DEVELOPING SYSTEM DEMAND AND TOTAL SYSTEM LIMITS

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DEVELOPING SYSTEM DEMAND AND TOTAL SYSTEM LIMITS

- Water Resource Management Principles
- Reasonably Foreseeable Need
- System Demand Projections
- Establishment / Modification of Total System Limits

MISSION STATEMENT

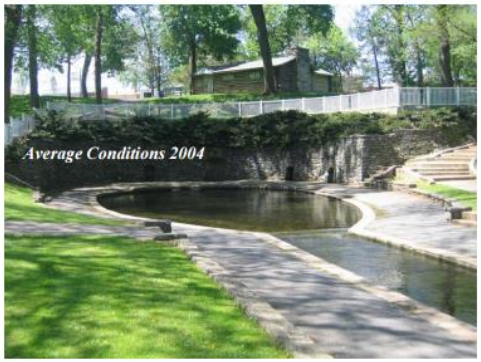
…to enhance public welfare through comprehensive planning, water supply allocation, and management of the water resources of the Susquehanna River Basin.

…to provide for the reasonable and sustained development and use of surface and ground water for municipal, agricultural, recreational, commercial and industrial purposes.

GROUNDWATER RESOURCE MANAGEMENT PRINCIPLES

GROUNDWATER MANAGEMENT PLAN
FOR THE SUSQUEHANNA RIVER BASIN

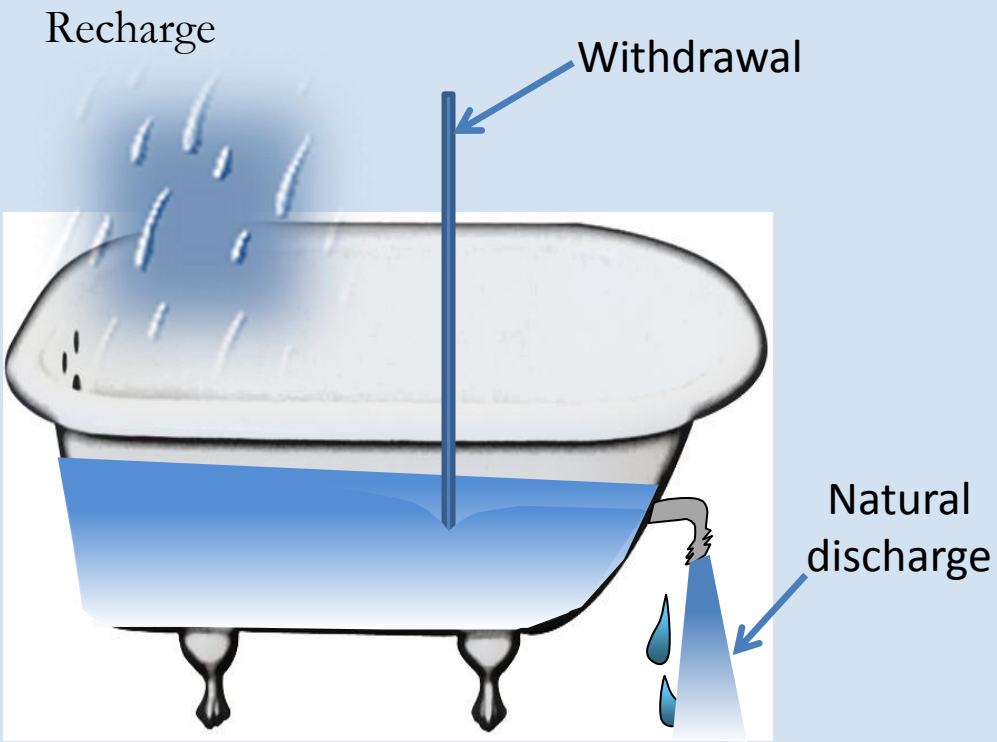
June 2005
Publication No. 236



- Groundwater management needs to promote the development, use and conservation of the basin's waters and to secure and maintain "a proper balance among industrial, commercial, agricultural, water supply, residential, recreational, and other legitimate uses of the water resources of the basin."
- The use of groundwater resources needs to be managed to promote sustainability in the face of short-term and long-term growth.
- Water resources management requires an integrated approach whereby the Commission needs to consider all of the aspects of the water resource that are fundamentally interrelated in its decision-making.

