J. Rowe McKinley, is used to derive both maximum day and maximum hour capacity factors. (IAWC Ex. 13.00, p. 4.)

Q. Please explain how the Company has developed its proposed maximum day capacity factors.

A. The Company states that it has developed an approach that conforms to the methodology outlined in AWWA's Manual M-1. (IAWC Ex. 13.01(Rev.), p. 2.) IAWC examines pumpage data for the various districts to determine the years with highest ratios of maximum demand to average demand. (IAWC Ex. 13.01 (Rev.), p. 2.) The Company notes that the highest ratios do not always occur in the same year as the highest maximum day demand and identifies Champaign, Lincoln and Pekin as rate areas where the two occur in different years. (IAWC

Ex. 13.01(Rev.), p. 4.) Nevertheless, the Company's analysis of maximum day capacity factors utilizes the year with maximum demand to average demand ratios, rather than with maximum day demands.

Q. What is the next step in IAWC's calculation of capacity factors?

A. IAWC then develops class demand factors to correspond to these system ratios. These factors are developed on the basis of non-coincident peak demands for each class. To derive these factors for each class in each district, the Company first divides the class' average daily demand for the peak month by the average daily demand for the year to calculate what it terms the "minimum maximum day capacity factor." The resulting minimum maximum day capacity factors for all classes in all districts are presented in Table 7 on p. 15 of IAWC Ex. 130.01 (Rev.).

Q. How are these factors used to develop IAWC's proposed maximum day demand factors for the residential class?

A. That entails a number of steps. Perhaps, the key step is the Company's use of pumpage data for four Chicago Metro areas comprising 2,161 residential accounts to derive capacity factors for all Illinois districts. These four areas were chosen because they are almost entirely residential and, in the Company's estimation, reflect the pattern of usage by all Illinois customers over the course of the peak month. IAWC then analyzed pumpage statistics for these four areas during the peak month of July 2005. The Company determined that peak day

pumpage during the peak month of July amounted to 1.578 times the average daily pumpage for that month. (IAWC Ex. 13.01 (Rev.), p. 16.)

This figure of 1.578 was used to derive residential maximum day ratios for each Illinois district. To do that, IAWC began with the daily variation for each system which is the system's maximum day demand divided by average daily flow for the year's maximum month. The Company then divided the figure of 1.578 from the four Chicago areas by each system's daily variation to generate residential daily variation ratios for each district as shown in Table 8 on p. 15 of IAWC Ex. 13.01 (Rev.).

The final step in deriving residential maximum day capacity factors for each district is presented in Table 10 on p. 18 of IAWC Ex. 13.01 (Rev.). For the residential class, those factors are the product of: (a) the district maximum day to average day pumpage ratio; (b) the minimum maximum day capacity factors for the residential class; and (c) the residential daily variation ratio.

To illustrate, IAWC calculates a residential capacity factor for the Sterling district by multiplying: (1) the district's maximum day to average day during the peak month ratio of 1.151; (2) the residential minimum maximum day capacity factor of 122.3%; and (3) the estimated residential daily variation factor of 1.4. This produces a residential capacity factor of approximately 195%. (IAWC Ex. 13.01 (Rev.), Table 10, p. 18)

Q. How does the Company justify using the Chicago Metro data for other districts?

A. The Company provides a brief explanation of why this data was used in its filing as follows:

> In developing Figure 1 to illustrate daily residential demands and relationships for the Chicago Metro rate area, it became apparent that the indicated relationship between maximum day and average day within the maximum month could be useful as a potential basis to estimate residential daily variation adjustment factors for each rate area. (IAWC Ex. 13.01 (Rev.), p. 16)

IAWC provided further justification for its proposed approach in response to discovery. The Company argued that the use of this data when applied to the various districts produced a range of diversity factors for districts of 1.1 to 1.4 which is "identified as acceptable in AWWA Manual M1." IAWC went on to state that "[b]ecause use of the calculated Residential MD/ADMM for the four Chicago Metro districts corroborated the preliminary RDV factors, it was determined that basing the final proposed capacity factors on calculated Residential MD/ADMM was appropriate." (IAWC Response to Staff Data Request PL 2.30.)

Q. Please describe how the maximum day capacity factors were developed for the commercial class.

A. These factors were developed in a similar manner to the residential capacity factors. The commercial factors also rely on the system maximum day to average day ratios and residential daily variation ratios employed for the residential class. Included in the calculation is the ratio of average peak month daily usage to average annual daily usage for the commercial class, rather than

the residential class. The Company further multiples this figure by the class variation for the commercial class. (IAWC Ex. 13.01 (Rev.), p. 18.)

