RESPONSE TO PUBLIC ADVOCATE'S INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS

PA-EXE-165. Reference the response to PA-EXE-89. Please explain the basis for using two simultaneous fires, one using 10,000 gpm and the other using 5,000 gpm. Are the use of fires of this magnitude consistent with ISO standards for water systems? Provide supporting documentation.

Response:

As indicated in the response to PA-EXE-89, the fire flow demands are consistent with prior cost of service studies and rate proceedings, which were based on the standards of the Insurance Services Office (ISO) for peak fire flow requirements. These fire flow demands are reasonable relative to the Duration of Required Fire Flow as presented in Table 15.2.6 of the National Fire Protection Association (NFPA) *Fire Protection Handbook*, 20th Edition.

Response Provided By: Ann Bui, Prabha Kumar and David Jagt, Black & Veatch

RESPONSE TO PUBLIC ADVOCATE'S INTERROGATORIES AND REQUESTS FOR PRODUCTION OF DOCUMENTS

PA-EXE-167. Reference Exhibit BV-E1, Table W-11.

a. Does the PWD agree that the maximum-day and maximum-hour system diversity factors (as calculated in Appendix A of the AWWA's M-1 Manual) associated with the class capacity factors identified on Table W-11 significantly exceed the typical range of 1.10 to 1.40?

b. If the response to subpart (a) is no, please provide the PWD's calculated maximum-day and maximum-hour system diversity factors;

c. If the response to subpart (a) is yes, please explain why it is reasonable for the diversity factors to exceed 1.40.

Response:

a. The maximum-day and maximum-hour **system** diversity factors do not exceed the typical range of 1.10 to 1.40. Please note that Table W-11 of PWD Statement 9A: Black & Veatch's Direct Testimony and Exhibits **only** reflects the units of service (demand) associated with **retail** service, and cannot be used as a basis for the development of the total **system** diversity factors.

b. The table below provides the calculation of estimated maximum-day and maximum-hour **system** diversity factors, based on the retail non-coincidental demands presented in Table W-11 and including the following adjustments:

- **Wholesale Demands**. Projected demands from service to wholesale customers should be included in the determination of the system-wide non-coincidental demands.
- **PWD Facilities.** Projected demands from PWD facilities should be included in the determination of the system-wide non-coincidental demands.
- **Fire Protection Demands.** Fire protection demands should be excluded from system non-coincidental demands. Such demands reflect design capacities and are rarely experienced on the system coincidental peak demands.
- **Non-Revenue Water.** Estimated annual volume associated with system wide non-revenue water should be included in the determination of the system-wide non-coincidental demands. The following analysis reflects the assumption that the volume of non-revenue water is a relative constant occurrence throughout the year, and is not significantly impacted by peak demands versus lower demands. Therefore, in the computation of total system non-coincidental demand, the same volume is reflected for the average day, maximum day and maximum hour demand, for the non-revenue water in the system.

Description	Avg Day Demand	Max Day Demand	Max Hour Demand
System Demands (Mcf/Day)			
Retail Demand Excluding Fire Protection	16,770	31,980	52,890
Wholesale (Aqua PA)	300	555	660
PWD Facilities	822	1,315	2,630
Subtotal Metered Demand	17,892	33,850	56,180
Estimated System Non-Revenue Water	11,201	11,201	11,201
Estimated Total System Non-Coincidental Demand	29,093	43,911	64,461
Estimated System Non Coincidental Demand Peaking Factor		1.51	2.22
System Coincidental Demand Peaking Factor		1.30	1.74
Estimated **System** Diversity Factor		1.16	1.27

c. Not Applicable.

Provided By: Ann Bui, Prabha Kumar and David Jagt, Black & Veatch