GROUNDWATER AVAILABILITY AND SUSTAINABILITY

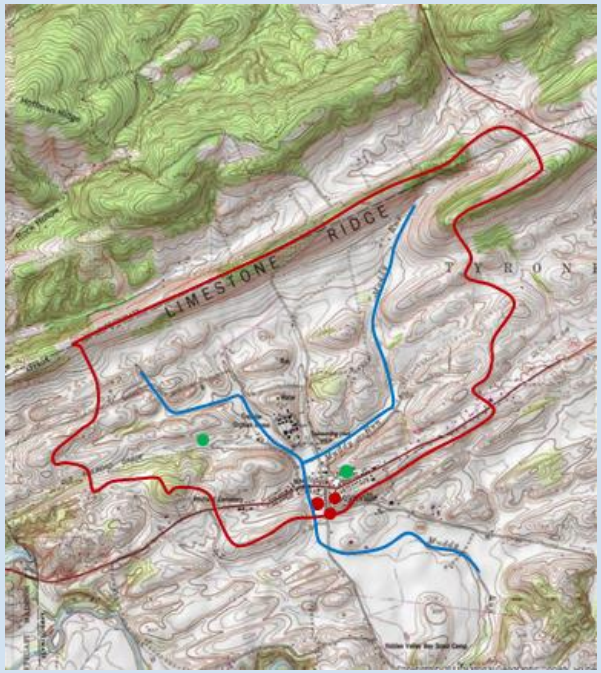
Simplified Aquifer

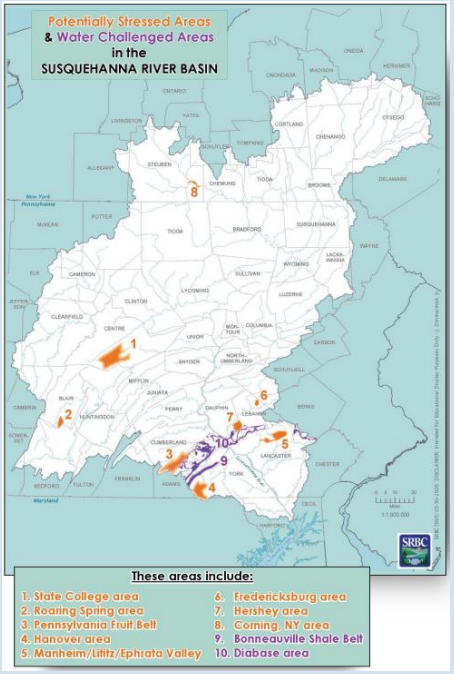


Water intercepted by a well ultimately reduces discharge to surface water

From a regulatory perspective, the Commission defines the sustainable limit of water resource development as the average annual base flow (recharge) available in the "local" watershed during a 1-in-10-year average annual drought.

GROUNDWATER AVAILABILITY AND SUSTAINABILITY





The Commission considers the cumulative effects of existing and proposed withdrawals within a watershed, and can limit approvals to ensure:

- The sustainability of the stream/aquifer system;
- A lack of adverse impacts to other users and/or the environment,
- A balance among industrial, commercial, agricultural, water supply, residential, recreational, and other uses of the water resources of the basin,
- The reasonably foreseeable need of a project sponsor

REASONABLY FORESEEABLE NEED
REGULATORY CITATIONS

The Commission can limit approvals to meet the *Reasonably Foreseeable Need* of a project sponsor

CURRENT COMMISSION REGULATIONS

§ 806.23 Standards for water withdrawals.

(a) The project sponsors of all withdrawals subject to review and approval under § 806.4, § 806.5 or § 806.6 of this part shall comply with the following standards, in addition to those required pursuant to § 806.21.

