Developing New Streamflow Regulations in Connecticut

November 24, 2009

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Director of Water Resources
The Connecticut Water Company
Connecticut Water Company

- Organized in 1956
- 60 Systems
- 54 Towns
- 300,000 people
- NASDAQ - $60 M in Revenues
CWC Overview – Regulatory Oversight

- Environment
  - 18 Active Reservoirs, 87 wellfields
  - 50 MGD
  - DEP – Permits & Registrations

- Public Health
  - DPH – Purity & Adequacy of Supply

- Public Service
  - Public Utility Control – Service & Rates
Water Utilities Have Long Been Stewards of the Environment

Support Efforts to Protect Water Resources of the State – 80% of Residents Served
Proposed Stream Flow Standards and Regulations
Public Notice, October 13, 2009

The Regulations of Connecticut State Agencies are amended by adding sections 26-141b-1 to 26-141b-9, inclusive, as follows:

(NEW) Section 26-141b-1. Short title. Sections 26-141b-1 to 26-141b-9, inclusive, shall be known as the department’s Stream Flow Standards and Regulations.

(NEW) Sec. 26-141b-2. Definitions. As used in sections 26-141b-1 to 26-141b-9, inclusive, of the Regulations of Connecticut State Agencies:

1. “Anadromous” means a species of aquatic life that spawns in freshwater and migrates to salt water to complete its life cycle as an adult;

2. “Antecedent period” means the fourteen consecutive days immediately preceding the date the required release is calculated pursuant to section 26-141b-6(a)(3) of the Regulations of Connecticut State Agencies;
Streamflow – Existing & Future

- **Existing Minimum Flow Standards**
  - Dams on Stocked Watercourses
  - Unchanging Daily Flow Release

- **Proposed Streamflow Regulations**
  - Apply to all rivers and streams
  - Be based on natural variations of flow
  - Preserve and protect natural aquatic and stocked wildlife and promote usage for recreation
  - Provide for public health... public utilities, water supply...
Potential Benefits of New Streamflow Regulations...

- More Water in Streams
- Improved Stakeholder Relationships
- Relief from CEPA Claims
- Guidance for Future Diversions
- Improved Land Use Decisions
Major Components of Proposed Regs

- Stream Classifications 1 – 4
- Reservoir Release Requirements
- Groundwater Withdrawal Limits
- Flow Management Plans with Stakeholders as a Compliance Alternative
Implementation

Stream Flow Proposal

<table>
<thead>
<tr>
<th>Classification Year 0 - 5</th>
<th>Interim Compliance Year 6 - 11</th>
<th>Full Compliance Year 11 - 16</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consider Factors Indicative of the Degree of Human Allocation of Natural Stream Flow</td>
<td>Class 2 - release 75% of natural inflow Class 3 - emissions per License Level Release Rule</td>
<td>Class 2 - release 75% of natural inflow Class 3 - Release per Multi-Level Release Rule</td>
</tr>
<tr>
<td>Adopt Stream Flow Classifications</td>
<td>Class 4 - greater than 0.1 cfs as existing stream flow</td>
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</tr>
<tr>
<td>Prepare Stream Flow Classifications, Public Notice, and Solicit Comment</td>
<td>Data Reporting</td>
<td>Data Reporting</td>
</tr>
<tr>
<td>If Classification Change Proposed, 60 day comment period</td>
<td>Look at diversions in basin cumulatively Operate diversion such that</td>
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</tr>
<tr>
<td></td>
<td>Class 1 - maximum is 0.25 x 0.05 x F</td>
<td>Class 1 - maximum is 0.25 x 0.05 x F</td>
</tr>
<tr>
<td></td>
<td>Class 2 - maximum is 0.50 x 0.05 x F</td>
<td>Class 2 - maximum is 0.50 x 0.05 x F</td>
</tr>
<tr>
<td></td>
<td>Class 3 - maximum is 1.00 x 0.05 x F</td>
<td>Class 3 - maximum is 1.00 x 0.05 x F</td>
</tr>
<tr>
<td></td>
<td>Class 4 - existing practice</td>
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</tr>
<tr>
<td></td>
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</tbody>
</table>