Q. What purpose does this commercial class variation serve?

A. It seeks to estimate the scale of commercial class peak demands in comparison to residential peak demands over the maximum month. The class variation for the commercial class has been estimated by the Company at 85% of residential demand. Multiplying the maximum day capacity factors by this 85% significantly reduces the maximum day capacity factor for the commercial class relative to the residential class as shown on Table 11 of IAWC Ex. 13.01 (Rev.), (p. 20).

Q. How was this commercial class variation figure derived?

A. It represents a judgment about the scale of that class' peak demands relative to residential peak demands, based on relative class capacity factors from Docket No. 07-0507 and evidence from Docket No. 02-0690 and Docket No. 00-0340. The Company indicates that greater weight was accorded to factors from the earlier dockets in deriving these estimates. (IAWC Ex. 13.01 (Rev.), p. 17.)

Q. How do you assess the Company's method of deriving maximum day capacity factors for this case?

A. The Company's proposed calculation methodology presents a number of problems that undermine its value for use in the ratemaking process.

Q. What is your primary concern with the Company's method of calculating maximum day capacity factors for the residential class?

A. My primary concern lies with the use of Chicago Metro maximum month ratios to produce maximum day demand factors for all districts. As previously noted, the ratios are used to develop residential variations for the peak month for all districts in Illinois. However, the Company has failed to demonstrate that the pattern of demands for these customers accurately reflects the demands of IAWC customers on a statewide basis.

Q. Is there reason to believe that Chicago Metro usage is more weather-sensitive than other districts?

A. Yes. I base this conclusion on an examination of residential usage patterns for each of IAWC's Illinois districts presented in the attached Schedule 1. The schedule presents the ratios of average daily usage for the peak month relative to residential daily usage for the year for the districts and indicates that the ratio for Chicago Metro is significantly higher than other districts in the state. The Chicago Metro ratio is 147%, while the ratios for the other districts range from 110% to 135%.

These figures suggest that Chicago Metro has a greater share of weather-sensitive demand than other districts in the state. If so, then Chicago Metro residential customers may exhibit greater daily variation in usage than residential

customers in other districts not just on an annual basis but also during the course of the maximum month.

Q. How does the export of these Chicago Metro residential ratios affect variation in residential usage in other districts?

A. It leads to variations in residential usage over the maximum month that significantly exceed the variation in pumpage for the district as a whole.

Q. Can you provide an illustration?

A. Yes, a closer examination of residential and system demands for the Pekin district reveals the nature of the issue. Table 6 of IAWC Ex. 13.01 (Rev.) presents average maximum month daily usage for each of the rate classes in the Pekin district, while Table 2 presents maximum month pumpage for the district as follows:

(Mg/day)

Residential	Commercial	Industrial	Other Public Authority	Total Pumpage
3,044.2	894.7	3,299.0	726.4	10,206

Furthermore, Table 8 of that exhibit presents daily variation for the peak month of 1.60 Mg/day for Pekin's residential class and 1.014 Mg/day for the system as a whole. The 1.60 Mg/day figure means that IAWC estimates peak day usage for the residential class at 160% of its average daily usage for the class over the maximum month. Since the average residential daily usage for that month is 3,044.2 Mg/day, the Company estimates peak day usage for the class at 1.60 x

3,044.2 or 4,871 Mg/day. Thus, the residential class' usage is 1,826.5 Mg/day greater on the peak day than on the average day for the maximum month.

For the Pekin system as a whole, the daily variation figure of 1.014 Mg/day means that peak day usage is 101.4% of average daily use for the maximum month. Taking 101.4% of the 10,206 Mg/day average daily use for the month produces a system peak day usage for the system of 10,353 Mg/day, which is 147 Mg/day greater than the district's average daily pumpage for the maximum month. Thus, while maximum daily pumpage for the Pekin system exceeds the average for the maximum month by 147 Mg/day, the maximum daily consumption for Pekin's residential class exceeds the class average for the maximum month by 1,826 Mg/day.

The implication of these two numbers is that maximum month daily variation is significant for the residential class but minimal for the system as a whole. For the system to exhibit minimal variation, the significant swings in residential usage must be balanced by opposing behavior of other Pekin customers. So, at the times that residential customers use more, other Pekin customers must use significantly less than their average for the maximum month to generate the minimal variation in Pekin district demand measured by IAWC. For instance, if residential customers use 1,826 Mg/day on the peak day more than their average for the maximum month, then other customers must use between 1,600 and 1,700 Mg/day below their average to produce a maximum day pumpage for the district as a whole that is only 147 Mg/day higher than the average day for

the maximum. Stated differently, remaining classes would have to collectively consume less than 70% of their average maximum month usage on the maximum day to balance the residential maximum day usage calculated by IAWC.