(b) *Limitations on withdrawals.* (1) The Commission may limit withdrawals to the amount (quantity and rate) of water that is needed to meet the reasonably foreseeable needs of the project sponsor.

PROPOSED RULEMAKING

11. Amend § 806.23 by revising paragraphs (b)(2) and (b)(3)(i) and adding paragraph (b)(5) to read as follows:

§ 806.23 Standards for water withdrawals.

★ ★ ★ ★ ★

(b) * * *

(2) The Commission may deny an application, limit or condition an approval to ensure that the withdrawal will not cause significant adverse impacts to the water resources of the basin. The Commission may consider, without limitation, the following in its consideration of adverse impacts: Lowering of groundwater or stream flow levels; groundwater and surface water availability, including cumulative uses; rendering competing supplies unreliable; affecting other water uses; causing water quality degradation that may be injurious to any existing or potential water use; affecting fish, wildlife or other living resources or their habitat; causing permanent loss of aquifer storage capacity; affecting wetlands; or affecting low flow of perennial or intermittent streams.

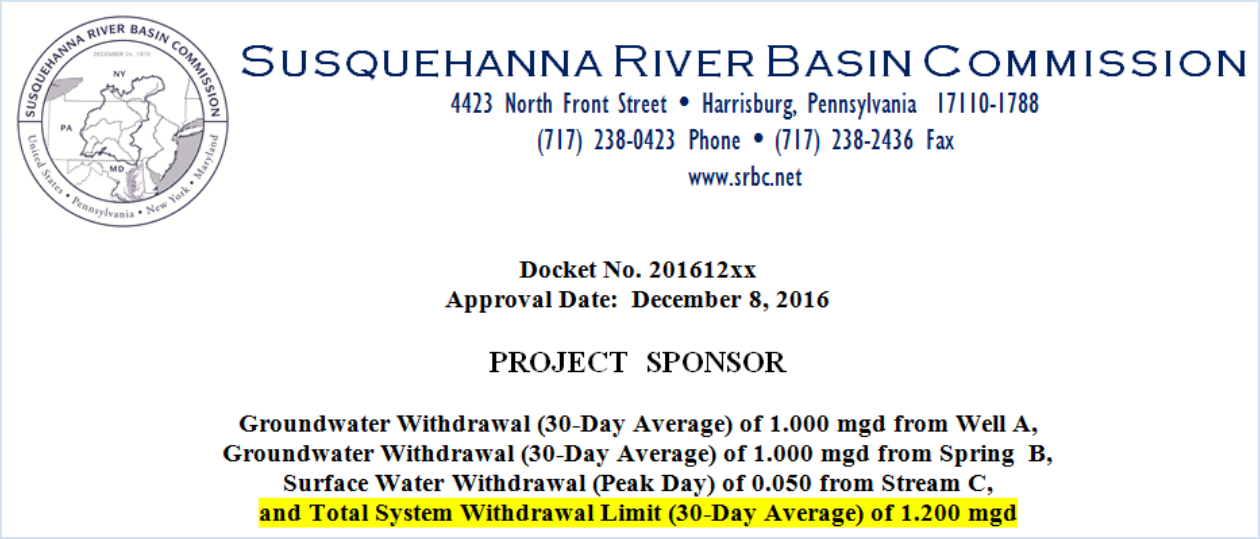
(3) * * *

(i) Limit the quantity, timing or rate of withdrawal or level of drawdown, including requiring a total system limit.

<u>Definition</u>: Reasonable projected daily water usage (demand) for the entire facility or system through the anticipated term of approval (design year) for the proposed test well.

TOTAL SYSTEM LIMITS

SRBC uses Total System Limits (TSL's) to manage the water resources of the basin by approving systems at a rate consistent with their reasonably foreseeable need.



