Rockland County Drought Update

Samuel Rulli, Rockland County Department of Health
Water Task Force Meeting
September 22, 2016
Regulatory Overview

- **Article V of the Rockland County Sanitary Code**
  - Gives the Rockland County Commissioner of Health the authority to declare water supply emergencies and enforce mandatory water use restrictions.
  - Establishes limits/triggers related to rainfall and storage that are used to base declaration decisions.
  - Specifies 5 stages of drought/emergency levels that have their own triggers and water use requirements.
  - Specifies water use restrictions that are enforceable once declared.
  - Gives flexibility to the Commissioner in both the timing of declaration and conditions on requirements.
Five Stages of Drought

- Stage 1 - Drought Watch (in effect 8/24/16 to present)
- Stage 2 - Drought Alert (in effect 7/21/16 to 8/24/16)

NOTE: Stages 1 through 2 target reductions in water usage and cutting out non-essential outdoor watering. These restrictions try to avoid loss of property/investments from community. Stages 4 through 5 are more serious situations where virtually all outdoor watering is required to stop to reduce demands and is less sensitive to financial impact.

- Stage 3 - Drought Warning
- Stage 4 - Drought Emergency
- Stage 5 - Severe Drought Emergency
Drought Triggers

- DOH Staff closely watch 3 indicators to evaluate the status of the counties water supply. The data needed are provided via routine reporting from Suez NY.
  - Rainfall data from a gauge at Lake Deforest.
  - Water storage levels in Lake Deforest.
  - Water storage levels for augmentation of Ramapo River
    - Potake Pond, in Sloatsburg, is used to augment flow in the Ramapo River.
    - Ramapo Valley Well Field usage is limited base on stream flow. Flow measured by USGS gauge downstream of well field and production limits enforced by NYSDEC.
    - If flow in Ramapo River drops below 8 mgd the well field must be shut down.
    - (Maybe move these to slide after review each drought trigger)
Rainfall Triggers

Rainfall Totals by Drought Stage (thru 8/16)

<table>
<thead>
<tr>
<th>Inches</th>
<th>20 Year Avg</th>
<th>Current</th>
<th>% Below Avg</th>
<th>Trigger %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 Month Total (Stage I)</td>
<td>8.40</td>
<td>8.46</td>
<td>-0.7</td>
<td>&gt; 40</td>
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<tr>
<td>3 Month Total (Stage II)</td>
<td>11.96</td>
<td>10.25</td>
<td>14.3</td>
<td>&gt; 40</td>
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<tr>
<td>4 Month Total (Stage III)</td>
<td>15.67</td>
<td>13.60</td>
<td>13.2</td>
<td>&gt; 40</td>
</tr>
<tr>
<td>6 Month Total (Stage IV)</td>
<td>21.95</td>
<td>17.16</td>
<td>21.8</td>
<td>&gt; 40</td>
</tr>
<tr>
<td>12 Month Total (Stage V)</td>
<td>41.90</td>
<td>36.76</td>
<td>12.3</td>
<td>&gt; 35</td>
</tr>
</tbody>
</table>

12 Month Precipitation @ Lake DeForest Plant

*20 Year Average (1959-1979)   2016 Monthly Rainfall*
Lake Deforest Storage TriggerS

2015 - 2016 DeForest Lake Reservoir Storage

Actual  NYDEC Rule Curve  RGDOH Rule Curve A  20 Year Avg  20 Year Min
2015-2016 Ramapo River Augmentation Supply

- Total Available
- Stage I
- Stage II
- Stage III
- Max Storage
Ramapo Augmentation Storage

- Potake Pond, in Sloatsburg area, is used to augment flow in the Ramapo River.
- Usage regulated by NYSDEC. Controls on minimum levels in WSA.
- Ramapo Valley Well Field usage is limited based on stream flow. Flow measured by USGS gauge downstream of well field and production limits enforced by NYSDEC.
- If flow in Ramapo River drops below 8 mgd the well field must be shut down.
- There are other PIP waters that can be used, but at discretion of PIP.
Rockland’s Drinking Water Supply

Estimated Annual Average Supply

- UWNY - Deforest
- UWNY - Letchworth
- UWNY - Ramapo Vally Wells
- UWNY - System Wells
- Nyack Water
- Suffern Water
- Private/Small Public Wells

Pie chart showing distribution of water supply:
- Ramapo Well Field

### Suez NY Supply Capacity

<table>
<thead>
<tr>
<th>Source of Supply</th>
<th>Annual Average Capacity (mgd)</th>
<th>Maximum Day Capacity (mgd)</th>
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<tbody>
<tr>
<td>System Wells</td>
<td>16.49</td>
<td>25.03</td>
</tr>
<tr>
<td><strong>Ramapo Well Field</strong></td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Lake DeForest WTP</td>
<td>10</td>
<td>20</td>
</tr>
<tr>
<td>Letchworth WTP</td>
<td>1</td>
<td>3</td>
</tr>
<tr>
<td><strong>Subtotal</strong></td>
<td><strong>34.49</strong></td>
<td><strong>52.03</strong></td>
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</table>

Seasonal Month Capacity?
Concerns and Response

Concerns

- Loss of Potake Storage >> Loss of Ramapo Well Field >> Unable to meet peak demands and/or sustained seasonal average demand
- Potential water outages, low water pressure, lack of water for fire protection
- Recognized that mandatory restrictions would likely not slow down or stop the potential loss of Potake Storage and ability to produce water from Ramapo valley.