Q. Would it be possible for other customers to use so little water on the day that residential usage peaks?

A. Such an outcome might be possible if the peak day for the residential class occurred on a weekend day when businesses may be closed and their consumption would be less. However, if the residential maximum day demand fell on a weekday when other classes may be presumed to consume at or above their average, then the much greater difference between the maximum day and daily maximum month average for the residential class than for the district as a whole would be difficult to explain.

Q. What is the available evidence concerning the day of the week on which residential usage peaks?

A. The analysis of the four Chicago Metro areas used to develop the maximum day to average day ratio for the maximum month for all districts identified a peak pumpage day of July 9, 2005, which is a Saturday. (IAWC Ex. 13.01 (Rev.), p. 16.) However, the demand study for the Interurban district performed for Docket No. 07-0507 identified a peak day for residential customers of August 8, 2007, which is a Wednesday. (IAWC Ex. 11.01, p. II-2, Docket No. 07-0507.) If, as this

study suggests, residential demands were to peak on a weekday for districts such as Pekin, Sterling or SPSPSB (the Southern, Peoria, Streator, Pontiac and South Beloit areas), it is not clear why demands by other classes would be below average to counteract the significant spike in residential peak day usage assumed by the Company.

Q. Does the Company's approach produce any other anomalous results?

A. Yes. The lower the daily variation over the peak month measured for the system as a whole, the higher the Company's estimate of residential daily variation for that peak month. For the Pekin system, IAWC findsthat peak day pumpage is 1.4% greater than average day pumpage for the month as a whole. However, when it comes to residential daily variation, the Company estimates that peak day usage exceeds average usage for the maximum month by 60%. (IAWC Ex. 13.01 (Rev.), Table 8, p. 15.) It is not clear how this significant variation in residential usage can be consistent with such a small variation in system usage over the peak month.

Q. Does the Company's assumption that other districts will follow peak month usage patterns for these 2,161 Chicago Metro accounts present any other problems?

A. Yes, it appears to be inconsistent with the opinion expressed by the Commission in its Order for Docket No. 07-0507 which stated as follows:

> As noted by the AG and LWC, the demand factors for each district are based on the demand factors of the Interurban District. For the

> reasons discussed by the AG and LWC, the Commission is not convinced that the demand factors for the Interurban District are reasonable proxies for the demand factors in IAWC's remaining districts. Due to IAWC's decision not to provide demand factors for each district, as directed by this Commission in Docket No. 02-0690, the Commission does not have an accurate estimate of the cost of serving each customer class in each district. (Order, Docket No. 07-0507, p. 121, July 30, 2008.)

In this case, the Company again proposes to apply demand patterns for customers in one district to usage by customers in other districts. Thus, the concerns expressed by the Commission in Docket No. 07-0507 about whether the demands in one district would be "reasonable proxies" for other districts apply to this case as well.

Q. Do these concerns about residential demand factors extend to the demand factors calculated for other classes?

A. Yes. That is because the calculation of demand factors for other classes closely follows the method used for the residential class. To the extent that problems arise with the approach used for the residential class, they will undermine the results for other classes as well.

Q. What do you conclude from this discussion?

A. The Company has failed to establish that its proposed method of applying pumpage data over the maximum month for four Chicago Metro districts to develop demand factors for customers in other districts produces accurate results. There appear to be sufficient differences between these Chicago Metro

customers and customers in other districts that call into question the use of this Chicago Metro data on a statewide basis.

Q. What does the Company assume about the relative maximum day variations for different customer classes?

A. IAWC has developed a set of percentages that present the maximum day variations for rate classes in relationship to the maximum day variation for the residential class. Based upon its 2007 Interurban demand study and prior studies, the Company assumes a maximum day variation of 85% relative to residential variation for the commercial class, and 80% for the industrial, other public authority and sales for resale classes. (IAWC Ex. 13.01 (Rev.), Table 9, p. 18.)

Q. How does this assumption impact maximum day demand factors?

A. It clearly raises the residential factors relative to other classes. For example, in the Chicago Metro district, the ratio of measured average day usage for the maximum month to average daily usage for the year is higher for the commercial class than for the residential class, i.e., 146.7% vs. 164.6% as shown in the attached Schedule 2. However, when the maximum day to average daily use ratios for the two classes are calculated using relative maximum day variations for the two classes, the residential ratio rises above the commercial ratio for the Chicago Metro district, i.e., 220% vs. 210%. (IAWC Ex. 13.01 (Rev.), Table 11, p. 20.)

