UMass & MassDEP
Drinking Water Assistance Center
(DW-ASSIST)
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Water Treatment Testing Services for EC-SDC

Introduction

The Massachusetts Department of Environmental Protection (MassDEP) Drinking Water Program (DWP) Emerging Contaminants in Small or Disadvantaged Communities Grant Program (EC-SDC) provides grants to eligible public water systems to address emerging contaminant issues in their drinking water. MassDEP DWP has partnered with the University of Massachusetts Amherst (UMass) Drinking Water Assistance Center (DW-ASSIST) to provide pilot and/or bench scale testing of treatment to public water systems in support of their potential EC-SDC projects. Testing services are available on-site via use of UMass' Mobile Water Innovation Laboratory, or on campus at UMass laboratories. This document outlines some of the testing services UMass is able to provide to eligible PWS, however note that services will be available on a case-by-case basis, as determined by MassDEP and UMass.

Jar Testing

Jar testing is a laboratory procedure that simulates water treatment processes to determine the type(s) and dosages of coagulants and other chemicals to meet specific water treatment objectives most effectively. The testing has a short turnaround time (usually 1-3 days) and can be used to evaluate a wide range of treatment chemicals or sorption medias (e.g., oxidants, coagulants, carbon media, ion-exchange resins, etc.) providing a high-level, generalized, understanding of treatment using various treatment conditions. Treatment is conducted on batches, or "jars" of water with subsequent analysis of resulting water quality. Treatment processes that can be simulated include:

- Pre-oxidation
- Coagulation and flocculation
- Sedimentation and dissolved air flotation
- Intermediate oxidation
- Adsorption
- Microfiltration (lab membrane) for particle removal
- Final disinfection

Rapid Small Scale Column Testing

Rapid small-scale column tests (RSSCTs) are a laboratory technique that use granular activated carbon (GAC) or ion-exchange (IX) media to evaluate the effectiveness of contaminant removal by fixed bed adsorbents. RSSCTs are a faster alternative to larger scale pilot testing and can help make decisions about treatment strategies. RSSCTs can have a typical testing duration of 1-3 weeks, but the daily labor required to maintain and operate the tests is not very demanding. Typically, testing

includes a day or two to set up, followed by 1-2 hours per day for a technician to collect samples, record operating conditions, and adjust the process as needed.

Bench Scale Pilot Testing

By collecting water from a PWS and shipping it to UMass (i.e., a 275-gallon tote), we can conduct low-flow (0-1 gpm) pilot testing using specific treatment processes and parameters. These tests allow technicians to adjust and analyze treatment conditions to improve performance, generally resulting in more useful data than jar testing or RSSCT data.

Bench scale pilot tests can assess a range of treatment processes, including (but not limited to): electrochemical, ultra-violet (UV) light, filter media for particle removal, new/novel chemicals, etc.

Mobile Water Innovation Laboratory

On-site pilot-scale treatment services at selected PWS locations can be conducted using the UMass Mobile Water Innovation Laboratory; a fully equipped mobile pilot water treatment system designed to evaluate drinking water treatment technologies on-site and on-demand. Careful planning and design is needed to ensure a successful pilot. Logistics (i.e. access to electrical power, source water supply, and wastewater discharge) must be addressed, in addition to costs associated with the on-site piloting (i.e. lodging, meals, transportation, unforeseen delays).

Questions or interested in these services?
Contact program.director-dwp@mass.gov AND copy drinkingwater@umass.edu, Subject "EC-SDC UMass Lab Services"

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