Form 1100-001N (Rev. 10/12)

Wisconsin Department of Natural Resources
Natural Resources Board Agenda Item

Item No. 3.A.1.

SUBJECT: Presentation of the 2015 Laboratory of the Year

FOR: February 2015 Board meeting

TO BE PRESENTED BY: Steve Geis, Chief of Environmental Science Services Section

SUMMARY:

The Department annually presents the registered Laboratory of the Year Recognition to 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 20th year we will recognize a Laboratory of the Year. There are over 200 registered laboratories that were eligible to win the award this year.

The 2015 Registered Laboratory of the Year Recognition will be presented to the Ripon Wastewater Treatment Plant.

The nomination papers are included in the attached memorandum.

RECOMMENDATION: Information only

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

- ☐ Background memo
- ☐ Type name of attachment or type N/A if not applicable
- ☐ Type name of attachment or type N/A if not applicable
- ☐ Type name of attachment or type N/A if not applicable
- ☐ Type name of attachment or type N/A if not applicable

Approved by	Signature	Date
John R. Sullivan, Bureau Director		1/15/15
Mark Aquino, Administrator		1/15/15
Cathy Stepp, Secretary		2/3/15

cc: Board Liaison – AD/8

2015 Wisconsin DNR Registered Laboratory of the Year Nomination Form – Lab Data Sheet

Due December 5, 2014

Name of Laboratory	**Ripon Wastewater Treatment Facility**
Laboratory Manager	**Jack Wendler**
Key Laboratory Employees	**Jack Wendler and Brandon Mickleson**
Laboratory Address	**560 Aspen St. Ripon, WI 54971**
Laboratory Phone Number	**(920) 748-4902**
Nominator (your name)	**John Condron**
Your Affiliation with Laboratory	**I performed the 2014 on-site laboratory evaluation and close**
Your Address	**John Condron; WDNR; 3911 Fish Hatchery Rd. Fitchburg, WI 53711**
Your Phone Number	**(608) 275-3328**
Your Email Address	**john.condron@wisconsin.gov**
Is a 1-2 page summary attached that answers the questions asked on the next page?	**Yes, in the previous email to Steve Geis**

Nomination Form – Question / Answer sheet for the WDNR 2015 Laboratory of the Year Award:

Please provide an answer for each one of the questions listed below (unless it is not applicable). Specific examples are always helpful.

Limit your reply to these questions to 2 pages

1. Does the lab have a strong, working quality system? [*Discuss what makes that system effective and stand out.*]

   The DNR asked Ripon wastewater laboratory to help write an example quality assurance manual in approximately 1985 that would be a sample of other wastewater testing laboratories to base their own quality manual on. Ripon wastewater laboratory co-wrote the Quality Assurance Document for a Small Wastewater Treatment Plant (1985) along with Tom Mugan and others in the DNR.

   The city is currently achieving extremely low effluent phosphorus concentrations, levels that are likely the lowest in the state for a municipal treatment plant. To achieve these low levels, quite a bit of extra lab analysis, experimentation, and quality control testing is required.

2. How does the lab respond to quality system "failures"? [*Discuss what triggers the lab to take action.*]

   Example 1: BOD

   When dilutions on influent samples deplete <2.0 mg/l D.O. on all dilution series for two consecutive days the sample volume is increased and documented in the corrective action log book (CALB).

   When dilutions on the effluent samples deplete <2.0 mg/l D.O. on all dilution series for two consecutive days the sample volume is increased and documented in the CALB. The reverse happens (sample volume decreased) if influent and effluent samples deplete all D.O. on all dilution series for two consecutive days and documented in the CALB.

   The reason for two day response time is due to variability on weekend vs. weekday influent loadings. When duplicates on influent and effluent are run and are out of control, a second set is run and documented in the CALB.

   When the GGA (lab BOD standard) is consistently low (but in control) a check on the expiration date is done. If out of control the GGA is disposed of, a new bottle opened and put into the system. All actions are documented in the CALB. The BOD incubator is set to control temperature at 20* C plus or minus 2 degrees with an alarm set points. If alarm sounds investigation occurs. All actions taken are documented in the CALB.

   Example 2: Total Phosphorus

   When color development occurs in the reagent blank a check on the cleaning procedure is done. If persistent, reagents are checked for expiration dates. If issue still occurs distilled water is checked by outside labs. All actions are recorded in the CALB.

3. Does their corrective action program conform to the Plan-Do-Check-Act approach, or something else? [*Describe the lab's model for corrective action and whether it incorporates proactive checks, feeds back to the analysts, and results in continuous improvement.* Please provide an example.]

   Ripon wastewater laboratory uses science-based decision making to run its wastewater treatment plant (WWTP).

4. Does the quality system consider things beyond failure of quality control samples?

   In 1989, Ripon wastewater laboratory responded to requests of citizens of Ripon about fecal coliform in Silver Creek which is where the Ripon WWTP discharges into. From 1989 – 1992, Ripon wastewater laboratory performed Wisconsin approved wastewater test method testing to do *extra* fecal coliform testing upstream from the WWTP discharge, at the point in Silver Creek where the WWTP discharges, downstream from the point of WWTP effluent discharge, and just upstream from Green Lake (downstream from WWTP). (Only effluent discharge fecal coliform testing is required). Green Lake has many recreational uses and on the shores of Green Lake is the location of a popular resort. Citizens were assured that Ripon WWTP was not adding fecal coliform to Silver Creek or Green Lake.

