



Maine Department of Environmental Protection
Bureau of Land & Water Quality
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A monthly newsletter for wastewater discharge licensees, treatment facility operators, and associated persons

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Shellfish Restoration

The September 2006 issue of O&M News included an article by John Glowa on sanitary surveys by DEP. That article mentioned two major reasons for conducting sanitary surveys: re-opening shellfish harvesting areas and cleaning up swimming beaches. This article will focus on re-opening shellfish harvesting areas, including the sanitation framework and what it takes to successfully re-open areas. Our shellfish restoration efforts are aimed almost entirely at areas where harvestable populations of filter-feeding mollusks like several species of clams, and mussels, are found. Sanitation efforts focus on clams and mussels because they concentrate microorganisms from the water, and people generally eat the entire clam or mussel.

The background for this effort is set by the National Shellfish Sanitation Program (“NSSP”). Throughout history, there have been a number of disease outbreaks such as cholera, typhoid fever and enteric fever that were probably caused by widespread contamination of shellfish by human sewage. There was a severe outbreak of typhoid on the east coast of North America in 1924 that was clearly linked to shellfish. This led to the creation of the NSSP in 1937, and its evolution into an international organization dedicated to the production of and commerce in clean shellfish.

The standards for harvesting of shellfish are set by the NSSP, and administered in Maine by the Department of Marine Resources. All areas open to the harvest of clams and mussels must meet both program and water quality standards. For an area to be open, it must have a current DMR “sanitary survey”, and must meet minimum bacteria standards. The NSSP sanitary survey must be repeated every 12 years and updated every three years. It includes a house-to-house survey along the shore (limited to 500 feet from shore), evaluates the hydrography of the area, and describes non-point source areas of concern like farms, streams, marinas, etc. The water quality standards are set primarily by fecal coli form bacteria scores, although other pollutants like heavy metals or dioxins can cause closures.

Bacteria sampling under the NSSP has traditionally been done with the multiple tube fermentation test, although the DMR has just changed to the use of a membrane filter method. Statistical analysis of the data requires 30 independent samples over a 5-year period. For an area to be classified as Open, the geometric mean, or most probable number (“MPN”), must not be above 14 colony-forming-units per 100mL. Also, the 90th percentile (“P90”) value has to be below 49 cfu/100mL for the multiple tube test, and will have to be below 31 cfu/100mL for the membrane filtration method. The potential causes of bacterial contamination are varied, including malfunctioning sewage treatment systems, domestic animals, pets, wildlife concentrations, non-point runoff, boat discharges, etc. When statistical analyses of bacteria data show that a harvesting area does not meet open criteria, the area is closed or restricted, either full-time or conditionally. The full list of shellfish area classifications is: Open, Conditionally Open (usually the condition involves rainfall above a certain intensity, or malfunction of a wastewater treatment plant), Restricted, Conditionally Restricted, and Prohibited. These classification categories are dependent on how high the MPN scores or P90 scores are.

Sanitary survey processes were described in the earlier article, so I will not repeat that story here. Once the threats to water quality are identified, DEP staff will work with local officials to get the malfunctioning systems corrected or replaced, with Agriculture Department officials to control manure runoff problems, and other agencies to address other sources. The DEP also has a grant program, the Small Community Grants Program that has helped many property owners of limited means correct their malfunctioning systems. To receive assistance under this program, the town

must submit the application and handle the paperwork and money for the property owner.

After the malfunctioning systems and other sources of bacteria have been cleaned up, DMR sampling will gradually show improvement in the statistical scores as clean samples replace the dirty samples in the 30-sample data set. When the MPN and the P90 scores drop below open area thresholds, the growing area can be opened to either conditional or fully open status. The process from closure of the harvesting area, through survey and cleanup to re-opening can take a long time – as much as 5 to 7 years.

An example of a project that demonstrates many of the facets of shellfish restoration is the work done at the end of the 1990s in Cushing, Maine which borders the Saint George River Estuary. The Saint George is a highly valuable shell fishing area, with extensive mudflats along the main channel, as well as a number of highly productive coves in Cushing and St George. The DEP, DMR and the Town of Thomaston had put significant efforts and financial resources into reducing sewage impacts from the Town of Thomaston sewer system and treatment plant to the upper Saint George River estuary, culminating with rebuilding much of the town sewer system and construction of a new treatment system that disposes of the treated sewage on land most of the year.

Within the Town of Cushing, DMR staff had been dissatisfied with progress identifying and eliminating sources of bacterial contamination, so they requested assistance from the DEP. DEP staff spent a number of survey days during 1998, 1999 and into 2000 conducting an intensive survey of the shoreline as well as significant streams

feeding the shoreline. We surveyed 387 properties, finding 40 illegal discharges. Of the illegal discharges, 29 were corrected by the property owners without any external assistance, and the Small Community Grant Program helped fund replacement systems for 11 properties. The total cost of the eleven systems using state assistance was \$77,000, with \$58,000 of that cost covered by the grant program. There was also one licensed overboard discharge that was eliminated with a 50% grant from a different DEP grant program, the OBD Removal Program, which helps eliminate licensed discharges only.

When DEP staff began the sanitary survey effort in 1998, 728 acres of shellfish growing area were closed to harvest or restricted to depuration harvesting. By 2005, the DMR had been able to open 502 acres due to improved bacterial scores, leaving only 226 acres closed or restricted. Additional acreage may open in the next year or two due to continuing improvement in bacteria scores. Restoration of these 500 acres to open harvesting is helping to provide a solid economic boost to the region based on the additional opportunities afforded to local clam harvesters.

