City of St. Petersburg

Committee of the Whole

Meeting of July 26, 2018 @ 2:30 p.m.

City Hall - Room 100

A. Call to Order – Council Chair Lisa Wheeler-Bowman

B. Discussion Item
   a. Presentation by Takamatu Student Ambassadors to St. Petersburg
   b. Reclaimed Water System (Montanari 1/18/18)
   c. Potable Water Audit (Montanari 11/2/17)

C. Next Meeting – September 6, 2018 @ 1:00 p.m
   Tropicana Field

D. Adjournment
TO: Members of City Council

DATE: January 5, 2018

COUNCIL DATE: January 18, 2018

RE: Referral to a Committee of the Whole
Reclaimed Water System Review

ACTION DESIRED:

Respectfully request City Council refer to the Committee of the Whole a review by Administration of our reclaimed water system to include the following:

- History
- Benefits
- Billing
- System expansion
- Financial considerations / grant opportunities

Ed Montanari, Council Member
District 3
TO: Members of City Council

DATE: October 27, 2017

COUNCIL DATE: November 2, 2017

RE: Referral to Committee of the Whole – Discussion of the October 2017 Potable Water Supply System Water Audit

ACTION DESIRED:

Respectfully requesting a referral to a Committee of the Whole for a discussion on the October 2017 Potable Water Supply System Water Audit prepared by Greeley and Hansen.

Ed Montanari, Council Member
District 3
Committee of the Whole

July 26, 2018

* Reclaimed Water System

* Potable Water Audit
Reclaimed Water Program

- History and Benefits
  - Billing
  - System expansion
  - Financial considerations / grant opportunities

1972
- The state legislature enacted the Wilson-Grizzle act, significantly restricting nutrient discharge into Tampa Bay.

1978
- 201 Facility Plan Includes Effluent Irrigation and Injection Well for Backup Disposal.

1981
- Major Reclaimed Transmission Loop Completed with EPA Grant Funding. First Reclaimed Water Master Plan Developed.

1983
- Construction Begins on Major Residential Irrigation Areas 1 through 4 with EPA Grant Funding between 75% and 85%. Council Resolutions 83-75 and 85-85.

1987
- Effluent discharge to Tampa Bay ceases, making St. Pete the first major U.S. City to achieve zero discharge.

1991
- Expansion and Reclaimed Water Transmission Mains in the Gateway Area Funded 50% by SWFWMD.
Reclaimed Water Program

- History and Benefits
- Billing
- System expansion
- Financial considerations / grant opportunities

1995
- Mayor and City Council adopts an aggressive program to further expand the Reclaimed Water System up to the maximum system capacity.

1999
- Reclaimed Water System Master Plan Update indicates the system is quickly approaching maximum capacity.

2001
- Demand outpaces supply and Mayor declares first reclaimed water emergency shortage.

2005
- SWFWMD provides cooperative funding to improve storage capacity at the Water Reclamation Facilities. Aquifer Storage and Recovery (ASR) used to manage shortages.

2007
- Reward well used to manage shortages.

Today
- St. Petersburg is the 3rd largest supplier of reclaimed water for residential irrigation and the 6th largest overall supplier in Florida. No petition for expansion has resulted in a greater than 50% commitment since late 1990's.
Reclaimed Water Program

- History and Benefits
- Billing
- System expansion
- Financial considerations / grant opportunities

Target areas for the installation of the reclaimed water system were closer to sea level with saltwater intrusion in the shallow wells/ aquifer systems.
Reclaimed Water Program

- Benefits include
  - reducing potable water use,
  - decreasing fertilizer application,
  - reducing discharge of nutrients into surface waters, and
  - ensuring a sustainable and cost-effective water supply.

- Initial Driver
  - Wilson Grizzle Act

- Innovation Spearhead
  - In 1977, the city of St. Petersburg built the first urban, reclaimed system in the United States.

