

Wisconsin Department of Natural Resources
Natural Resources Board Agenda Item

SUBJECT: Presentation of the 2013 Laboratory of the Year Award

FOR: March 2103 Board meeting

TO BE PRESENTED BY: Camille Turcotte, Chief of Environmental Science Services Section

SUMMARY:

The Department annually presents the registered Laboratory of the Year award to recognize Wisconsin's best registered laboratories for their outstanding commitment to producing high quality data. Registered laboratories perform testing solely on behalf of their own facility or municipality, or a subsidiary or corporation under common ownership or control. This is the 18th year we will present a Laboratory of the Year award. There were 232 registered laboratories that were eligible to win the award this year.

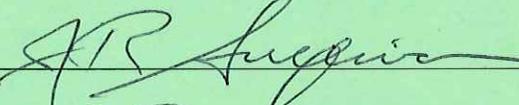
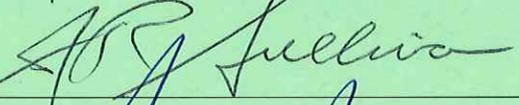
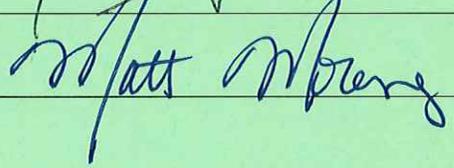
The 2013 Registered Laboratory of the Year award will be presented to the Watertown Wastewater Treatment Plant for the excellent practices in place at their laboratory.

The nomination papers, along with an overview of award selection criteria are included in the attached memorandum.

RECOMMENDATION: Information only

LIST OF ATTACHED MATERIALS (check all that are applicable):

- Background memo N/A
- N/A
- N/A

Approved by	Signature	Date
John R. Sullivan, Bureau Director		2/14/2013
Tim J. Lawhern, Administrator		2/15/2013
Cathy Stepp, Secretary		3/6/13

cc: Board Liaison - AD/8

cc: Camille Turcotte SS17



2013 Wisconsin DNR Registered Laboratory of the Year Instruction and Nomination Forms

The Wisconsin Department of Natural Resources is asking for nominations for registered laboratories that are worthy of receiving the prestigious “Registered Laboratory of the Year (LOY)” award. This award is presented annually* in order to recognize registered laboratories for their outstanding commitment to producing high quality data.

Notes:

- Nominees for the award must be registered laboratories located in the State of Wisconsin.
- Certified laboratories are not eligible and therefore will not be considered.
- Laboratories may be nominated multiple times and can win the award more than once.
- A LOY awards committee will choose the winner.
- Nominations can be made by anyone with the exception that laboratories may not nominate themselves.
- The report from the most recent WI DNR audit of the laboratory will be used as part of the nomination package.

Nominating a registered laboratory for the 2013 Laboratory of the Year Award:

1. Complete the Nomination Form presented on the next two pages of this document.
2. Write a summary describing the reasons why you are nominating the laboratory. In the summary, please address the questions asked. Answers to these questions will be used in choosing the winner. Each question may not apply to all labs. If a question does not apply then it does not need to be answered. Please limit the summary to two pages or less.
3. Please submit the completed Nomination Form to Tom Trainor by **January 4, 2013** to:

By mail Wisconsin DNR
Laboratory of the Year Award
c/o Tom Trainor
2984 Shawano Avenue
Green Bay, WI 54313

By email tom.trainor@wisconsin.gov

By fax 920.662.5159

* The Laboratory Certification and Registration Program reserves the right to decide if awards will be issued or not.