Phil Garwood

Approved Training

November 7, 2006 in Saco, ME - QA/QC of Laboratory Instruments – Sponsored by JETCC – (207)-253-8020 – Approved for 3 hours

November 7, 2006 in Saco, ME - Working with Your Contract Lab & Data Evaluation – Sponsored by JETCC – (207)-253-8020 – Approved for 3 hours

November 7, 2006 in Augusta, Dyer Brook, Gorham & Orono, ME – Chemical Feed Pumps 101 – Sponsored by MRWA – (207) 729-6569 - Approved for 4.0 hours

November 8, 2006 in Waterville, ME - Applying Process Control Techniques to WWTF Operations – Sponsored by JETCC – (207)-253-8020 – Approved for 6 hours



November 14, 2006 in Hallowell, ME - Asset Management & Budgeting – Sponsored by JETCC – (207)-253-8020 – Approved for 6 hours

November 16, 2006 in Brewer, ME - Pump Station Basics, Retrofits & Troubleshooting – Sponsored by JETCC – (207)-253-8020 – Approved for 6 hours

November 28-30, 2006 in Westbrook, ME - O & M of Wastewater Collection Systems With voluntary *NEWEA Exam* – Sponsored by JETCC – (207)-253-8020 – Approved for 15 hours

December 5, 2006 in Winthrop, ME - Filtration Technologies for Effluent Enhancement – Sponsored by JETCC – (207)-253-8020 – Approved for 6 hours

December 7, 2006 in Augusta, ME - Hands-On GIS 101 for Infrastructure Management – Sponsored by JETCC – (207)-253-8020 – Approved for 6 hours

December 14, 2006 in Augusta, ME -
Advanced Microsoft Excel – Sponsored by
JETCC – (207)-253-8020 – Approved for 6
hours

Note: JETCC stands for Joint
Environmental Training Coordinating
Committee

MRWA stands for Maine Rural Water
Association

MWWCA stands for Maine Wastewater
Control Association

NEIWPC stands for New England
Interstate Water Pollution Control
Commission

WPETC stands for Wright Pierce
Environmental Training Center.

For Practice

1. What is the best long-term fix for high F/M sludge bulking?
 - a. Add chlorine to the RAS.
 - b. Decrease sludge wasting.
 - c. Increase sludge wasting.
 - d. Reduce sludge age.
2. How would you reduce the growth of bacteria in a filter bed?
 - a. Adjust the pH
 - b. Backwash more frequently
 - c. Pre-chlorinate
 - d. Slow the rate of filtration
3. If the feed time for sludge centrifuge operated in a batch mode is less than the optimum time,
 - a. a better centrate will result
 - b. a better effluent quality will result
 - c. a dryer discharge solid will result
 - d. a wetter discharge solid will result
4. Determine the solids loading on a floatation unit if the flow is 1.6 MGD and the influent suspended solids are 1,350 mg/l
 - a. 14,000 lb/day
 - b. 12,600 lb/day
 - c. 18,015 lb/day
 - d. 1,700 lb/day

10th Biannual North Country Convention a huge success

The 2006 two-day training conference for operators in Northern Maine was held this year on November 1st and 2nd in Presque Isle. Over 140 operators, vendors and trainers participated. Senator John Martin was the featured luncheon speaker on Wednesday and Andy Rudzinski, President of the Maine Wastewater Control Association addressed the attendees on Thursday. The 2006 North Country Convention was a record-breaking event and plans are already underway for the 2008 NCC!

Fall 2006 Exam

The fall 2006 Wastewater Operator Certification Exam was given on Wednesday -- November 15, 2006. The results should be available by Christmas. If you took the test this month, please be patient! We will get the results out as soon as we have them but correcting the exams is done out of State and we have no control over that process.

If you missed the deadline for the fall exam, you can sign up to take the test in the spring. The spring exam will be given in the usual locations on Wednesday, May 16, 2007.



Answers to *For Practice*:

1. b A high F:M ratio means that there are more bugs than necessary to “eat” the organic waste in the influent. Wasting reduces the number of bugs in the system and lowers the F:M ratio
2. c Disinfection is the best way to reduce bacterial growth on a filter bed.
3. d Optimizing the feed rate to a centrifuge will help insure that the sludge coming off the filter is as dry as possible
4. c Solids Loading = flow \times concentration \times 8.34
Solids Loading = $1.6 \times 1350 \times 8.34$
Solids Loading = 18,015 lb/day

Correction from Last Month

Last month we ran an article entitled “Effluent Exceedences and Coming Back into Compliance”. Unfortunately, I overlooked some language errors in the article during my review. I have included a corrected copy of the article below.

Sorry for any inconvenience.

Sterling Pierce
Compliance & Technical Assistance Unit
Supervisor

Just a Reminder! *Effluent Exceedences and Coming Back into Compliance*

Recently two facilities reported exceedences of their daily maximum bacteria limits and because they had performed the normal number of tests for that week (as required by their permits); they were under the assumption that they did not have to perform any further testing for that week. If you have an exceedence of any of your licensed parameters, you should continue testing until you can show that that parameter is back into compliance. It is certainly to a facility's benefit to demonstrate the nature of the problem, the actions taken, and the resulting improved effluent quality. Increased testing is one good way to do this. Bear in mind that multiple grab samples taken during a day (e.g. total residual chlorine or settleable solids) can be averaged to report a single daily value.

And lastly, don't forget that you must also report any exceedence(s) to the Department through a phone call/voicemail within 24 hours of the occurrence and that within five days of the occurrence you'll need to provide the Department with a report that includes the following information:

1. A description of the discharge and cause of non-compliance; and
2. The period on noncompliance, including exact dates and times; or, if not corrected, the anticipated time the noncompliance is expected to continue and steps taken to

reduce, eliminate and prevent recurrence of the non-complying discharge.

You may also use the attached Non-Compliance/Discharge Incident Report form. Thanks for your cooperation with this issue!