SUSQUEHANNA RIVER BASIN COMMISSION
4423 North Front Street • Harrisburg, Pennsylvania 17110-1788
(717) 238-0423 Phone • (717) 238-2436 Fax
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Docket No. 201612xx
Approval Date: December 8, 2016

PROJECT SPONSOR

Groundwater Withdrawal (30-Day Average) of 1.000 mgd from Well A,
Groundwater Withdrawal (30-Day Average) of 1.000 mgd from Spring B,
Surface Water Withdrawal (Peak Day) of 0.050 from Stream C,
and Total System Withdrawal Limit (30-Day Average) of 1.200 mgd

TSL's are applied to all new withdrawal approvals with > 1 source.

- TSL's include: groundwater, spring, and/or surface water withdrawals
- TSL's do not include: into-system interconnects, into-basin diversions
- Redundant / backup sources encouraged

PROJECTING SYSTEM DEMAND

- Population Growth and Domestic Water Use Per Capita
- Non-Domestic Water Use

PROJECTING SYSTEM DEMAND
POPULATION GROWTH

SRBC #24P
1/96; Rev. 1/13

Susquehanna River Basin Commission

a water management agency serving the Susquehanna River Watershed

Public Water Supply Information

1. **Applicant information:**

Company Name _____

Mailing Address _____

_____

City _____ State _____ Zip _____

Contact Person _____ Title _____

Telephone (___) _____ Fax (___) _____ E-mail _____

2. **Service area population:** (Use additional sheets, if necessary.)

Name of Each Municipality or Political Subdivision in Service Area	Number of Residential Connections	Total Present Population of Municipality	Actual Population Served[1]	Projected Population Served[2]		
				5 Years*	10 Years*	15 Years* (Design Year)
Total						

* Projections should be from date of application.

[1]Provide method of computation including numbers used: _____

_____

_____

[2]Indicate source of projections and method of computation, including numbers used: _____

_____

_____

Commonwealth of Pennsylvania
Department of Environmental Protection
Population Projections Report

County Name	Municipality Name	DEP Munic Code	2000 Census	2010 Census	2020 Projected	2030 Projected	2040 Projected
ALLEGHENY	Aleppo T	02901	1,039	1,916	2,174	2,557	2,869
	Aspinwall B	02801	2,960	2,801	2,779	2,678	2,622
	Avalon B	02802	5,294	4,705	4,282	3,896	3,489
	Baldwin B	02117	19,999	19,767	18,568	17,922	16,960
	Baldwin T	02803	2,244	1,992	1,813	1,650	1,477
	Bell Acres B	02939	1,382	1,388	1,360	1,351	1,331
	Bellevue B	02118	8,770	8,370	7,995	7,606	7,225
	Ben Avon B	02804	1,917	1,781	1,621	1,475	1,321
	Ben Avon Heights B	02902	392	371	373	362	358
	Bethel Park B	02110	33,566	33,313	31,628	30,624	29,802

Population Projections:

- PADEP – State Water Plan population projections
- County planning commission projections
- Other projections / Private studies, etc.

Other Considerations:

- Service area expansion
- Zoning allowances
- ACT 537 Plans
- Probability of max buildout
- Development Grants / Other Funding

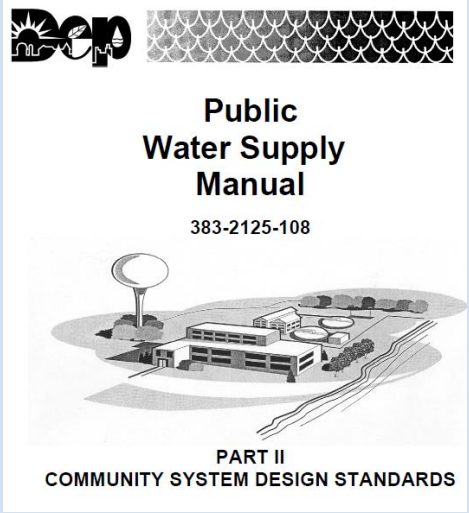
Challenges:

- 'Design Year' rarely aligns with census projections
- Growth is rarely linear; population vs. commercial growth
- Service areas rarely follow political boundaries

PROJECTING SYSTEM DEMAND
DOMESTIC WATER USE PER CAPITA

Considerations

- DEP recommended water demand data
- Current per capita water use (including):
  - Unaccounted for water
  - Community characteristics (bedroom community, agricultural, commercial, high density, etc.)