Approved Watershed Based Plans

Diversion Permit

Run of River Dams, Dams with Watersheds < 3 Square Miles, Reservoirs in Series

Diversions Not Requiring Permit, Tidal Rivers, Public Safety Withdrawals
Conceptual Model for Stream Classification

Class 1 - Natural Flow
Class 2 - Near Natural Flow
Class 3 - Ecologically Sufficient Flow
Class 4 - Substantially altered by human activity as necessary to provide for the legitimate needs of public health...public utilities, water supply...
Classification Process

- 5 Year Process by Major Basins
- Based on Relative Conditions of Streams and Future Use
- Required Flow Releases and Groundwater Withdrawals Based on Classifications
- Extent and Timing of Releases and Withdrawal Limits Impact Ability to Supply Customers and the Communities We Serve
## Compliance

### Table: Minimum Required Release

<table>
<thead>
<tr>
<th>Bioperiod</th>
<th>Effective Date</th>
<th>Minimum Required Release</th>
<th>Dry Period Release</th>
<th>Wet Period Release</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overwinter</td>
<td>Dec 1 – Feb 28</td>
<td>Bioperiod Q95</td>
<td>Bioperiod Q75</td>
<td></td>
</tr>
<tr>
<td>Habitat Forming</td>
<td>Mar 1 – Apr 30</td>
<td>Bioperiod Q95</td>
<td>Bioperiod Q75</td>
<td></td>
</tr>
<tr>
<td>Clupeid Spawning</td>
<td>May 1 – May 30</td>
<td>Bioperiod Q95</td>
<td>Bioperiod Q75</td>
<td></td>
</tr>
<tr>
<td>Resident Spawning</td>
<td>Jun 1 – Jun 30</td>
<td>Bioperiod Q90</td>
<td>Bioperiod Q75</td>
<td></td>
</tr>
<tr>
<td>Rearing and Growth</td>
<td>Jul 1 – Oct 31</td>
<td>Bioperiod Q80</td>
<td>Bioperiod Q50</td>
<td></td>
</tr>
<tr>
<td>Salmonid Spawning</td>
<td>Nov 1 – Nov 30</td>
<td>Bioperiod Q90</td>
<td>Bioperiod Q75</td>
<td></td>
</tr>
</tbody>
</table>

### Notes:

- "F" represents the ratio of bioperiod Q99 to Rearing and growth bioperiod Q99 at site.
- Data Reporting:
  - Look at diversions in basins cumulatively.
  - Operate diversions such that:
    - Class 1: meet attraction to 0.25 x Q99
    - Class 2: meet attraction to 0.25 x Q99 x F
    - Class 3: meet attraction to 0.25 x Q99 x F
    - Class 4: existing practice

## Release Rule Example

<table>
<thead>
<tr>
<th>Bioperiod</th>
<th>Dates</th>
<th>Release Rate (cfsm)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Dry Period</td>
<td>Wet Period</td>
</tr>
<tr>
<td>Overwinter</td>
<td>Dec. 1 - Feb. 28</td>
<td>0.46</td>
<td>1.10</td>
</tr>
<tr>
<td>Habitat Forming</td>
<td>March 1 - April 30</td>
<td>1.05</td>
<td>1.71</td>
</tr>
<tr>
<td>Clupeid Spawning</td>
<td>May 1 - May 30</td>
<td>0.52</td>
<td>1.05</td>
</tr>
<tr>
<td>Resident Spawning</td>
<td>June 1 - June 30</td>
<td>0.24</td>
<td>0.40</td>
</tr>
<tr>
<td>Rearing and Growth</td>
<td>July 1 - October 31</td>
<td>0.08</td>
<td>0.28</td>
</tr>
<tr>
<td>Salmonid Spawning</td>
<td>Nov. 1 - Nov. 30</td>
<td>0.24</td>
<td>0.62</td>
</tr>
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</table>

