City of Washington Est. 1825

Memo

TO: Mayor Manier and City Council

FROM: Ed Andrews, PE - Public Works Director

DATE: June 7, 2019

SUBJECT: Water Tower #3 Design Discussion

At both the May Public Works Committee and the Committee of the Whole meetings the requirements for a third water were presented and discussed. This consideration is in follow up to a comprehensive evaluation of the City's water and sewer system in support of rate structure both as a sustainability of its existing system and its ability to support continued growth.

This item was requested by Council to come back before the Committee of the Whole Meeting, mainly addressing which have since arisen:

(Q) Do we expect to see water usage increase as a result of breakage from aging infrastructure?
(A) Unaccounted for water increases as pipe age and leaks develop. While meter replacement in 2016 helped address approximately 1/3 of unaccounted for water, aging infrastructure then becomes the lion's share of the remainder. Even showing a slight rebound from 20.4% unaccounted for in 2017 to 22.3% in 2018.

(Q) In the 2019/2020 budget that we received on 5-6-19, WT3 is budgeted on page 108. The engineering study ($125,000) was supposed to happen in FY 19/20 with the remainder of the construction ($2,525,000) to happen in FY 20/21. The grand total for the budgeted construction was ($2,650,000) for a difference of $150,000 from the initial assessment.
(A) It has been estimated that steel prices have increased on the order of 5%. Some forecasting of inflation should continue to budgeted with any project that is deferred or delayed. Operational costs of the water and sewer plant have increased an average of 4.2% annually.

(Q) What is the proposed method of payment for funding the tower construction?
(A)Loan financing.

(Q)The water tower cost was not included in the sewer rate study, so that means that to fund construction we would be adding an additional cost to city water users immediately after raising their water/sewer rates.
(A) No, WT#3 is already forecasted as a loan under our current 30-year operation projections. Given the life span of a tower (60 to 80 years), we'd be looking at an IEPA low interest loan over a 20-year period. At $2.5M and 3% interest, that would be $168k/yr. or $2.50 per account. We would not be building it immediately, but would ideally have engineering in-hand for possible Capital Bill Opportunities and to be able to be in the ready for Agency requirements.

(Q)What businesses are we expecting that would need this additional water capacity?
(A) Water capacity is a market tool in and of itself. Our ability to support development within 223 as well as the 160 acres of Freedom Parkway corridor would anticipate usages of 1,000gpd to 1,500gpd per acre. This would be approximately 0.4 to 0.575 MGD of demand for this area.

(Q) Will the winery have the capability to be asked to be hooked up to city water at a future date?
(A) The winery will be on well water and is allowed to be as such. There is no requirement or driver for them to be connected to City water or sewer and is not a driver in the WT#3 discussion.

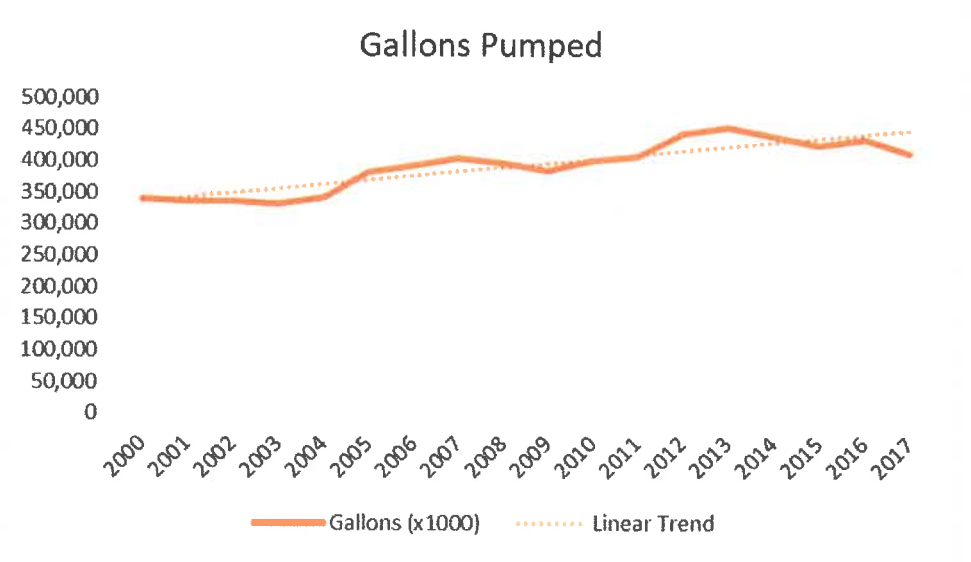
(Q) Do we expect the IEPA and/or 10 state rule will enforce these regulations within the next fiscal year?
(A) Yes, the adoption of the recommended 10 States Standard is before the IEPA to adopt as a formal ILCS. As a comparison the City undertook meter replacement in 2016 to help address unaccounted for water. In the Summer of 2018, the agency's letter of finding required us to reduce our previous 30+% unaccounted for down to the low 20's%. We had largely already met that requirement.

