

Flow and Loadings Projections

Issue:

The District is seeing year over year growth in loadings to the treatment facility for some parameters (primarily flow, BOD, and ammonia) that is out pacing the traditional methodology of using the 3-year rolling average of the three most recent completed years data to predict flow and loadings for the current budget year. The methodology in use has served the District well in the past however, in the current growth phase the actual loadings are consistently higher than the annual projections resulting in excess year end revenue in District Unrestricted account. The District desires to collect enough sewage revenue to safely cover its debt service and budgeted expenditures while avoiding to the extent practical any excess charges to its member communities that are over and above its budgeted needs. This effort is an attempt to identify competing methodologies that may prove more accurate for use in future budgets.

Currently in use:

3 Year Rolling average (uses the 3 most recent completed years data)

- Method uses actual loadings from the 3 completed and most recent years.
Ex/ For 2020 rates the years used are 2018,2017,2016

Pros:

- A rolling average soothes out loadings projections and provides a buffer from major rate sewer rate swings. Slow and steady increases/decreases in sewer billings for the District and member communities.
- Methodology is common throughout Utilities and works well in a stable, slow growth situation. This method has been in long term use by the District.

Cons:

- Does not use the most representative data of the current year. Flow and loadings data is up to 4 years old.
- Rates don't keep pace with loadings creating surpluses in times of growth and deficits in times of contraction.

Options considered:

3 year rolling average - Weighted average

- Similar to current method with emphasis placed on more recent data. This would be an improvement over the current method but uses loading data that is outdated.

Ex/ 2020 rates would use 2018 – 50%, 2017 – 35%, 2016-15%

4 year rolling average - Weighted average

Ex/ 2020 rates would use 2018 – 40%, 2017 –30%, 2016-20%, 2015 – 10%

Ran this on historical ammonia and BOD and the results were further off than the existing method – data is too old!

3 Year Rolling Average + a growth factor

- Method would be the same as currently in use plus an additional step. The projection would be subject to a multiplier (growth factor) equivalent to the observed loadings growth. This would be an improvement on the current method with the growth factor necessary to compensate for using old data. Ex/ For 2020 rates the years used are 2018,2017,2016

Ex/ A rate parameter loading is increasing at 5% per year. The final projection would be multiplied by 1.05 in order to account for expected annual growth for the budget year.

After running the above options, it became clear that in each method the challenge was the use of old data and it being applied to the current loadings' projections. We then determined that simply applying a projection for the current year and dropping the oldest data year would achieve closer projections while preserving the pros of using the 3-year averaging method.

Rate adjustment for July-December 2020 - Recommended method for projections

- Maintain the 3-year rolling average but include a projection of the current year in place of the oldest years data. The 20/19-year projection would include the first 5 months (June not yet completed) of actual data from 2020 along with the last 7 months actual data from 2019 the previous year added to it.
- Method removes the low bias from using old data and also avoids the assumption of loadings growth by not requiring a growth factor to be added to projections.

Ex/ 2020 rates – 2020 projected, 2019 actual, 2018 actual

Data from 2017 would drop off and be replaced by 2020 projected. The loadings from the second half of 2019 are used twice – once for the 2019 actual projection and again in projecting the second half of 2020.

If a consensus is reached this item will be brought back for the next Commission meeting along with the corresponding sewage rates for use in billing for second half of 2020.