Q. Do you consider these results inconsistent?

A. Yes. Measured data indicates that on a monthly basis commercial demand varies more than residential demand in the Sterling district. However, when it comes to assumptions about daily variation within the maximum month, IAWC assumes the opposite, which is that residential customers vary more. It is not clear why these two conflicting assumptions are appropriate for maximum month and maximum day usage.

Q. Should it always be assumed that the residential class will have higher variation in maximum month usage than other classes?

A. No. For one, the AWWA Manual makes quite different assumptions about the variation in class demands, stating that "[f]or residential customers, there is also likely to be some daily variation in usage throughout the maximum-month, although it is typically likely to be less than the commercial and industrial class variations." (Copyright 2000, American Water Works Association, p. 298.)

In addition, evidence provided by IAWC suggests that is not always the case. The Company provided the results for the most recent demand study using time-sensitive meters that was conducted by an IAWC affiliate. That study measured 2008 demands for customers in West Virginia and calculated the following peak day and peak hour ratios for the residential, commercial and public (one class) and industrial classes:

	Peak Day		Peak Hour	
	Non-Coincident	Coincident	Non-Coincident	Coincident
Residential	1.57	1.37	3.41	2.26
Comm. and Public	1.76	1.50	3.64	2.57
Industrial	1.88	1.17	3.66	2.02

(IAWC Response to Staff Data Request PL 3.02-R1, pp. 13-20.)

The above figures indicate it may not always be correct to assume that the ratio of peak day demands to average day demands will be higher for the residential class than other classes.

Q. Would you recommend using this recent data from West Virginia to develop demand ratios for the IAWC districts?

A. No, I would not. There is no evidence in the record to indicate that these ratios for West Virginia are relevant to IAWC customers in Illinois. However, at the same time, I find a lack of evidence in this docket to indicate that the demand patterns for the four Chicago Metro areas used to develop IAWC's proposed ratios statewide provide a reasonable basis for developing demand factors in other districts.

Staff Recommendation

Q. What do you therefore recommend for the Company's proposed maximum day demand factor methodology?

A. I recommend that the Company's methodology for developing demand factors not be used to design rates based on the evidence provided so far in this proceeding.

Q. Does your recommendation extend to the Chicago Metro district where these 2,161 residential accounts are situated?

A. Yes. There are still questions concerning the differences between measured demands for customer classes on a monthly basis and assumptions about variations in demand on a daily basis over the maximum month. As previously noted, the Chicago Metro Residential class has a lower ratio of average maximum month daily demand to average annual daily usage than the Commercial class; i.e., 146.7% vs. 164.6%. (IAWC Ex. 13.01 (Rev.), Table 7, p. 15.) Despite the fact that this monthly variation is lower for the Residential class than the Commercial class, the Company assumes that variation within the maximum month is greater for the Residential class than for the Commercial class. The Company has failed to provide sufficient evidence to support this assumption and, therefore, has failed to demonstrate the reasonableness of its proposed demand factors for the Chicago Metro district.

Q. Have you developed an alternative set of maximum day allocation factors for IAWC's districts?

A. Yes, I have developed the alternative factors presented in the attached Schedule 3.

Q. Please explain how those factors were developed.

A. They represent an effort to craft the most reasonable set of allocations based on the limited data available in this proceeding. The key factor in the development of the proposed allocators is the relationship between the variation in residential usage and the variation in pumpage levels for each district during the peak month. As I discussed previously, the Company's methodology produces daily variations in residential usage for the maximum month that in some districts exceeds the daily variation for the system as a whole. For this to be possible, on the days that residential usage is at a maximum, usage by other rate classes is below their average for the month. This would be possible on a Saturday or Sunday when many businesses and governmental offices are closed. It would not appear to be likely on a weekday when commercial, industrial and other customers are open and doing business and presumably consuming water. The problem is that IAWC does not have any clear evidence on when customer classes in the various districts peak. Therefore, the residential maximum day could be on any day of the week. In recognition of this unknown, I have devised a hybrid allocator for maximum day demands that gives an equal chance for maximum day demands to fall on any individual day of the week. If maximum demands are to fall on a Saturday or Sunday, then I assume that the Company's proposed maximum day demand factors could be representative of class demands. Therefore, I accord a 2/7ths (or 28.6%) weighting to the Company's proposed maximum day demand factors for each class. For the other 5/7ths (or 71.4%) of the allocator representing the days the residential maximum demand falls on a weekday, I have developed an alternative approach. Since businesses and governmental agencies would be open, I assume that all classes use more

water that day than their respective daily averages for the maximum month. If other customers are using more, the difference between the maximum day and average day for the maximum month cannot be greater for the residential class than the system as a whole. Thus, I have developed an allocator which allocates each district's excess over the average for the maximum month among rate classes.

