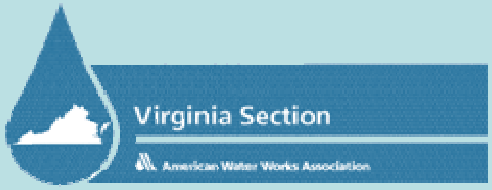
Virginia's New Water Supply Planning Regulation

WATER DEMAND PROJECTIONS & SAFE YIELD



Presented By:
JOE HASSELL ENVIRONMENTAL PROGRAM MANAGER,
VIRGINIA DEQ OFFICE OF WATER SUPPY PLANNING

March 28, 2007

INTRODUCTION

- Water Demand Projection Requirements in State Planning and Permitting Regulations
- Typical methods
- Examples
- Safe Yield, VDH Definitions for Rivers and Reservoirs, Water Planning and Permitting Requirements

Projections - Planning Regulation Requirements

Population…should be estimated according to information from the U.S. Census Bureau, Bureau of Economic Analysis, the Virginia Employment Commission, or other accepted source of population information, including but not limited to, local or regional sources. Demand projection methodologies should be consistent with those outlined in the American Water Works Association or American Society of Civil Engineers manuals.

Permit Regulation Requirements

Information on the proposed use of and need for the surface water and information on how demand for surface water was determined.

If during the water supply planning process, the need for the withdrawal was established, the applicant may submit said planning process information. The board shall deem such a submittal as meeting the requirements of this subsection. (see also 9 VAC 25-780-100 and 9 VAC 25-780-130.)

Where to use Gross Per Capita

- As a check for other more sophisticated analyses
- For small or medium sized towns
- For systems in which the majority of the populations is publicly supplied
- For systems where sophisticated analysis is not required, i.e. no immediate water needs

Sample Gross GPCD values

• Covington	426
• Danville	140
• Emporia	186
• Radford	143
• Salem	147
• Staunton	175
• Williamsburg	262
• Richmond	148
• Winchester	279
• Farmville	135
• Front Royal	131
• Manassas	286
• Orange	142
• South Boston	216
• Strasburg	175

Trends

- Where to use
  - As a check of other methodologies
  - As graphical illustrations of what has been and what might be according to various methodologies.

Disaggregated Methodologies

Typical Categories

- Residential/ Domestic
- Commercial, institutional, light industrial
- Industrial
- Military
- Unaccounted for losses

Typical Formularies

Residential = Population Served × GPCD
Typically 65 gpcd, ranges from 40 to 80

Commercial and Industrial
Typical 40 gpcd ranges 10 – 75

Public Uses
Typical 20 gpcd, ranges 60-100

Losses
Typical 20 gpcd, ranges 15-25 gpcd or 10% to 20% of Total Use.

Comprehensive Plan Methodologies

- Use land use types, area and water use coefficients to predict water use.
- Often do not show growth in water use over time but forecast build out water use.

Previously Used Coefficients GPAcre

Community Residential	1000
Community Commercial	2000
Light Industrial	2000
Heavy Industrial	3500
Village Mixed Use	1500
Public Institutional	600
Commercial	1300
Heavy Industrial	4500
Retail Business	674
Other Commercial	2514

Area Based Coefficients (Cont.)

Commercial	1000
Office	2000
Light Industrial	1500
Heavy Industrial	4500
Institutional	1000

Hybrid Methodologies

- Collection of Different Assumptions
- Often found in regional plans and projects where each locality has its own methodology
- Usually use some variations of disaggregation and comprehensive plan methodologies
- Sometimes use existing use as a base and use various unique assumptions regarding future growth

Safe Yield

Undefined by planning regulation but requires "*the name of the reservoirs, the sub-basins in which the reservoirs are located, the drainage area, the amount of on-stream storage available for water supply, the design capacity for average daily and maximum daily withdrawals from the reservoirs, the safe yield of the reservoirs,*" and

Planning Regulation Requirements Continued

For stream intakes, "*the name of the stream or river, the drainage area of the intake, the sub-basin in which the intake is located, the design capacity for average daily and designed maximum daily withdrawal from the stream, the safe yield, the lowest daily flow of record* "

Safe Yield River Intakes

- VDH definition is “the minimum withdrawal rate available during a day and recurring every 30 years (30 year - one day low flow).
- Competing users (2 withdrawals from the same stream cannot both safely take the 1Q30)
- DEQ periodically updates 1Q30 of all gages and accepts safe yield determination based upon drainage area adjustments
- Must consider regulated streams

Safe Yield Complex Intakes

- VDH definition is “the minimum withdrawal rate available to withstand the worst drought of record in Virginia since 1930.”
- Moving Target, (if 2002 drought is worse than previously used droughts, then the safe yield decreases)
- DEQ has updated 1985 Safe Yield publication for some simple systems using data from the 2002 drought

What we watch for

- We check reported drainage areas
- We check reported water supply storage vs. previously reported water supply storage
- We review sources that are declared obsolete to see if they really are obsolete
- We review operational assumptions to see if they make sense.
- We review risk levels to see if they make sense

Conclusion

§62.1-11.E

State Policy as to Waters

The right to the use of water or to the flow of water in or from any natural stream, lake or other watercourse in this Commonwealth is and shall be limited to such water as may reasonably be required for the beneficial use of the public to be served;

Reasonableness is a subjective term

- DEQ Planning and Permitting Regulations are flexible with regard to methodology but require documentation of assumptions
- DEQ reviews assumptions and compares them with readily available independent information in assessing whether the assumptions are reasonable.

Questions?