Actions Taken by DOH

- Declaration of Stage 2
- Preparation for Stage 3 if needed
- Routine communication with Suez, NYSDEC, and NYSDOH to assess and explore other options.
  - Alternate sources
  - Relief on state permit restrictions
Stage 2 Implementation

- Received excellent media coverage from the July 21, 2015 declaration. Picked up by many local and regional outlets.
- Website and social media were used to get message out. DOH phones were still overwhelmed with calls. Revisions were made to clarify points of confusion.
- Flexibility in declaration was used to impose irrigation limited to 2 times per week to reflect current best practices in replace of alternate day watering that is specified in the code.
- Variance applications were accepted for plantings/new lawns installed within a specified time period. Approximately 60 waiver applications were filed and processed.
- Complaints were directed to an online system. Approximately 65 complaints were received.
- Significant DOH resources were diverted from other duties/programs to handle demands.
Did it work?

Water Usage in Suez System

- **Stage 2 Declared**
- **Dropped to Stage 1**
## Monthly Average Demand

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<tr>
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<tbody>
<tr>
<td>January</td>
<td>27.47</td>
<td>26.30</td>
<td>26.17</td>
<td>27.32</td>
<td>26.88</td>
<td>25.23</td>
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<tr>
<td>February</td>
<td>27.56</td>
<td>26.02</td>
<td>26.02</td>
<td>27.63</td>
<td>28.45</td>
<td>25.15</td>
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<tr>
<td>March</td>
<td>26.64</td>
<td>25.53</td>
<td>25.53</td>
<td>27.30</td>
<td>28.81</td>
<td>25.08</td>
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<tr>
<td>April</td>
<td>27.02</td>
<td>27.63</td>
<td>27.63</td>
<td>26.59</td>
<td>27.16</td>
<td>25.64</td>
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<tr>
<td>May</td>
<td>28.72</td>
<td>28.23</td>
<td>28.23</td>
<td>27.83</td>
<td>32.05</td>
<td>28.21</td>
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<td>June</td>
<td>34.67</td>
<td>31.16</td>
<td>31.16</td>
<td>31.54</td>
<td>30.88</td>
<td>34.44</td>
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<tr>
<td>July</td>
<td>35.85</td>
<td>34.36</td>
<td>34.36</td>
<td>31.91</td>
<td>32.62</td>
<td>33.98</td>
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<tr>
<td>August</td>
<td>31.13</td>
<td>31.83</td>
<td>31.83</td>
<td>32.49</td>
<td>35.15</td>
<td>31.25</td>
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<tr>
<td>September</td>
<td>29.84</td>
<td>29.08</td>
<td>29.08</td>
<td>31.19</td>
<td>33.00</td>
<td></td>
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<tr>
<td>October</td>
<td>27.31</td>
<td>25.57</td>
<td>25.57</td>
<td>26.72</td>
<td>27.20</td>
<td></td>
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<tr>
<td>November</td>
<td>26.88</td>
<td>25.84</td>
<td>25.84</td>
<td>25.90</td>
<td>24.92</td>
<td></td>
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<tr>
<td>December</td>
<td>26.35</td>
<td>25.36</td>
<td>25.85</td>
<td>26.17</td>
<td>24.11</td>
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</tr>
</tbody>
</table>

Suez Water New York
Questions and Issues

- This event was due to low streamflow in the Ramapo, more than low rainfall in the county. Drought or potential emergency?
- Questions raised about the reliability of the Ramapo Valley Well Field.
- Questions raised about the ability of water system in to handle moderately high sustained seasonal demands.
- Difficult to determine to what extent mandatory restrictions helped in reducing demand. Periodic precipitation may have been the primary contributor.
- Feedback from the other side
  - Residents and businesses that object to the restrictions.
  - Those on wells that don’t feel restrictions should apply to them.
  - Loss of income from landscaping industry.
- Confusion caused with differences in declared requirements and code specifics.
- Variances process takes significant time with little return on desired goal.
- Logistical issues with code applicability for some requirements.
Next Steps

- Perform more detailed after action assessment once declaration is lifted.
- Identify potential code changes to help with implementation.
  - Remove outdated/unworkable components.
  - Adapt to current best practices.
  - Consider expanding flexibility of Commissioner.
- Begin discussing and evaluating the reliability of the Ramapo Valley Well Field and potential implications of seasonal average limitations.
- Better modeling and understanding of Ramapo River needed.