Q. Please explain how the allocations are developed in that schedule.

A. I begin with Table 9 of IAWC Ex. 13.01 (Revised) (p. 18), which presents customer class variations relative to the residential class for the maximum day. I then multiply the percentage for each class by the maximum month usage for that class to develop a relative weighting by customer class. I then apply these weightings to the difference between the maximum day and average day for the maximum month that is pumped for each district. The amount allocated to each class is added to that class's average use for the maximum month to derive maximum day use for the class. These class figures comprise 5/7ths of the allocator.

Q. Do you consider this a reasonable method to derive a maximum day allocator for system costs?

A. I consider it the most reasonable approach available given the lack of data available in this proceeding. The evidence provided so far fails to present reasonable information concerning the pattern of usage by the various rate classes during the course of the maximum month for each of IAWC's districts.

Furthermore, reliance on the Company's proposed approach produces incongruous results when applied throughout the state.

I believe my alternative rests upon more reasonable assumptions about how customers consume water during the maximum month and therefore is superior to the Company's approach.

Maximum Hour Demand Factors

Q. Please explain how IAWC developed maximum hour capacity factors for the residential class.

A. The calculation is the multiple of three factors. One is the maximum day capacity factors for the residential class in each district. The second is the ratio of the system maximum hour pumpage divided by the average hour pumpage for the maximum day. The third multiple is the residential hourly variation. According to IAWC, this factor adjusts "the system's coincidental maximum hour demands to recognize that the system coincidental maximum hour demands are not equally shared by all customer classes." (IAWC Ex. 13.01 (Rev.), p. 22.)

Q. How is the residential hourly variation calculated?

A. It is calculated by dividing the non-coincident peak demands for all classes by the maximum hourly demands for each class adjusted by their maximum hour variations. These maximum hour variations seek to estimate the share of the

class peak demand that occurs at the time of system peak demand. For the residential class, the non-coincident peak is assumed to occur at the time of system peak and no variation is assumed for the class. For the commercial class, 90% of peak demand is assumed to coincide with the system peak, so the commercial peak demand is multiplied by 90%. The assumption for the remaining three classes, industrial, other public authority and sales for resale, is that 85% of the peak demand coincides with the system peak, so their peak demands are each multiplied by 85%.

The Company explains the calculation of the residential hourly variation for the Champaign district as follows. The noncoincident peak demand for the district of 49,775 is divided by the sum of 26,980 x 1.00 (residential class) plus 8,185 x 0.90 (commercial class) plus 2,816 x 0.85 plus 1,218 x 0.85 plus 7,331 x 0.85 plus 3,245 x 0.85 (industrial, other public authority and sales for resale classes). This yields a residential hourly variation of 1.0644. Thus, the Company states that “residential customers are anticipated to have a maximum hour to maximum day relationship that is 6.44 percent higher than the system’s coincidental relationship.” (IAWC Ex. 13.01 (Rev.), p. 23.)

To summarize, the residential maximum hour capacity factor for Champaign is the product of: (1) the 216.5% maximum day capacity factor for the class; (2) the system maximum hour to average hour of the maximum day ratio of 1.142; and (3) the residential hourly variation of 1.064. This yields a maximum hour capacity factor for the class of approximately 265%.

Q. How did IAWC develop its maximum hour customer class variances?

A. They are based on demand data from its last case, Docket No. 07-0507 as well as the capacity factors used in both Docket Nos. 02-0690 and 00-0340. The Company indicates that more weight was accorded to the data used in Docket Nos. 02-0690 and 00-0340 to establish class variations. (IAWC Ex. 13.0 (Rev.), p. 21)

Q. How does IAWC calculate maximum hour capacity factors for other classes?

A. They are calculated in a similar manner as the calculation of residential demands. The starting points are the respective maximum day capacity factors for remaining classes as calculated by IAWC. Those figures are then multiplied by: (1) the system maximum hour to maximum day ratio; (2) the residential hourly variation; and (3) the customer class variation for each class. The inclusion of these variations seeks to recognize that the peak demand for non-residential classes do not fully coincide with system peak demand.