2013 Wisconsin DNR Registered Laboratory of the Year Nomination Form – Lab Data Sheet

Due January 4, 2013

Name of Laboratory	City of Watertown Wastewater Treatment Plant
Laboratory Manager	Kyle Mealy
Key Laboratory Employees	Paul Lange, Water Systems Manager and Kevin Freber, Assistant Water System Manager
Laboratory Address	800 Hoffmann Drive, P.O. Box 477 Watertown, WI 53094-0477
Laboratory Phone Number	920-262-4085
Nominator (your name)	George Bowman
Your Affiliation with Laboratory	No affiliation with this laboratory. However, I audited their facility in May 2012.
Your Address	WI DNR, SS/7 P.O. Box 7921 Madison, WI 53707-7921
Your Phone Number	608-219-6285
Your Email Address	georgebowman@wisconsin.gov
Is a 1-2 page summary attached that answers the questions asked on the next page?	Yes

Nomination Form – Question / Answer sheet
for the WDNR 2013 Laboratory of the Year Award:

Please provide an answer for each one of the questions listed below (unless it is not applicable)

Limit your reply to these questions to 2 pages

1. Quality Control

Discuss the laboratory's Quality Control (QC) system. Be sure to include the frequency of quality control samples, QC acceptance criteria, and how the lab uses QC results to improve the laboratory. Describe how frequently the lab has QC failures and what actions they take to address them.

The laboratory's Quality Control Program (Quality System) encompasses a wide range of checks and balances. Some of the QC practices include the analysis of second source lab control standards (LCS) in addition to the calibration standards each time ammonia analyses are performed, and a second source LCS with the continuing calibration verification standard (CCV) each time total phosphorus analyses are performed. The QC acceptance criteria are clearly listed on the facility's bench records as reminder to all lab technicians along with a positive indication on whether criteria pass or fail, and detailed corrective action records when there is a failure. They also participate in a quarterly blind standard program which is not required since they analyze second source standards. This is a very good practice. Few of the laboratories I have audited in the last 2 years analyze both second source standards and the quarterly blind standards.

The facility has a contract with an external metrology company to calibrate their thermometers, balance, weights, spectrophotometer, and plant equipment annually. The external check is an outstanding preventive maintenance practice which allows the laboratory catch problems before equipment fails and compromises data quality.

The Lab Manager reviews each bench sheet to verify QC criteria are met and the results are entered in the facility's database system immediately thereafter. Test results are reviewed by the Lab Manager and the Assistance Water Systems Manager before any data are reported on the DMRs. The bench record check and review prior to submitting the DMR are practices that help ensure only data of a known quality are reported to the Department.

The Lab Manager performs an annual "self-audit" much like the one done by the Laboratory Certification Program staff. The goal of the self-audit is to ensure the laboratory is complying with the provisions of the Laboratory Certification Program. This is an outstanding practice. I am not aware of any other registered laboratory that uses this practice.

2. Record-keeping

Discuss the systems and procedures the lab uses to ensure excellent records are maintained. Be sure to describe the lab's process for tracking analytical data, reagents/standards, equipment maintenance, and corrective actions in addition to their general practices.

Bench sheets are used to capture all raw data, dilutions, clear links to the reagents, calibrations, intermediate and working standards, QC criteria for outstanding traceability. In most cases the bench sheets have a positive assessment of whether QC criteria are met. Bench sheets are permanently bound in split-ring binders by month, labeled with a coversheet and stored in file cabinets in a separate file room adjacent to the laboratory. The file room is locked independently

from the rest of the laboratory. Reagents, stock intermediate and working standards are tracked in an Access database created by the laboratory. The database can easily be queried using the reagent code from any bench sheet to immediately recover all threads linking a reagent or standard to the original manufacturer's lot and to all preparatory steps. Equipment and maintenance logs are detailed, providing specifics on what, when and who performed the maintenance. Logs also describe the effectiveness of the service or maintenance.

Corrective actions are also tracked on a database. This allows the Lab Manager to assess effectiveness of corrective actions and whether there are any recurrent QC failures. In 2012, the Laboratory Manager used the correction records to systematically isolate the source of an intermittent phosphorus contamination problem observed when performing the total phosphorus test. He also used this information to prove to the manufacturer that a specific lot number of the sulfuric acid tubes in the total test kits were contaminated. The company replaced the affected lot without hesitation because the laboratory had clearly documented proof. This not only saved the laboratory the time and frustration of trying to resolve the problem but also saved the laboratory several hundred dollars in reagents. Their corrective action practices epitomize the goal of the corrective action provisions of the laboratory certification code.

