

# MADISON METROPOLITAN SEWERAGE DISTRICT FOAM STUDIES UPDATE

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# CURRENT STUDIES

- ◉ MMSD sponsoring joint research effort by Dr. Noguera and Dr. Long (both of UW-Madison)
- ◉ Primarily evaluating impact of PAX-14 added to aeration basins on digester foaming, digester microbiological classification, and biological phosphorus removal efficiency
- ◉ Concurrent with this study we are evaluating digester loading impact on foaming potential

# PAX-14 TRIAL (1/4 SCALE)

- PAX-14 is poly-aluminum chloride
- Known to alleviate aeration tank foaming
- Impact on anaerobic digesters uncertain
- Study plan will feed bench digesters
  1. WAS and primary sludge similar to the rest of Nine Springs WWTF to one bench digester;
  2. PAX-14 dosed WAS and primary sludge will be fed to the other bench digester.
- 15 day SRT on both bench digesters
- Foaming observations and measurements plus DNA observations will be recorded

# DIGESTER LOADING TRIAL

- ◎ Concurrent with PAX-14 trial, using 2 more bench-scale reactors
- ◎ 3<sup>rd</sup> reactor is “high loading” at 10 day SRT
- ◎ 4<sup>th</sup> reactor is “low loading” at 25 day SRT
- ◎ The “non-PAX” reactor is also the 15 day SRT reactor for this study
- ◎ Hoping to obtain a “rough cut” on relative impact of loading rate to see if worthy of further study

# DNA ANALYSIS OF FOAM

- Looking at the genetic cross-section of foam to determine what micro-organisms are present and to what extent PAX-14 impacts (if at all)
- Testing foam from bench scale digesters as well as full-scale digesters and the secondary treatment process
- Seeking to confirm if *Microthrix* is indeed the primary organism of concern

# RESULTS SO FAR:

- ⦿ Early indications seem to confirm that higher loading increases foaming potential, but maybe not to degree expected
- ⦿ Some early hints that *Microthrix* may correlate to foaming but may not necessarily be causative...
- ⦿ PAX-14 trial start has been delayed primarily due to delay in start of our normal winter foam, plan to kick off approximately Feb 20

# NINE SPRINGS UPDATE

- Digester foaming did not cease completely this past summer, unlike previous years
- Starting late summer we have been more “aggressive” in digester operation
  - Maximized liquid levels late summer, have held as high as we can
  - Maximized mixing to extent possible
- Onset of “seasonal foam” has also been delayed, unsure why
- Basically, has been atypical behavior since last CSWEA Foaming Workshop...

# QUESTIONS?

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