



Laboratory Highlight: MWRDGC's Calumet Laboratory

by Anas Rabah, Submitted by Becky Rose, Laboratory Chair

The Calumet Analytical Laboratory (CAL) has been operating and providing analytical services to support the Calumet Water Reclamation Plant (CWRP) since the plant was built in 1922. It is one of five laboratories in the Analytical Laboratory Division of the Metropolitan Water Reclamation District of Greater Chicago (MWRDGC). The Stickney Analytical Lab was previously highlighted in the 2015 Spring Clarifier issue.

The CAL is a National Environmental Laboratory Accreditation Program (NELAP) accredited laboratory. It provides analytical services for the MWRDGC using United States Environmental Protection Agency (USEPA) approved methods for testing a wide variety of sample sources, which include:

- National Pollution Discharge Elimination System (NPDES) samples
- Samples from each stage of the treatment process at the Calumet and Lemont treatment plants – influent to effluent and biosolids to ensure that each plant segment is operating at their optimum efficiency.
- Tunnel and Reservoir Plan
- Support to Maintenance and Operations for daily adjustments to plant operations.
- Plant upset investigations
- Combined sewer overflows
- Industrial wastes to assess user compliance and assess user fees
- Research samples to support the district's research initiatives
- Biosolids (40CFR, part 503)
- Ambient water quality monitoring of the Chicago Area Waterways (CAWS) as well as from the Illinois River and Lake Michigan

Six chemists, nine technicians, one lab assistant and one administrative assistant comprise the CAL staff. In 2014,

the CAL ran 255,112 tests on 38,549 samples. Each of these samples are logged and received into our Laboratory Information Management System (LIMS) and distributed to their respective laboratory destinations for analysis.

Some of the analyses performed include:

- Total Solids and Suspended Solids - The weighing of crucibles and dishes are performed using a robotic auto-weighing system.
- pH and Alkalinity analysis is performed using a pH probe and an auto-titration system for alkalinity.
- Carbonaceous Biochemical Oxygen Demand (CBOD5) is automatically calculated in LIMS using Dissolved Oxygen (DO) readings that are performed manually using DO membrane probes.
- Total Mercury is determined by cold-vapor atomic absorption spectrometry. Low-level Mercury is determined by USEPA method 1631E cold-vapor atomic fluorescence spectrometry in a designated clean room. Our detection limit for our 1631E method is 0.5 parts per trillion (ppt)!
- Volatile Acids is performed using a gas chromatograph with a flame ionization detector.
- Total Kjeldhal Nitrogen (TKN), Total Phosphorus, Ammonia Nitrogen, combined Nitrate/Nitrite Nitrogen and Sulfate are all performed using a flow injection analyzer.

The professionals at the Calumet Plant are a very dedicated, skilled and proud team. Recently, the Calumet Water Reclamation Plant was honored with its 23rd consecutive Platinum Peak Performance award for 23 continuous years of 100 percent permit compliance!

Tell us about your lab for the next issue of the Clarifier! Email the Laboratory Chair at Rebecca.rose@mwr.org.