Q. How do you assess the maximum hour capacity factors developed by IAWC?

A. The key problem, in my estimation is the starting point for these factors, the maximum day demand factors for each class. I have already discussed the deficiencies in these factors and found that they are not appropriate for

ratemaking in this case. The inclusion of these maximum day demands in the Company's analysis undermines the foundation for the Company's proposed maximum hour factors.

Q. What do you recommend concerning these maximum hour demand factors?

A. I recommend an alternative allocator for these costs that reflects one change from the Company's recommended approach. That is to substitute my alternative maximum day demand factors for the Company's proposed maximum day demand factors to derive maximum hour demand factors.

Q. Do you make any recommendations to the Company?

A. Yes. I recommend that the Company in rebuttal prepare a new set of maximum hour demand factors that substitute my proposed maximum day demand factors for the Company's in the calculation.

I further recommend that the Company prepare a new set of cost of service studies and rates that reflect my alternative approaches to maximum day and maximum hour demand factors.

Direct Measurement vs. Indirect Estimation

Q. Based on the evidence presented in this rate case, do you find the indirect approach preferable to direct measurement to calculate demand factors for IAWC?

A. It is preferable in some respects, less desirable in others. Clearly, it is a less costly alternative because direct measurement through the use of time-sensitive meters for a sample of customers can be a costly option. That cost is multiplied if the Company is required to separately measure demands in each of its districts as the Commission has ordered. When asked in discovery to estimate the cost of developing demand factors through the direct measurement of ratepayer demands, the Company provided a figure of $1.86 million for such an analysis. (IAWC Response to Staff Data Request PL 3.01.)

Another advantage of the indirect approach is time. Direct measurement of ratepayer demands requires installing meters before the summer starts and then collecting data until the summer season ends. In contrast, an indirect measurement can be performed at any time based on data that already exists. In this case where the Commission has encouraged the Company to produce results on an expedited basis, the indirect method offers a clear advantage.

The advantage of direct measurement (if performed correctly) is accuracy. The indirect calculations of maximum day and maximum hour demand factors presented by the Company employ judgments about the behavior of customer

classes within the maximum and maximum day that may or may not conform to reality. The most accurate way to test the validity of these judgments would require some form of directly measuring ratepayer demands.

Q. What course of action do you recommend with respect to directly measuring ratepayer demands?

A. There is a tradeoff between cost and accuracy. In the current economic environment it would be difficult to justify the additional cost of embarking on a course of directly measuring ratepayer demands to derive demand factors. That would entail adding further upward pressure on rates that have been rising for a number of years.

At the same time, the indirect methodologies presented so far in this case present problems and thereby undermine the value of the Company's cost of service study results. The lack of a viable alternative at this juncture is a reason to consider moving forward with a direct study despite the potential impact on system costs.

Q. Does this complete your prepared direct testimony?

A. Yes, it does.

Ratio of Average Daily Usage for the Maximum Month
to Average Daily Usage for the Year

Chicago Metro a/	146.7%
Pekin	135.4%
Champaign	130.1%
SPSPSB b/	130.0%
Sterling	122.3%
Lincoln	110.6%

Source: IAWC Ex. 13.01 (Revised) Table 7, p. 15)

a/ Schedule 1, p. 2 of 3
b/ Schedule 1, p. 3 of 3

Development of Minimum Maximum Day Capacity Factor
Chicago Metro Residential Class

	Residential Usage
Maximum Month	
Chicago Suburban	1,761.0
Fernway	730.8
Homer Township	3,065.2
Valley View	798.3
Waycinden	357.6
West Suburban	6,423.0
Total Chicago Metro	13,135.9
Average Month	
Chicago Suburban	1,370.7
Fernway	458.9
Homer Township	1,899.6
Valley View	533.3
Waycinden	306.8
West Suburban	4,386.6
Total Chicago Metro	8,955.9
Chicago Metro Min-Max Day Capacity Factor	146.7%

Source: IAWC Ex. 13.01 (Revised) Table 6, p. 14)

Development of Minimum Maximum Day Capacity Factor
SPSPSB Residential Class

	Residential Usage
Maximum Month	
Alton	3,186.2
Cairo	175.5
Interurban	13,876.4
Peoria	11,269.7
Streator	1,225.0
Pontiac	813.7
South Beloit	610.7
Total SPSPSB	31,157.20
Average Month	
Alton	2,622.0
Cairo	141.3
Interurban	10,312.9
Peoria	8,650.6
Streator	1,085.3
Pontiac	729.0
South Beloit	423.0
Total SPSPSB	23,964.10
SPSPSB	130.0%
Min-Max Day Capacity Factor	

Source: IAWC Ex. 13.01 (Revised) Table 6, p. 14)