(Q) It was discussed that the potential location for the water tower be on the Northeast corner of the 223 property. Is this the final location, or can the water tower potentially be moved to another area depending on the value/attractiveness of the land for the 223 property?
Are there additional engineering/infrastructure costs associated with moving the tower to the narrow piece of land across 24?
(A) Possibly, the intent of the design is to refine the exact location so as to be able to fill the tower under operating system pressures rather than the expense of booster pump.

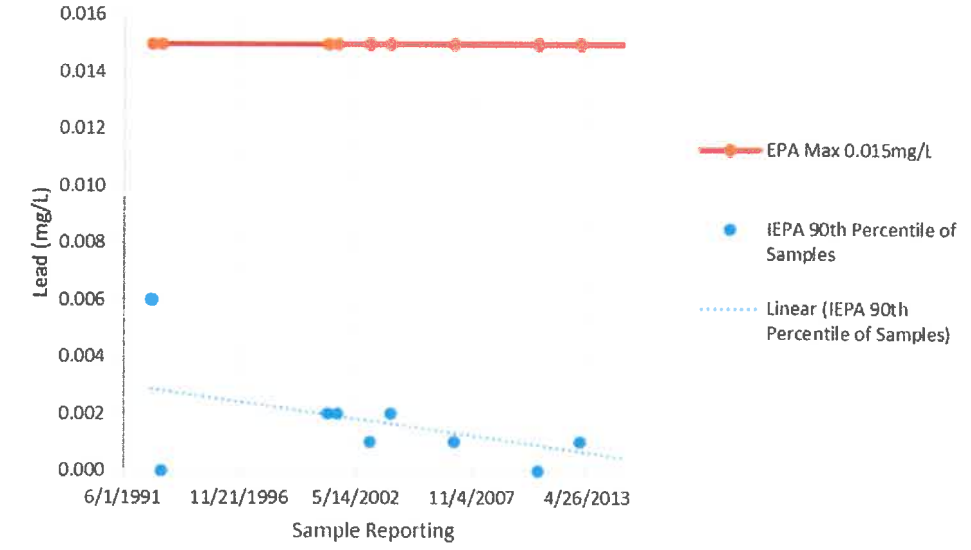
(Q) In the packet that we received the information was related to total above ground water storage over the course of the last 18 years (2000-2018). In this it appears that water consumption has started to level off and decline.
(A) While that may be the case for the last two years, gallons pumped to the system since 2000 show similar rise and falls (see 2000 to 2005). The effects of the meter upgrade program with increased accuracy have an effect of conservation in households that had slow read meters. In-

home smart meter leak detection has allowed the City to be more proactive, this is only for leaks behind the meter and doesn't help with aging infrastructure components.

Below is the Total Gallons Pumped from each WTP to System per Year, again an upward trend.

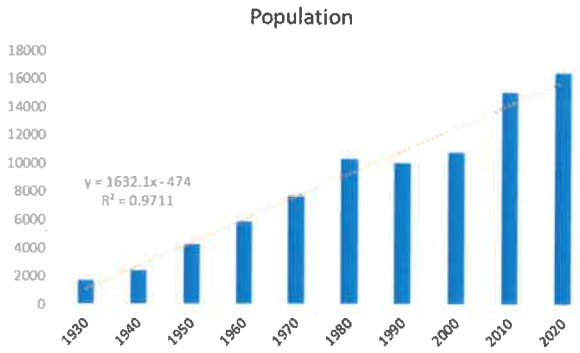


(Q) One of the concerns that was brought up by residents was regarding lead abatement. I had asked Ray if he knew the total percentage of lead piping currently in the city and if there was a plan to address those first as part of the water infrastructure plan.
(A) Lead is monitored under US EPA's Lead & Copper Rule. The City of Washington started adding phosphate after the initial sampling in 1992 showed the system at 40% of the allowable limit. Since undertaking that addition, the City has maintained these levels at less than 13% of the allowable limit. We would look to replace Cast Iron Pipes and water service lines under the planned reconstruction program.



Additionally, the original trend line data and discussion, previously presented follows:

Year	Population	% Incr
1930	1741	3%
1940	2456	41%
1950	4285	74%
1960	5919	38%
1970	7722	30%
1980	10364	34%
1990	10099	-3%
2000	10841	7%
2010	15100	39%
2020	16500 est	9%



The general trend has continued upward, with additional Special Census data shown below.