- Expansion Outreach
  - The 1995 “Mayor’s Reclaimed Expansion Sale” extended the assessment period from 3 to 10 years and reduced the interest rate from 8% to 6%.
Reclaimed Water Program

Since 1994, avoided annual estimated costs between $14.7M and $34.6M
  ○ In current dollars, between $18.6M and $49.9M per year

✓ By not abandoning the injection well:
  • Avoided estimated total costs between $100 million and $400 million
    • In current dollars, between $156 million and $623 million
  • Avoided annual estimated debt service between $6.5 million and $26.0 million
    • In current dollars, between $10.1 million and $40.5 million per year

✓ By not expanding potable water expansion:
  • Avoided estimated total costs between $25 million and $30 million
    • In current dollars, between $29 million and $43 million
  • Avoided annual estimated debt service between $1.6 million and $2.0 million
    • In current dollars, between $1.9 million and $2.8 million per year

✓ By not purchasing water supply from TBW:
  • Avoided estimated costs of approximately $6.6 million per year
    • Based upon estimated reclaimed water sold by St. Pete using an average annual TBW rate of $2.61 per Tgal
    • Less estimated average annual reclaimed water allocated system costs
Reclaimed Water Program

- Even at full cost recovery, irrigating with reclaimed water is significantly less expensive than irrigating with potable water

<table>
<thead>
<tr>
<th>Reclaimed Water</th>
<th>Current</th>
<th>FY 2019</th>
<th>FY 2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmetered Rate</td>
<td>$26.72</td>
<td>$29.59</td>
<td>$49.31</td>
</tr>
<tr>
<td>Monthly Use (TGAL)</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Cost / TGAL</td>
<td>$1.34</td>
<td>$1.48</td>
<td>$2.47</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Potable Water</th>
<th>Current</th>
<th>FY 2019</th>
<th>FY 2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rates + TBW</td>
<td>$228.87</td>
<td>$237.46</td>
<td>$275.27</td>
</tr>
<tr>
<td>Usage (TGAL)*</td>
<td>20</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Cost / TGAL</td>
<td>$11.44</td>
<td>$11.87</td>
<td>$13.76</td>
</tr>
</tbody>
</table>

* Bill calculation assumes 4 TGAL of indoor usage, as well as 20 TGAL for outdoor irrigation
Reclaimed Water Program

Components of the Reclaimed Water Customer costs for connection.

- Assessment Fee – Property square footage times the assessment rate.
  - Includes simple interest during the assessment period for 3 years at 8%
- Connection Fee – The actual cost of the labor and connection appurtenances at the time of connection.
- Monthly Bill – Flat rate for residential, varies for commercial and multifamily.

- History and Benefits
- Billing
- System expansion
- Financial considerations / grant opportunities
## Reclaimed Water Program

### Example Areas 1986 - 1990

<table>
<thead>
<tr>
<th>Area</th>
<th>Average Assessment Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Critical Areas 1 thru 4</td>
<td>$275*</td>
</tr>
<tr>
<td>Placida Way</td>
<td>$445</td>
</tr>
<tr>
<td>Northeast Park Shores 1 &amp; 2</td>
<td>$500</td>
</tr>
<tr>
<td>30th Street North</td>
<td>$625</td>
</tr>
</tbody>
</table>

* Received 75% to 85% EPA Grant Funding

### Example Areas 1991 - 1994

<table>
<thead>
<tr>
<th>Area</th>
<th>Average Assessment Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holiday Park 1 &amp; 2</td>
<td>$1,215</td>
</tr>
<tr>
<td>Lakewood Estate Tract and Blocks</td>
<td>$1,365</td>
</tr>
<tr>
<td>Northshore Drive</td>
<td>$1,573</td>
</tr>
<tr>
<td>Meadowlawn 9th Addition</td>
<td>$1,912</td>
</tr>
<tr>
<td>Sunrise Drive S.</td>
<td>$2,441</td>
</tr>
<tr>
<td>Central Ave. - Pinellas Way</td>
<td>$3,362</td>
</tr>
</tbody>
</table>

### Distribution of Assessment Fees

- [Diagram showing distribution of assessment fees]

- History and Benefits
- Billing
- System expansion
- Financial considerations / grant opportunities
Reclaimed Water Program

- History and Benefits
- Billing
- System expansion
- Financial considerations / grant opportunities

Potential Reclaimed Supply Vs. Demand

The maximum carrying capacity of the system has been estimated between 15,000 and 17,000 accounts depending on conservation and storage capacity.
Reclaimed Water Program

- On the most recent reports to DEP and SWFWMD, the typical residential reclaimed customer accounted for 45% of the reclaimed flow and used 825 gallons per day on average.

- If all available connections were active, approximately 3 MGD of additional reclaimed water could be utilized on an average day.
Reclaimed Water Program

Tools used to Manage Seasonal Demand

- 43 MG of Ground Storage
  - Northeast WRF – 18 MG
  - Northwest WRF – 10 MG
  - Southwest WRF – 15 MG

- Recovery & Reward Wells
  - Recovery well – 1.5 MGD
  - Reward Well – 1.1 MGD

- Pressure Reduction
  - Reducing pressure on the reclaimed distribution system can manage demand but can result in poor coverage.

