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May 8, 2015

To: Environmental Services Commission
From: Doug Lane, P.E. Water & Sewer Systems Senior Engineer
Subject: Water System Plan Update

Action Required at this Time

Staff will continue discussion of draft Water System Policies, focusing specifically on the policy for Drinking Water Storage for Emergency Supply Outages. No formal action by the Commission is required at this time, although we do encourage your questions and input for consideration as we develop the draft Water System Plan, which includes the Water System Policies.

Background

The Washington State Department of Health (DOH) requires water storage for operational, equalizing, fire and standby purposes. Standby storage is intended to temporarily serve customers in a water supply emergency.

DOH generally recommends standby storage volume based on a formula of two days of average water usage, minus a volume credit where there are multiple water sources. If community expectations are amenable to one average day of service instead of two days, DOH allows for a minimum of one day. DOH also allows water utilities to “nest” fire and standby storage, counting the same volume available for both needs, effectively reducing standby storage to 1-day minus fire storage.

Bellevue's longstanding practice has been to provide at least the 1-day storage minimum (200 gal/ERU) recommended by DOH, plus also provide separate fire storage.

As part of the Water System Plan update, Bellevue hired Carollo Engineers, Inc. to compile an industry survey of storage criteria used by other utilities locally, regionally and nationally. Carollo's assessment indicates that Bellevue's criterion for standby storage is generally consistent with industry norms.

Bellevue staff also reviewed standby storage criteria published by adjacent utilities, as shown in Table 1.

Table 1 – Adjacent Utility Standby Storage Criteria

<div> <div>Less Storage</div> <div>←</div> <div>→</div> <div>More Storage</div> </div>		
1-Day “Nested” with Fire: <ul style="list-style-type: none"> • Renton • Issaquah (Cascade areas) 	1-Day (Fire Storage Separate): <ul style="list-style-type: none"> • Bellevue • Coal Creek Utility District • Kirkland 	2-Days (some Nesting w/Fire): <ul style="list-style-type: none"> • Redmond • Issaquah (well-only areas)

Seattle Public Utilities' (SPU) storage analysis does not consider a complete shutoff of all water supplies because such "extreme events... have a very low probability of occurrence".¹ SPU instead performed modeling of the regional supply system during 3 separate emergency events (Tolt supply outage, Cedar supply outage, or a regional power outage), and determined that in any of those events, SPU could supply sufficient water for indoor water usage to all customers (retail and wholesale) uninterrupted for at least 5-days.

¹ SPU 2013 Water System Plan, Appendix C-7 "System Storage Level of Reliability". June 2012.

The risk of a water supply emergency to Bellevue is mitigated by the presence of two independent sources: the Tolt and Cedar River watersheds. In addition, there is significant regional system storage nearby (SPU’s Eastside Reservoir), which benefits Bellevue disproportionately due to its location. Finally, Bellevue has legacy water rights that allow for development of independent emergency well supplies, which could provide some water perpetually in a water supply emergency.

Table 2 lists generalized costs and benefits of potentially increasing standby storage to 2-days of average water usage, based on 26 million gallons additional storage needed over 20-years (by 2034).

Table 2 – Impacts vs. Benefits for Increasing to 2-Day Standby Storage

Benefits of Increasing Standby Storage from 1-Day to 2-Days	Impacts of Increasing Standby Storage from 1-Day to 2-Days
<ul style="list-style-type: none">• Additional 24-hours of water in the event of a complete supply outage	<ul style="list-style-type: none">• ≈\$90M cost (26 MG @ \$3.5/gal) for reservoir construction, engineering, permits, etc.• ≈\$40M+ for land acquisition (@ \$2M/acre)• Water quality degradation & increased water age (chlorine decay, disinfection by-products)• Additional cost for pumping and transmission capacity, depending on reservoir locations• Community impacts (construction, views, etc)• Increased O&M (approx. 2 FTEs)• Potential Property condemnation

Discussion

Commission input is important to ensure the Water System policies guide water system operations appropriately over the next planning period. The City Council appreciates a thorough vetting of policy issues by ESC before the recommendations are brought forward for their approval.

Considering the negative community impacts, water quality considerations, capital costs and ongoing maintenance requirements of additional storage, and multiple water supply sources to mitigate risk, staff recommends continuing Bellevue’s practice of maintaining a minimum of 1-day of average water usage as standby storage for the Utility’s service area.

Next Steps

Staff will consider and incorporate your comments regarding draft policies discussed in April and May. The policies are being routed concurrently for comment by other city departments. Final policy recommendations will be included in the Draft Water System Plan presented for your review, as well as review by other stakeholders, later this year.