Comparison of Minimum Maximum Day Capacity Factor
Chicago Metro Residential and Commercial Classes

	Residential Usage	Commercial Usage
Maximum Month		
Chicago Suburban	1,761.0	281.3
Fernway	730.8	46.0
Homer Township	3,065.2	206.6
Valley View	798.3	36.7
Waycinden	357.6	250.8
West Suburban	6,423.0	2,080.4
Total Chicago Metro	13,135.9	2,901.8
Average Month		
Chicago Suburban	1,370.7	182.8
Fernway	458.9	48.5
Homer Township	1,899.6	153.4
Valley View	533.3	24.2
Waycinden	306.8	179.0
West Suburban	4,386.6	1,174.6
Total Chicago Metro	8,955.9	1,762.5
Chicago Metro Min-Max Day Capacity Factor	146.7%	164.6%

Source: IAWC Ex. 13.01 (Revised) Table 6, p. 14)

Development of Max Day Extra Capacity Allocator
for Champaign

		Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities	Large Customers	Total
1	Max Day Variations	100%	85%	80%	80%	80%	80%	
2	Ave. Max Month Use	10,975	4,352	1,916	759	912	4,428	23,342
3	Weighted Share (line1x2)	10,975	3,699	1,533	607	730	3,542	21,086
4	Share of Total	0.52	0.18	0.07	0.03	0.03	0.17	1.00
5	System Daily Variation							1.132
6	System Max Day							26,423
7	Excess of System Max Day over Average Day Max Month (line 5x6-1)							3,081
8	Share of Excess (line 4x7)	1,604	541	224	89	107	518	3,081
9	Max Day (line 2+8)	12,578	4,893	2,140	847	1,019	4,945	26,423
10	Average Annual Use	8434	3246	1797	581	626	3374	18,058
11	Max Day Ratio (line 9/10)	149%	151%	119%	146%	163%	147%	146%
12	Alternative Max Day Extra (line 11-1	0.49	0.51	0.19	0.46	0.63	0.47	
	Development of Hybrid Allocation							
13	Company-Proposed Max Day Extra	1.15	0.90	0.35	0.65	0.65	0.85	
14	Hybrid (line 12x5/7+13x2/7) (2/7ths Company & 5/7th Alternative)	0.68	0.62	0.24	0.51	0.63	0.58	3.26
15	Average Daily Consumption	11,700	4,372	2,002	1,037	4,634	1,138	24,883
16	Total Max Day Extra (line 14x15)	7,950	2,708	473	532	2,940	655	15,259
	Proposed Max Dat Extra Allocation	0.5210	0.1775	0.0310	0.0349	0.1927	0.0429	1.0000

Sources: Exhibit 9.01
IAWC Ex. 13.01(Revised)

Development of Max Day Extra Capacity Allocator
for Chicao Metro

		Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities	Total
1	Max Day Variations	100%	85%	80%	80%	80%	
2	Ave. Max Month Use	13,136	2,902	86	366	225	16,715
3	Weighted Share (line1x2)	13,136	2,467	69	293	180	16,144
4	Share of Total	0.81	0.15	0.00	0.02	0.01	1.00
5	System Daily Variation						1.529
6	System Max Day						25,558
7	Excess of System Max Day over Average Day Max Month (line 5x6-1)						8,842
8	Share of Excess (line 4x7)	7,195	1,351	38	160	99	8,842
9	Max Day (line 2+8)	20,330	4,253	124	527	324	25,558
10	Average Annual Use	8,956	1,763	78	190	150	11,136
11	Max Day Ratio (line 9/10)	227%	241%	159%	277%	216%	230%
12	Alternative Max Day Extra (line 11-1	1.27	1.41	0.59	1.77	1.16	
	Development of Hybrid Allocation						
13	Company-Proposed Max Day Extra	1.20	1.10	0.40	1.35	0.55	
14	Hybrid (line 12x5/7+13x2/7) (2/7ths Company & 5/7th Alternative)	1.25	1.32	0.54	1.65	0.99	
15	Average Daily Consumption	11,700	4,372	2,002	1,037	4,634	23,745
16	Total Max Day Extra (line 14x15)	14,626	5,786	1,075	1,711	4,573	27,771
	Proposed Max Dat Extra Allocation	0.5266	0.2084	0.0387	0.0616	0.1647	1.0000

Sources: Exhibit 9.01
IAWC Ex. 13.01(Revised)