WATERING RESTRICTIONS

- §27-170(b) Restrictions On Time And Application Rate
- §27-170(C) Restrictions On Times & Days Per Week
Reclaimed Water Program

Current Expansion Policy and Procedure

- Residents Petition for Extension (needs at least 51% of property owners)
- WRD Prepares a Preliminary Cost Estimate
- A Cost Packet is Provided to the Property Owners
- Property Owners Agree to the Cost and Legal Requirements
- Council is Asked to Approve the Bid and Authorize the Project
- If Bid Exceeds 10% of Cost Estimate the Property Owners May Re-negotiate
- The System Extension is Designed and Bid
- Legal Prepares Resolution for Action by City Council

After Construction Individual Bills are Sent to the Property Owners.
Reclaimed Water Program

Possible considerations in order to significantly expand the system:

- Increase storage capacity through ASR or surface storage.
- Develop an alternative source of irrigation water, such as stormwater ponds, to mitigate dry weather shortages.
- Further promote conservation through mandatory seasonal watering restrictions and enforcement.
- Promote conservation through volumetric tiered billing.
  - Proposed in the FY 2019 budget is $50,000 to evaluate the benefits and challenges of metering St. Petersburg's reclaimed water.
Reclaimed Water Program

- The majority of the City’s $160+ million dollar reuse system was co-funded through City and EPA grants (75% – 85%) until the early 1980’s.


- Since FY1991 SWFWMD has provided St. Petersburg with more than $9 million in District funds for 10 reclaimed water projects. However, only two projects ($0.325 million) provided a main extension.

- The District has an ongoing annual Cooperative Funding Initiative program to provide financial incentives (typically 50%) for projects such as reclaimed water expansions which result in potable water offsets.

https://www.swfwmd.state.fl.us/business/finance/cooperative-funding-initiative

- SWFWMD has expressed interest in a project the City applied for in 2010 to provide reclaimed water to the Duke (formerly Progress Energy) Weedon Island Power Facility.

- Application was withdrawn by the City because Duke did not believe the project was cost effective at the time, due to extensive treatment needed to use the water.
Committee of the Whole
July 26, 2018

- Reclaimed Water System
- Potable Water Audit
Potable Water Audit

- The City of St. Petersburg annually submits a Public Supply Annual Report (PSAR) to the Southwest Florida Water Management District.
- The PSAR for 2015 and 2016 showed that each year’s water loss exceeded the allowable limit of 10%, requiring a water audit.
- In 2016 new management in the Water Resources Department identified a reporting error and recalculated the PSAR Water Loss resulting in exceeding the 10% threshold on the 2015 PSAR.
Potable Water Audit

WATER AUDIT STANDARD FORMAT

Source: American Water Works Association (AWWA) M36 Manual
Potable Water Audit

AWWA Water Audit Benchmark Comparison

<table>
<thead>
<tr>
<th>Benchmark</th>
<th>St. Petersburg Audit Results</th>
<th>2017 AWWA National Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apparent Losses</td>
<td>14.4 gal./connection/day</td>
<td>7.57 gal./connection/day</td>
</tr>
<tr>
<td>Real Losses</td>
<td>15.5 gal./connection/day</td>
<td>35.94 gal./connection/day</td>
</tr>
</tbody>
</table>

Source: AWWA Water Audit Benchmark Data.
Potable Water Audit

- Small meter underreporting and flushing volume were the majority of the real and apparent losses in the distribution system.
- They accounted for 63% of the losses in 2015 and 79% in 2016.
- Improvements in these areas would have the largest impact on system losses.

UNI-DIRECTIONAL FLUSHING IN ST. PETERSBURG

Uni-Directional Flushing (UDF) cleans the water mains by flushing sequences of water from one fire hydrant to another.

High velocities of water will scour the water mains and remove mineral deposits, biofilm and sediment that accumulate in the water mains.

In most cases, residents will not notice any changes to their water delivery during the UDF process, though you may notice a slight discoloration. You can run your faucets for a short time after the flushing program has been completed until water is clear. Micronized water does not pose any health hazards.