3. Quality Manual/Standard Operating Procedures (SOPs)

Describe the laboratory's Quality Manual and SOPs and how they are utilized. Detail how often they are updated and how tailored they are to what is actually done in the laboratory.

The laboratory's Quality Manual is detailed and written in an understandable format. Practices described in the Manual are actually followed. Many registered laboratories use the Quality Manual template developed by Lab Certification Program (Lab Cert) as a guide in preparing their own manual. However, most leave the Lab Cert references but do not follow the practices.

The SOPs are written in a "cookbook" format for ease in using. They include SOPs for calibrating the DO probe and pH meter, for preparing calibration standards and curves. They are written with enough detail that operators and lab technicians can easily perform the task. The SOPs are some of the best I've seen in my 39+ year career. The Quality Manual and SOPs are updated annually. Operators assigned to lab duties are required to read updates before performing any test they had not done since their last laboratory rotation.

4. Other Practices

Describe any other practices the laboratory follows that improves their lab performance and the quality of the data they are generating. Discuss why this laboratory deserves the Laboratory of the Year award.

The laboratory uses signs and posted instructions to ensure tasks are performed properly and consistently from lab technician to technician. Examples include instructions with graphics showing how to calibrate the DO probe, strip excess DO from BOD samples, how to calibrate the pH meter, when samples are to be removed from the BOD incubator. The instructions are particularly useful for the operators assigned to the weekend lab rotation (the infamous "weekend folks"). A check-list is also posted to make sure monthly, quarterly and annual QC checks are to be performed. This process ensures consistency among analysts which is required if data of a known and high quality are to be generated by the laboratory. This is just a sampling of some of the outstanding practices this laboratory uses to ensure quality in all laboratory testing. I highly recommend this laboratory for the Laboratory of the Year Award.

State of Wisconsin
DEPARTMENT OF NATURAL RESOURCES
101 S. Webster Street
Box 7921
Madison WI 53707-7921

Scott Walker, Governor
Cathy Stepp, Secretary
Telephone 608-266-2621
FAX 608-267-3579
TTY Access via relay - 711



May 17, 2012

FID: 128002490

Watertown Wastewater Treatment Plant
Mr. Kyle Mealy
P.O. Box 477
Watertown, WI 53094

SUBJECT: Laboratory Evaluation and Closure (04/24/2012)

Dear Mr. Mealy:

I conducted an on-site evaluation of your laboratory on April 24, 2012 to determine compliance with Chapter NR 149, Laboratory Certification and Registration, Wisconsin Administrative Code. Enclosed is a report that summarizes the observations I made while at your laboratory.

Normally, the laboratory would be required to resolve, and provide a response, for each deficiency identified in the report. The initial response would have been required to be received within 30 days of the date on the report letter. Due to the fact that no deficiencies were identified, a response from the laboratory is not required.

I would like to thank Kevin and you for your time and assistance during the evaluation. I enjoyed working with you both. As you read my observations and summaries, if you notice that I misunderstood any of your practices, please let me know so I can note the corrections in the file.

If you have any questions about this report or any other lab issues you can reach me by email or by phone at 608-219-6285. Since there were no deficiencies identified at this evaluation this letter will also serve as the closure letter.

Sincerely,

George
Bowman

Digitally signed by George
Bowman
DN: cn=George Bowman, o=WI
DNR, ou=Lab Certification
Program,
email=bowmag@wisconsin.gov,
c=US
Date: 2012.05.18 09:43:37 -05'00'

George T. Bowman
Contract Audit Chemist
george.bowman@wisconsin.gov

cc: Amy Schmidt DNR (GEF2-Madison)

Report of On-Site Evaluation
For
Compliance with Chapter NR 149,
Laboratory Certification and Registration
Wisconsin Administrative Code

Of

FID: 128002490
Watertown Wastewater Treatment Facility
800 Hoffmann Drive
Watertown, WI 53094

By

George Bowman
Audit Chemist
Bureau of Science Services
Wisconsin Department of Natural Resources