Water Demands

In calculating future average, maximum and peak water demands, consideration should be given but not limited to the following:

a. History of past water usage and conservation practices

b. Past and anticipated population growth

c. Types of industry and anticipated growth

d. Fire protection needs

e. Increasing or decreasing trends in water use

f. Water metering practices

g. Availability of municipal sewerage

h. Cost of water

i. Unaccounted for water losses

j. Minimum quantity of potable water

Recommended Water Demand Data
(In Gallons Per Day per Capita unless otherwise noted)

User Category	Demand
Residential	
Apartments	65
Boarding house, per boarder	75
Boarding house, per resident non-boarder	15
Manufactured housing spaces (per space)	150
Single family residences	75

PROJECTING SYSTEM DEMAND
NON-DOMESTIC WATER USE PROJECTIONS

PA KOZ
KEYSTONE OPPORTUNITY ZONE

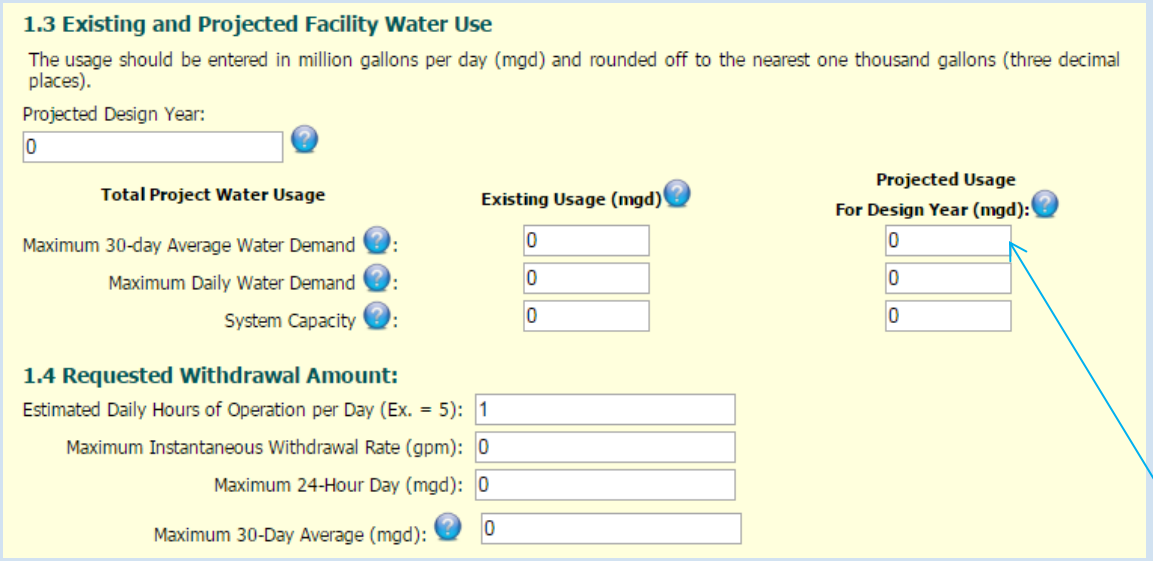
Considerations

- Zoning Allowances
- Realistic 15 year buildout
- Development Grants / Funding
- Local knowledge / Regional Trends
- Market Trends
- Bulk sales
- Industrial Development
- Regionalization / Interconnections

Total water usage: Provide data for each major category of water user for the most recent year for which data are available.

Category	Number of Metered Customers	Number of Unmetered Customers	Water Used (mgd)		Total Use (mgd)
			Metered	Unmetered	
Domestic					
Commercial					
Industrial					
Institutional					
Bulk Sales to Other Suppliers					
Municipal (municipal buildings, fire hydrants, line flushing, etc.)					
Other (identify below)					
Unaccounted-for Water					
Total System Water Use for Year ____					
mgd – million gallons per day					

SYSTEM DEMAND PROJECTIONS



1.3 Existing and Projected Facility Water Use

The usage should be entered in million gallons per day (mgd) and rounded off to the nearest one thousand gallons (three decimal places).