Flow changes on 1\textsuperscript{st} and 15\textsuperscript{th} of each month

Extensive Monitoring and Variability
Reservoir Release Drought Cutbacks

<table>
<thead>
<tr>
<th>Drought Trigger</th>
<th>Stream Flow Release Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Advisory</td>
<td>100% of Base Flow</td>
</tr>
<tr>
<td>Watch</td>
<td>50% of Base Flow</td>
</tr>
<tr>
<td>Warning</td>
<td>25% of Base Flow</td>
</tr>
<tr>
<td>Emergency</td>
<td>No release required</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>All other Bioperiods</td>
</tr>
<tr>
<td></td>
<td>75% of Base Flow</td>
</tr>
<tr>
<td></td>
<td>50% of Base Flow</td>
</tr>
<tr>
<td></td>
<td>25% of Base Flow</td>
</tr>
<tr>
<td></td>
<td>No release required</td>
</tr>
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</table>

Base Flow = “Dry” Period Release

Defining drought triggers important — Must be adequate without being too frequent
Groundwater Allowed Withdrawal
Applied to existing and new sources

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<tr>
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<th>Class 1</th>
<th>Class 2</th>
<th>Class 3</th>
</tr>
</thead>
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<tr>
<td>Overwinter</td>
<td>Dec 1 – Feb 28</td>
<td>0.05 x Q99</td>
<td>0.25 x Q99 x F</td>
<td>0.50 x Q99 x F</td>
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“F” represents the ratio of bioperiod Q99 to Rearing and growth bioperiod Q99 at site

Q99 = Flow equaled or exceeded 99% of the time (≈7Q10).
Compliance on Class 4 Streams

- **Reservoirs**
  - 0.1 cfsm or Current Release Rule

- **Groundwater**
  - Continue Unaffected

- **Flow Management Plan**
Flow Management Plans

- **Adopted by DEP**
  - Public process

- **Include all structures subject to Standards**

- **Include BMPs to minimize flow alteration**
  - Conservation
  - Demand management

- **Include compliance plan**

- **Expensive**

- **Uncertain**
Compliance Requirements for Public Water Suppliers

- Dam Modifications
- Release Monitoring
- Distribution System Modifications
- Increased Treatment Needs
- New Source Development
- Flow Management Plans
- Conservation/Demand Management
Potential Public Water System Impacts

- **System Specific**
- **Loss of Available Supply**
  Reservoir Safe Yield / Well Capacity – especially during summer months
- **Water Quality & Aesthetics**
- **Capital and O&M Costs**
- **Frequency & Duration of Requests to Customers for Use Restrictions**
  - Operating Revenue Implications
Potential Impacts on Customers and Local Communities

- Increased Frequency and Longer Duration of Water Use Restrictions
- Moratoriums
  - Wholesale – Between Utilities to Address Regional Issues
  - Routine Development – Residential, Commercial, Industrial, Public Authority
- Increased Rates for Water Service and Fire Protection
- Impact on Economic Development and Recovery
Impacts on Municipalities

- Unfunded Mandate on Cities and Towns
  - Compliance costs for municipal water departments
  - Compliance requirements for non-PWS dams
- Limits Ability to Plan

Impacts on Business & Industry

- Direct – Compliance
- Indirect – Customer
Implementation Questions?

Compliance

- Will compliance cause conflicts with other (DPH, DPUC, OCC) regulatory obligations?
- Are alternative supplies available?

Public Policy

- Is significant uncertainty and risk in our public water systems acceptable – and to what degree?
- At what cost would we be implementing these regulations and to what end?
Want to Ensure New Streamflow Regulations

- Adequately balance environmental, public health and safety, and economic interests
- Meet the needs of the residents of the state
Need to Find Appropriate Balance

- These are important regulations but there is still more work to do before they can be adopted.
- We stand ready to work with stakeholders and policymakers to develop balanced regulations.
- Must meet the mandate of the law and the needs of the residents of Connecticut.
Balancing Environmental & Other Interests

- Conduct cost-benefit analysis
- Identify appropriate exemptions or special conditions to minimize impacts on water supplies, customers and the communities served
- Identify equitable cost distribution so not all expenses borne by water utility customers
- Develop appropriate implementation process that prioritizes needs and allows for extensive phase-in for compliance
Schedule

- Public Hearing
  January 21, 2010
- Hearing Officer Report
- Revisions are Possible
- AG Review for Legal Sufficiency Determination
- Regulations Review Committee

Outcome Uncertain
Questions?