

ODOR ELIMINATION PROGRAM AT OWASA'S MASON FARM WASTEWATER TREATMENT PLANT

2008 ANNUAL REPORT TO THE TOWN OF CHAPEL HILL

January 20, 2009



The Mason Farm Wastewater Treatment Plant (WWTP)



The yellow arrow above indicates a carbon filter installed in 2007 to remove odor from the tanks at a pump station and some other areas inside the WWTP.

HIGHLIGHTS

- ✓ Based on our consultants' recommendations, the next steps planned in the odor elimination program will be covering our three primary settling tanks and eight biological treatment tanks ("aeration basins").
- ✓ On June 26, 2008, the OWASA Board adopted a 15-year Capital Improvement Program including \$4.2 million for fiscal years 2009 through 2011 to cover the primary settling tanks and eight aeration basins.
- ✓ Following a review of OWASA's financial picture in October, the OWASA Board awarded a contract on December 11, 2008 for covering the primary settling tanks. The work is about to begin and completion is expected in September, 2009.
- ✓ Design work for covering the aeration basins is nearly complete. Due to the significant reductions in water demand during and since the drought of 2007-08 and their effect on our budget, we anticipate the OWASA Board will again review our financial data and projections before making future decisions on seeking bids and awarding a contract. The project to cover the aeration basins is listed in our capital program for completion in Fiscal Year 2010-11.
- ✓ We are continuing to keep the WWTP neighbors and the Town informed about our odor elimination program including key actions, the status of capital projects and our quarterly and annual reports to the Town about the odor monitoring program, etc.

BACKGROUND

Odor studies

- ✓ In 2004, the consulting firm of Hazen and Sawyer analyzed odor sources and recommended odor elimination improvements at the Mason Farm WWTP.
- ✓ In May, 2007, the consulting firm of Black & Veatch completed a second odor study at the WWTP. The study included an assessment of odor sources based on improvements then in place, evaluation of options, estimated costs of corrective actions and industry practices and standards for odor elimination.

Definition of odor elimination

Following a public forum in November, 2006, the Town Council directed OWASA to develop a definition of odor elimination in consultation with WWTP neighbors and to develop a plan and timetable for odor elimination. In June, 2007, we completed our Draft Definition of Odor Elimination (Attachment 1) in consultation with representatives of the Highland Woods neighborhood and the North Carolina Botanical Garden. The definition is marked as a draft because we believe it should be reviewed and improved in the future based on experience and future odor elimination technology.

Improvements for odor elimination, 2002-2008

Our investments in odor elimination through 2008 included:

1. Covering the tanks that hold treated wastewater solids (biosolids) before they are recycled; and installing an odor scrubber, which treats odor from the biosolids tanks. (2004; \$666,000)
2. Installing fixed covers on our four wastewater solids treatment tanks (“digesters”). (2005; \$1.6 million)
3. Improvements in solids treatment operations to reduce the amount of odorous solids returned to the biological treatment tanks (“aeration basins”). (2005; \$500,000)
4. Installing new aboveground pipes to carry foul air away from the digesters. The previously used underground pipes were an odor source. (2006; \$214,000)
5. Installing equipment to remove foam from the surface of our aeration basins. (2007; \$196,000)
6. Building a new facility to receive septage (solids removed from septic tanks by private contractors). Odor from the new septage structure is captured and treated. (2007; \$47,000)
7. Building a new, enclosed “headworks” structure. The headworks is the area where wastewater enters the plant. Foul air from the headworks is treated in the odor scrubber. (2007; \$2.2 million)
8. Enclosing three facilities:
 - “Splitter boxes” which are involved in carrying wastewater to and from the primary settling tanks,
 - the tanks at a pump station inside the WWTP site and
 - the channel that carries wastewater to the biological treatment basins; with foul air treatment (2007; \$477,000)

9. Connecting the exhaust air pipe from a new pump station at the WWTP to the odor scrubber (2007; \$50,000)
10. Connecting the exhaust air pipe from the solids dewatering building to the odor scrubber (2007; \$127,000)

The operating and maintenance costs for odor elimination totaled \$140,000 for the 2008 calendar year, including \$47,000 for personnel time, \$53,000 for treatment chemicals and \$40,000 for replacing the filter material (wood chips) in an odor removal facility called the biofilter.

DISCUSSION

Additional improvements for odor elimination

The highest priorities in our odor elimination program are the capital improvements discussed below.

Based on recent recommendations from Black & Veatch; a review by Bowker and Associates, one of the top odor consultants in the nation; and testing for hydrogen sulfide levels, we are proceeding with covering the primary settling tanks to address what we now know is the highest priority odor source at the WWTP.

The OWASA Board awarded a \$1.0 million construction contract on December 11, 2008 for covering the primary settling tanks. Work will begin early in 2009 and completion is expected in September, 2009.

Design work for covering the aeration basins is almost complete.

Odor monitoring program at the WWTP

The June, 2007, Definition of Odor Elimination includes the following commitments by OWASA:

- Continuous monitoring of hydrogen sulfide levels with at least four devices in addition to checking every 8 hours for odor at the boundary of the WWTP site.
- Evaluation of portable odor testing equipment. (As previously reported, we have concluded that the “nasal ranger” device is not useful because it requires subjective judgments by the person using the device.)
- Performance requirements
 1. Hydrogen sulfide limit: 0.0
 2. Number of verified off-site odor events per year: three
 3. For other odors, a criterion called the “dilution to threshold” ratio shall be 5 or less (as further discussed in Attachment 1).

Attachments 2 through 4 provide information on the number of odor reports since January, 2002; odor events since January, 2007; and the results of our monitoring program.

Public communications

As requested in a neighborhood meeting in 2004, we communicate primarily by e-mail to WWTP neighbors. We invited neighbors to meetings of the OWASA Board to discuss odor elimination items on June 12, October 23, and December 11, 2008; gave notices of the expected odor events due to maintenance and construction; gave WWTP neighbors our quarterly and annual reports to the Town; provided periodic updates on the status of capital improvements; and reported on project milestones.

CONCLUSION

We look forward to the completion of the additional capital improvements at the Mason Farm WWTP as our highest priority in our odor elimination program.

We welcome any questions or comments you may have.

Attachments:

1. Draft definition of odor elimination
2. Monthly summary of calls and e-mails to OWASA from neighbors reporting odor in the WWTP area; and odor events in 2007 and 2008 as defined in the draft definition of odor elimination
3. Summary of on-site and off-site odor inspections and number of times odor was detected at the various monitoring sites
4. Summary of on-site hydrogen sulfide (H₂S) odor monitoring