Census	1970	7722
Spl Cen	1973	9466
Spl Cen	1977	10045
Census	1980	10364
Census	1990	10099
Spl Cen	1993	10136
Spl Cen	1997	10505
Census	2000	10841
Census	2010	15100
Spl Cen	2018	16566

As previously mentioned, IEPA's past references to Ten States Standards as a guideline are being adopted as formal regulatory requirements under Title 35 that would have us make this consideration under:

Section 604.1300 General Storage Requirements

a) Storage facilities shall have sufficient capacity to meet domestic demands, and where fire protection is provided, fire flow demands.

Section 604.1340 Elevated Storage

a) The minimum storage capacity shall:
   1) be equal to the average daily usage or be based on an engineering study of the distribution system hydraulic conditions, anticipated domestic water demands of the system, and where fire protection is provided, fire flow demands; and
   2) be capable of maintaining adequate pressures as described in Section 604.1415(a);

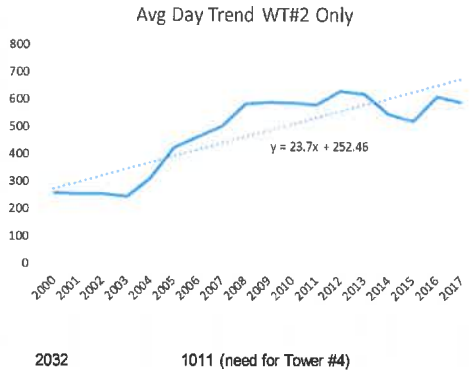
Since the City of Washington's water system operates as two largely separate (but interconnected zones) a review of average day from the combined system and water treatment plant, WTP#2 was conducted.

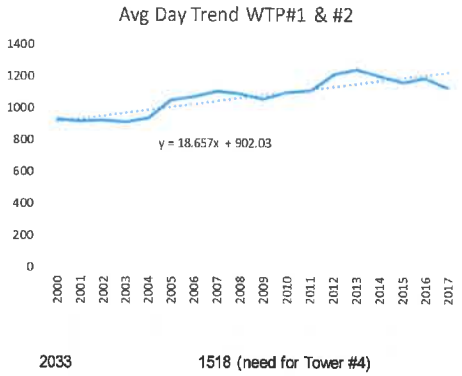
WTP#2 w/ WT#2 and future #3

Year	Avg Day WTP#2	Forecast Avg Day	Capc WT#2	Avg Day as % of WT#2	% Use of WT#3
2000	259	252	500	52%	
2001	255	276	500	51%	
2002	254	300	500	51%	
2003	246	324	500	49%	
2004	311	347	500	62%	
2005	424	371	500	85%	
2006	464	395	500	93%	
2007	504	418	500	101%	1%
2008	586	442	500	117%	17%
2009	593	466	500	119%	19%
2010	589	489	500	118%	18%
2011	581	513	500	116%	16%
2012	632	537	500	126%	26%
2013	621	561	500	124%	24%
2014	550	584	500	110%	10%
2015	523	608	500	105%	5%
2016	613	632	500	123%	23%
2017	592	655	500	118%	18%

WTP#1&#2 w/ WT#1&#2 and future #3

Year	Avg Day WTP#1 & WTP#2	Forecast Avg Day	Capc WT#1 & WT#2	Avg Day as % of WT#1 & #2	Capc WT#1, #2 & #3	Avg Day as % of all 3 WTwrs
2000	931	902	1000	93%	1,500	62%
2001	922	921	1000	92%	1,500	61%
2002	926	939	1000	93%	1,500	62%
2003	915	958	1000	92%	1,500	61%
2004	941	977	1000	94%	1,500	63%
2005	1051	995	1000	105%	1,500	70%
2006	1078	1014	1000	108%	1,500	72%
2007	1111	1033	1000	111%	1,500	74%
2008	1093	1051	1000	109%	1,500	73%
2009	1058	1070	1000	106%	1,500	71%
2010	1103	1089	1000	110%	1,500	74%
2011	1120	1107	1000	112%	1,500	75%
2012	1220	1126	1000	122%	1,500	81%
2013	1248	1145	1000	125%	1,500	83%
2014	1209	1163	1000	121%	1,500	81%
2015	1170	1182	1000	117%	1,500	78%
2016	1197	1201	1000	120%	1,500	80%
2017	1134	1219	1000	113%	1,500	76%





2032 1011 (need for Tower #4)

2033 1518 (need for Tower #4)

Average day exceeding elevated storage capacity first occurred between 2005 and 2007 and shows a forecasted need of fourth tower in 2033.

This matter has been placed on the Committee of the Whole meeting agenda of Monday, June 10th, 2019 for review and discussion.

cc: File