If your water does not clear up after 5 to 10 minutes, please contact St. Petersburg Water Resources at 727-893-7261.
Potable Water Audit

Operational Constraints

- The 12 month running average chloramine residual for approximately 180 sample sites in the distribution system cannot exceed 4.0 mg/L
- The minimum chloramine residual prior to distribution must be 4.5 mg/L
- The single site minimum chloramine residual of any of the 180 sample sites is 0.6 mg/L

Distribution System Chloramine Residual Operating Range

- Running Annual Average
- Running Average Limit
- Single Site Minimum
- Single Site Minimum Limit

Chloramine Residual (mg/L)

January 2017  April 2017  July 2017  October 2017  January 2018  April 2018

Immediate Line Flushing and resample
Potable Water Audit

System Improvements

- Replace underreporting small meters

- Flush more effectively by utilizing a unidirectional flushing program.

- Decrease water age by reducing redundant piping

- Increase chloramine residuals for the months of June through September

- Perform an evaluation study and develop strategies other than flushing to improve water quality
Process Improvements

- Formalize quarterly meetings between Water Resources and Billing and Collections with the goal of identifying queries on the customer accounts that reveal potential unaccounted water in the distribution system.

- Interface the utility accounting software to a system with accounts linked to GIS.
System Improvement Projects

- The Water Resources Department has tested and replaced over 21,000 underreporting meters since May of 2015. The FY 2019 proposed budget includes $1.37 M for 10,000 - 2" and smaller meters and 12 - 3" and larger meters and backflow devices.

- Water Quality Evaluation (Consultant selected and will be coming to Council for approval in September)
Potable Water Audit

System Improvement Projects

Oberly Chloramine Booster
• Designed and currently with Procurement for bid

Satellite Leak Detection (SWFWMD Project #N961)
• 1,600 miles of transmission and distribution piping
• FY 2019 Proposed Cost = $120,000
• Proposed SWFWMD Funding = $60,000
• SWFWMD Ranking 2018 = High
• SWFWMD Cost Effectiveness Calculation = less than $3.00/kGal
• Estimated Potable Water Conservation Benefit = 110,000 gpd
Potable Water Audit

Flushing Reduction Projects.

<table>
<thead>
<tr>
<th>No.</th>
<th>Description/ Location</th>
<th>Size (inches)</th>
<th>Length (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Eliminate 16-inch water main which begins at 1-275 and 54th Ave. S. and continues west to Pinellas Bayway / Isla Del Sol</td>
<td>16</td>
<td>3,300</td>
</tr>
<tr>
<td>2</td>
<td>Eliminate 20-inch water main from 31st St. S. and 54th Ave. S. south to Pinellas Point Dr. S. / Roy Hanna Dr. S. 62nd Ave. S. and continuing along until 12th St. S. where it turns north to 50th Ave. S. then south along Martin Luther King Jr. St. S. back to Pinellas Point Dr. S.</td>
<td>20</td>
<td>20,000</td>
</tr>
<tr>
<td>3</td>
<td>Reduce 6-inch water main from 32nd Way S. and Pinellas Point Dr. S. headed west towards 1-275 and continuing south along Sunshine Skyway Ln. S. to a 12-inch water main</td>
<td>16</td>
<td>1,500</td>
</tr>
<tr>
<td>4</td>
<td>Eliminate 12-inch parallel water main along 1-275 and Sunshine Skyway Ln. S. south of the existing 16-inch water main and parallel to an 8-inch water main</td>
<td>12</td>
<td>2,500</td>
</tr>
<tr>
<td>5</td>
<td>Reduce 8-inch water mains running south from Pinellas Point Dr. S. along 21st St. S., Bethel Way S., and 14th St. S. to 2-inch water mains</td>
<td>8</td>
<td>3,280</td>
</tr>
<tr>
<td>6</td>
<td>Reduce 8-inch water main where 70th Ave. S. turns into Pinellas Point Dr. S. and continues east becoming 4th St. S. which turns north to 54th Ave. S. to a 6-inch water main</td>
<td>8</td>
<td>14,600</td>
</tr>
<tr>
<td>7</td>
<td>Reduce 2-inch water main along 65th Ave. S. between Martin Luther King Jr. St. S. and 4th St. S. to an 8-inch water main</td>
<td>12</td>
<td>2,700</td>
</tr>
<tr>
<td>8</td>
<td>Reduce 8-inch water main along 68th Ave. S. between Dr. M.J.K Jr. St. S. and 4th St. S. to a 6-inch water main</td>
<td>8</td>
<td>2,800</td>
</tr>
<tr>
<td>9</td>
<td>Upsize 8-inch water main along 31st St. S. from 54th Ave. S. to Pinellas Point Dr. S. to a 12-inch water main</td>
<td>8</td>
<td>3,600</td>
</tr>
</tbody>
</table>