101 S. Webster Street
Madison, WI 53707

April 24, 2012

OVERVIEW

The Watertown Wastewater Treatment Facility (WWTF) laboratory was evaluated for compliance with NR 149 on April 24, 2012. It was last evaluated on March 26, 2009. The Watertown WWTF is a registered laboratory. Paul Lange is the Water Systems Manager and Kevin Freber is the Assistant Water System Manager. Kyle Mealy is the Laboratory Manager, primary analyst and is in charge of the laboratory. Therese Oie is the lab assistant and is the primary backup analyst. Mike Hawes, Dan Schultz, Jim Arndt, Bob Svatos, Jeff DeWitt and Rich Padron are operators that provide weekend coverage in the laboratory for BOD, TSS and pH testing. Bob Syatos does daily ortho-P measurements for process control. Kyle enters the results in the e-DMRs, and Kevin reviews and approves (signs) and electronically submits them to DNR.

Influent samples are collected for BOD and TSS five times a week, total recoverable copper monthly, and total recoverable cadmium, chromium, lead, nickel, zinc and mercury, quarterly. Effluent samples are collected for BOD, TSS, total phosphorus (TP) and ammonia (NH₃-N) five times a week, and total recoverable copper weekly, and total recoverable cadmium, chromium, lead, nickel, zinc and mercury, quarterly. The metals are tested by facility's contract laboratory. The TP and NH₃-N are preserved with sulfuric acid and stored in a refrigerator at $\leq 6^{\circ}\text{C}$. The facility tests the TP and NH₃-N samples in batches, generally every week. The 20th Edition of Standard Methods is used as follows: 5210B for BOD, 2540D for TSS, Hach T-N-T method 8190 (SM4500-P B (5) and E) for TP and 4500-NH₃ F for ammonia

The evaluation process necessitates that the following report focus on deficiencies and recommended improvements. However, I did observe many positive practices at this laboratory. The analyst is doing an excellent job with the laboratory. Some of the great things identified at this laboratory were:

- The overall laboratory design and layout is outstanding; one of the best I've seen.
- The laboratory manager conducted a "self-audit" prior to the on-site evaluation as prescribed under s. 299.11, Stats. This is outstanding practice is rarely seen in wastewater laboratories.
- Stock reagents, working standards and preparation records are maintained in a searchable database. The search feature for preparation records was implemented in 2011.
- Instructions for many activities are posted at various locations in the laboratory to ensure consistency among analysts.
- All logs had QC tolerances listed directly on them which is an outstanding approach
- The facility has a contract with an external metrology company to calibrate their thermometers, balance, weights and other plant equipment annually. The calibration report is outstanding.
- The pipette calibration records are outstanding.
- The laboratory binds their bench records monthly and stores them in a secured file room.
- Stocks, working standards and reagents are linked to bench records for outstanding traceability records.
- Mr. Mealy and Mr. Freber were very easy to work with and willing to consider recommendations

The deficiencies described in this report are those that were observed during the on-site evaluation and may have been corrected or otherwise addressed in the ensuing time between the evaluation and the receipt of this report. Performing a laboratory evaluation in the course of only a single day limits its scope; therefore, other deficiencies may exist in the laboratory. Their omission from the report does not imply acceptance by the Department. The laboratory is urged to correct all deficiencies even if some of them were not noted in this report.

George
Bowman

Digitally signed by George Bowman
DN: cn=George Bowman, o=WI DNR,
ou=Lab Certification Program,
email=bowmaga@wisconsin.gov, c=US
Date: 2012.05.18 09:43:58 -0500

Approved by: Camille Turcotte, Chief of the Environmental Science Services Section

I. FACILITIES and EQUIPMENT

All instruments and equipment appear to be in good working order. Calibration records for thermometers, balance, weights, mechanical pipettes and other laboratory instruments and equipment are clearly documented. QC criteria for equipment and instruments are posted to ensure consistency among analysts. The laboratory itself has very good temperature and humidity control.