Projected Design Year: 0

Total Project Water Usage	Existing Usage (mgd)	Projected Usage For Design Year (mgd):
Maximum 30-day Average Water Demand:	0	0
Maximum Daily Water Demand:	0	0
System Capacity:	0	0

1.4 Requested Withdrawal Amount:

Estimated Daily Hours of Operation per Day (Ex. = 5):	1
Maximum Instantaneous Withdrawal Rate (gpm):	0
Maximum 24-Hour Day (mgd):	0
Maximum 30-Day Average (mgd):	0

Existing Usage - Based on the project's current (most recent year available) daily water usage (demand) for the entire facility or system. New projects should provide the anticipated water usage for the first year of operation.

Projected Usage for Design Year - Based on the projected daily water usage (demand) for the entire facility or system through the anticipated term of approval (projected design year listed above) for the proposed test well.

Maximum 30-day Average Water Demand - Based on a maximum consecutive 30-day average for the entire facility or system (combined daily water use from all sources).

Maximum Daily Water Demand - Based on a peak day for the entire facility or system (combined daily water use from all sources).

System Capacity - The existing system capacity should not include the desired withdrawal from the test well unless the project is new and has no existing withdrawals.

Please note: the quantity entered in the projected maximum 30-day average water demand data field will be evaluated as the potential total system limit.

STAFF EVALUATION OF REASONABLY FORESEEABLE NEED

Reasonably Foreseeable Need - Reasonable projected daily water usage (demand) for the entire facility or system through the anticipated term of approval (design year) for the proposed test well.

Staff Evaluate the submitted demand projections…

- Population projections
- Domestic Water Use Per Capita
- Non-Domestic Water Use
- Supplemental materials

…and recommend a Total System Limit

Modification of Total System Limits

Total System Limit Modifications:

- TSL's are modified during the review of each application.
  - Every expiring approval / withdrawal renewal provides the opportunity to total system limit
  - During these reviews, TSL's can be re-examined and adjusted, if appropriate, at that time.

- Project Sponsors can request a Minor Modification of the TSL at any time throughout the course of an approval should system demand increase beyond the TSL.

Example – PWS A

- PWS A - provides public water to approximately 2000 residents of Borough A and Township B in a rural county.
- Wells 1, 2, and 3 were approved by the Commission in late 1980's and early 1990's.
- Well 1 was taken out of service in the late 90's due to water quality issues. A replacement well was installed and approved in the late 2000's. In addition to the Well 1R rate limit, a system-wide limit of 0.300 mgd (30-day average) was placed on the system.
- Well 4 was installed in 2014 for redundancy and to satisfy future demand. In their 2015 Well 4 application, PWS A projected a 30-day average 15-year demand of 0.600 mgd, twice their current demand.

Example – PWS A

In support of the increased demand, PWS A detailed plans to extend their water distribution service area to a number of existing entities that currently rely on private supply wells, including:

- a university campus,
- a new electrical generation facility,
- a targeted economic development area along a highway, and
- a large institutional facility

Staff reviewed data and discussed with:

- PWS A
- County Planning Director
- Consulting Engineers and Geologists

Example – PWS A

Discussions indicated:

- Funding is currently in place to extend water service to the targeted growth area along the highway.

- By all accounts, the proposed expansion is expected to occur within approximately 3 years.

- The institutional user represents the largest single expansion for the public water supply. No definitive plans have been made to connect the user over the 15-year term of the Well 4 approval.

Other Considerations

- PWS A had an approval expiring in 3 years.

Example – PWS A

- The probability that the PWS can extend service to the institutional facility within the 15-year approval for Well 4 is not known, but it is highly unlikely that it will not occur within the next three years.

- Because PWS A will have the opportunity to revise the total system limit in 2018 when Docket No. 19881102 expires, setting the TSL at the expected 3-year demand should not:
  - result in a limitation to the expansion of the system and service area, or
  - impact the economic growth of the area.

Questions…