Development of Max Day Extra Capacity Allocator
for Lincoln

		Residential	Commercial	Industrial	Other Public Authority	Total
1	Max Day Variations	100%	85%	80%	80%	
2	Ave. Max Month Use	863	435	275	596	2,169
3	Weighted Share (line1x2)	863	369	220	477	1,930
4	Share of Total	0.45	0.19	0.11	0.25	1.00
5	System Daily Variation					1.225
6	System Max Day					2,657
7	Excess of System Max Day over Average Day Max Month (line 5x6-1)					488
8	Share of Excess (line 4x7)	218	93	56	121	488
9	Max Day (line 2+8)	1,081	528	331	717	2,657
10	Average Annual Use	781	396	257	560	1,993
11	Max Day Ratio (line 9/10)	139%	133%	129%	128%	
12	Alternative Max Day Extra (line 11-1	0.39	0.33	0.29	0.28	
	Development of Hybrid Allocation					
13	Company-Proposed Max Day Extra	0.85	0.55	0.35	0.35	
14	Hybrid (line 12x5/7+13x2/7) (2/7ths Company & 5/7th Alternative)	0.52	0.40	0.31	0.30	
15	Average Daily Consumption	996	649	363	912	2,920
16	Total Max Day Extra (line 14x15)	516	257	111	274	1,158
	Proposed Max Dat Extra Allocation	0.4456	0.2220	0.0957	0.2366	1.0000

Sources: Exhibit 9.01
IAWC Ex. 13.01(Revised)

Development of Max Day Extra Capacity Allocator
for Pekin

		Residential	Commercial	Industrial	Other Public Authority	Total
1	Max Day Variations	100%	85%	80%	80%	
2	Ave. Max Month Use	3,044	895	3,299	726	7,964
3	Weighted Share (line1x2)	3,044	760	2,639	581	7,025
4	Share of Total	0.43	0.11	0.38	0.08	1.00
5	System Daily Variation					1.014
6	System Max Day					8,076
7	Excess of System Max Day over Average Day Max Month (line 5x6-1)					112
8	Share of Excess (line 4x7)	48	12	42	9	112
9	Max Day (line 2+8)	3,093	907	3,341	736	8,076
10	Average Annual Use	2,248	674	2,922	493	6,337
11	Max Day Ratio (line 9/10)	138%	135%	114%	149%	127%
12	Alternative Max Day Extra (line 11-1	0.38	0.35	0.14	0.49	
	Development of Hybrid Allocation					
13	Company-Proposed Max Day Extra	1.20	0.85	0.45	0.90	
14	Hybrid (line 12x5/7+13x2/7) (2/7ths Company & 5/7th Alternative)	0.61	0.49	0.23	0.61	1.94
15	Average Daily Consumption	2,869	846	2,419	616	6,750
16	Total Max Day Extra (line 14x15)	1,754	414	559	375	3,102
	Proposed Max Dat Extra Allocation	0.5653	0.1335	0.1801	0.1210	1.0000

Sources: Exhibit 9.01
IAWC Ex. 13.01(Revised)

Development of Max Day Extra Capacity Allocator
for SPSPSB

		Residential	Commercial	Industrial	Other Public Authority	Other Water Utilities	Large Customers	Total
1	Max Day V	100%	85%	80%	80%	80%	80%	
2	Ave. Max M	31,157	14,750	8,528	4,405	25,005	4,832	88,678
3	Weighted	31,157	12,538	6,823	3,524	20,004	3,866	77,912
4	Share of T	0.40	0.16	0.09	0.05	0.26	0.05	1.00
5	System Daily Variation							1.134
6	System Max Day							100,561
7	Excess of System Max Day over Average Day Max Month (line 5x6-1)							11,883
8	Share of E	4,752	1,912	1,041	537	3,051	590	11,883
9	Max Day (l	35,909	16,662	9,569	4,942	28,056	5,422	100,561
10	Average A	23,964	11,250	6,405	3,037	15,612	4,081	64,349
11	Max Day R	150%	148%	149%	163%	180%	133%	156%
12	Alternative	0.50	0.48	0.49	0.63	0.80	0.33	
	Development of Hybrid Allocation							
13	Company-l Max Day Extra	1.05	0.75	0.40	0.80	0.90	0.90	
14	Hybrid (line (2/7ths Company & 5/7th Alternative)	0.66	0.56	0.47	0.68	0.83	0.49	3.68
15	Average D	31,926	14,925	13,424	4,439	10,308	9,736	84,758
16	Total Max	20,945	8,327	6,271	3,003	8,520	4,788	51,854
	Proposed I	0.4039	0.1606	0.1209	0.0579	0.1643	0.0923	1.0000

Sources: Exhibit 9.01
IAWC Ex. 13.01(Revised)