No significant deficiencies were identified

II. SAMPLE HANDLING

The laboratory organized their sample processing and cleaning area based on level of cleanliness from dirty to clean along approximately 12 feet of linear bench space. Composite samples are split in the "dirty" area immediately after collection in an appropriate manner. Samples for $\text{NH}_3\text{-N}$ and TP are preserved with sulfuric acid to a pH of <2 immediately after splitting. The sample pH is checked with short range pH paper regularly. A daily chain-of-custody form (COC) is completed. Samples and reagents are stored in separate refrigerators. Prior to 2011, the laboratory did not have a procedure in place which addresses concerns that sample containers are adequately cleaned and are not contributing to contamination of samples. This would have been a deficiency had the laboratory not taken corrective action prior to this on-site evaluation.

No significant deficiencies were identified

III. QUALITY MANUAL and SOPs

The quality manual addresses all elements specified in NR149.37(3). The laboratory has methods and separate "Cook Book" SOPs for BOD, TSS, TP and $\text{NH}_3\text{-N}$ that address all code requirements. (NR149.40(2)).

No significant deficiencies were identified.

IV. TRACEABILITY and RECORDS

Bench sheets have clear links to reagents and standards used during testing. QC limits are also documented on the bench sheets. Many records, including but not limited to, reagents, standards, preparation records, QC limits and corrective actions are stored in a database. All electronic records are backed up daily on a server at the facility.

No significant deficiencies were identified

V. QUALITY CONTROL

The laboratory has a policy for initial demonstration of capability (IDCs) that includes full training records. Corrective action records are detailed and maintained in a searchable database. The laboratory currently analyzes spikes, replicates as wells as second source laboratory control samples.

No significant deficiencies were identified.

VI. TEST REPORTS

The laboratory uses consistent qualifiers to flag facility and laboratory problems on the DMRs. It was noted that the majority of the facility's metals results tested by their contract laboratory in the last 3 years were flagged for multiple QC failures. The laboratory recently went to a different contract laboratory.

No significant deficiencies were identified

VII. TECHNOLOGY (METHOD) - ANALYTE

A. OXYGEN DEMAND ASSAYS - BOD

The laboratory is using a YSI model 5100 DO meter and self-stirring DO probe. The DO probe is manually calibrated using a water saturated air technique. Calibration instructions are posted directly above DO meter. The barometric pressure is obtained directly from the National Weather Service monitoring station located on-site. The pressure is uncorrected to the elevation of the plant and used to determine the DO saturation value that is used to calibrate the DO probe. Prior to 2011 the laboratory had super-saturation problems. Frequently during the spring, fall and winter months, initial DO readings on effluent BOD samples were above saturation (i.e., >9.0 mg/L) prior to incubation. This would have been a deficiency had the laboratory not taken corrective action prior to the on-site evaluation

No significant deficiencies were identified

B. COLORIMETRIC – TOTAL PHOSPHOURUS

The laboratory performs TP testing using Hach method 8190 TNT technique (SM4500-P B (5) and E). Two LCS/CCV standards are analyzed with each batch of TP tests. The laboratory also performs spikes and duplicates with each batch of samples. Prior to 2011, the Hach TNT vials were washed and reused instead of using new TP TNT vials (reagent sets). TNT vials may not be reused since each vial is a designed as a single-use, optical quality glass spectrophotometer cuvette. This would have been deficiency had the laboratory not taken corrective action prior to the on-site evaluation.

No significant deficiencies were identified.

C. ELECTROMETRIC ASSAYS – NITROGEN AMMONIA

The laboratory performs spikes and duplicates each time analyses are performed. The laboratory performs spikes and duplicates. The laboratory attempts to match the spike level within 1 to 5 times the sample concentration. The effluent NH₃-N concentrations are often very low; <0.1 mg/L. Consequently, spike levels are at or below 0.2 mg/L and the laboratory has difficulty obtaining acceptable recoveries at times. The laboratory was advised to spike at higher level or discontinue spiking altogether during the on-site evaluation.

No significant deficiencies were identified.

D. GRAVIMETRIC ASSAYS – TOTAL SUSPENDED SOLIDS

The facility uses Environmental Express GF (1.5 μm) filters for TSS testing. These filters are equivalent to 934 AH filters and are appropriate for TSS testing. Samples are always dried overnight.

No significant deficiencies were identified.