Firm Capacity and Water Allocation Analysis

Each applicant for a permit to construct or modify a public community water system must demonstrate that the proposed water system improvement, extension or connection will not exceed firm capacity, as defined below, or the water diversion limits contained in an applicable water allocation permit. An outline of the methodology used to calculate this information also appears below.

"Firm Capacity" means adequate pumping equipment and/or treatment capacity (excluding coagulation, flocculation, and sedimentation) to meet peak daily demand, as defined below, when the largest pumping station or treatment unit is out of service.

"Peak daily demand" means:

i. For modification to or extension of an existing water system, the average daily demand as recorded in the peak month of the prior five years, plus an estimation of the anticipated peak daily water demand calculated as follows:
   - Residential – Average daily demand according to DCA's Residential Site Improvement Standards (RSIS), N.J.A.C. 5:21-5.2(d);
   - Non-residential – Average daily demand according to N.J.A.C. 7:10-12.6(b), Table 1;
   - The sum of the above multiplied by a peaking factor of three (3)

ii. For a proposed new water system, an estimation of the anticipated peak daily water demand calculated for residential and non-residential development, per the above.

The Firm Capacity and Water Allocation Analysis consists of two (2) components:

1. Firm Capacity: The proposed water system has adequate firm capacity to meet all of the following:
   - Existing peak daily demand
   - Anticipated peak daily demand from both of the following –
     - Previously approved but not yet constructed DEP-permitted water main extensions or connections; and
     - Non DEP-permit water main extensions/connections committed to, but not yet completed by, the water supplier
   - Anticipated peak daily demand from the subject application.

2. Water Allocation: The applicant possesses a valid water allocation permit with sufficient monthly and annual diversion limits and/or bulk purchase agreements to meet existing and estimated demand, as follows:
   - Monthly – Average daily demand calculated for residential and non-residential development as above, multiplied by a peaking factor of 1.5, and then multiplied by 31 (days/month)
   - Annual – Average daily demand calculated for residential and non-residential development as above, multiplied by 365 (days/year)
   - The estimated peak monthly and annual demand shall be added to the respective, existing demand figures and then compared to the applicable water allocation permit limits.

Firm Capacity and Water Allocation Analysis Example

1. Calculating System/Source Firm Capacity:

System Plant	Well #	Capacity (Q)/mgd
1	1	2.0
2	2	2.0
3	3	2.0
4	4	2.4

Total System Capacity = 8.4 MGD
Firm Capacity = 6.0 MGD

2. Calculating Projected System Water Demand:

Recorded Peak Demand for Previous Five Years

	1998	1999	2000	2001	2002
Jan	74.4	71.3	71.3	77.5	77.5
Feb	70.0	67.2	72.8	75.6	64.4
Mar	89.9	96.1	93.0	89.9	93.0
Apr	102.0	99.0	102.0	99.0	105.0
May	120.9	127.1	124.0	136.4	124.0
Jun	129.0	132.0	126.0	141.0	135.0
Jul	145.7	148.8	136.4	142.6	**155.0**
Aug	142.6	151.9	147.7	139.5	151.9
Sep	132.0	132.0	145.1	132.0	135.0
Oct	117.8	111.6	114.7	114.7	108.5
Nov	96.0	96.0	105.0	102.0	90.0
Dec	74.4	77.5	83.7	80.6	80.6
Peak (MGM)	145.7	151.9	147.7	142.6	**155.0**
Total (MGY)	1,294.7	1,310.5	1,321.7	**1,330.8**	1,319.9

Outstanding Demand

Project Name	Avg. Demand (MGD)	Peak Demand (MGD)
Cape Woods Campground	0.025	0.075
Briar Cliff Mews	0.040	0.120
5-SFD subdivision	0.0018	0.0054
Total Demand	0.0668	0.2004

Current Project Demand

Project Name	Avg. Demand (MGD)	Peak Demand (MGD)
ABC Daycare	0.015	0.045

Existing Peak Demand (mgd) = 155.0/31 days = 5.000
Outstanding Peak Demand (mgd) = 0.2004
Estimated Project Peak Demand (mgd) = 0.045
Total Existing/Projected Peak Demand = 5.2454 MGD

Conclusion: Existing/Estimated Peak Demand (5.2454 MGD) < 6.0 MGD (firm capacity)

3. Water Allocation Analysis:

Current Water Allocation Permit Limits – **170.5** MGM
1,443.0 MGY

- **Formula for Calculating Peak Monthly Demand:**

  Peak Monthly + [1.5(outstanding avg. + estimated avg. project demand) x 31] =

  155 MGM (July/2002) + [1.5(0.0668 + 0.015) x 31] = **158.804** MGM

- **Formula for Calculating Annual Demand:**

  Peak Annual + 365 (outstanding avg. + estimated avg. project demand) =

  1,330.8 MGY + 365(0.0668 + 0.015) = **1,360.66** MGY