5. Do they have any unique practices to proactively avoid problems?

   In the last couple years, Ripon wastewater laboratory decided to voluntarily see how it could remove more phosphorus from its wastewater effluent. Ripon wastewater laboratory initiated an intensive study on how to obtain biological treatment of its wastewater to consistently attain low level phosphorus concentrations of 0.05 – 0.06 mg/L on a daily basis without adding chemicals to the wastewater. Ripon does it by controlling only the dissolved oxygen (DO) in the treatment plant process. (This is in contrast to other WWTPs which tend to add chemicals to the wastewater to remove phosphorus). It controls the DO in the process by monitoring the oxidation and reduction potential (ORP). This is no longer a pilot study because Ripon WWTP and laboratory are using the practices it developed every day. Ripon WWTP and laboratory has submitted day to day recommendations for other wastewater treatment plants to follow and submitted this to Amanda Minks of the DNR in March 11, 2014. After I asked Jack if he would share these practices with the DNR, Jack enthusiastically agreed to do this. Jack sent data and information on how it could biologically remove phosphorus to a very low level.

6. Do they have any innovative solutions to common lab problems?

   Ripon wastewater laboratory initiated a meeting with the Ripon WWTP administration, Jack Wendler, and the DNR. Jack consulted Standard Methods for the Examination of Water and Wastewater (Standard Methods) and proposed BOD/CBOD study by Ripon to prove that nitrification of BOD was occurring. Jack actually found an option to do CBOD testing if it could be proved that nitrification was occurring. I am not aware of many other wastewater laboratories that study and comprehend many of the methods in Standard Methods as well as Ripon wastewater laboratory does.

7. Is the lab successful because of a single (or small number of) analyst(s), or is it because of a corporate/municipal culture and support system?

   Jack Wendler is the primary lab analyst, and is the most conscientious lab analyst I have worked with in my career at the Department. (Mark Stanek)

This laboratory partners with Ripon College by coordinating 3 plant tours a year with its professors and students so as to study and share their knowledge of microorganisms involved in wastewater treatment. Ripon wastewater laboratory also partners with the City of Ripon and other wastewater treatment laboratories including Fond du Lac and Rosendale wastewater testing laboratories.

8. Describe the lab's training program for new staff. [*If there was a major staff changeover, is there a sufficient trail of bread crumbs to guide the replacements*?]

   Over the last 2-years the city had to replace numerous staff due to retirement. This included their plant superintendent, and plant operators that also perform laboratory analysis.

   When new staff personnel are hired they are provided a quality manual respecting lab procedures at the facility along with supervised hands-on training on all aspects of laboratory procedures. This is done over time as to not overwhelm new staff. New staff attend outside training for laboratory QA/QC programs as well.

   As part of the training process new staff are given hypothetical situations that may occur in an analysis and asked how to solve them. New staff are asked to keep a journal as to lab/plant operations for future reference.

9. Does the lab communicate with DNR staff when issues/questions arise? Give examples *(check with other LabCert staff members as they may have contact with the lab as well).*

   Examples that Ripon wastewater laboratory has been an outstanding partner with the DNR go back to at least 1985. The DNR asked Ripon wastewater laboratory to help write an example quality assurance manual that would be an example to other wastewater testing laboratories to base their own quality manual on. Ripon wastewater laboratory co-wrote the Quality Assurance Document for a Small Wastewater Treatment Plant (1985) along with Tom Mugan and others in the DNR. (Since it had a red cover, it was called "the red book"). In fact, this sample quality assurance manual was so good, that it was updated three times until 2008. (In 2008, the quality assurance manual had to be rewritten from scratch since the chapter NR 149; Wis. Adm. Code underwent a major upgrade.

10. Has the lab made significant strides since its last audit? [*Does the lab deserve special consideration for its efforts to improve or overcome difficult circumstances? Give examples.*]

    No information was provided addressing this question.

11. What makes this lab stand out from others?

    In the fall of 2014, Ripon wastewater laboratory actually used laboratory testing results as an outreach to the community for seven additional monitoring locations that are not required in its WPDES permit. The phosphorus test results indicate that the City of Ripon and the Ripon WWTP has little if any impact on the phosphorus concentrations in Silver Creek. This extra testing included sampling upstream from the WWTP discharge, the Silver Creek discharge point, downstream from the discharge point, and just

upstream from Green Lake. These test results also proved that Ripon WWTP and lawn fertilizers are not adding to the phosphorus in Silver Creek at the locations where samples were collected.

Ripon wastewater laboratory also partners with other wastewater treatment laboratories including Fond du Lac and Rosendale wastewater testing laboratories. This laboratory partners with Ripon College by coordinating 3 plant tours a year with its professors and students so as to study and share their knowledge of microorganisms involved in wastewater treatment.

The city is currently achieving extremely low effluent phosphorus concentrations, levels that are likely the lowest in the state for a municipal treatment plant. To achieve these low levels, quite a bit of extra lab analysis, experimentation, and quality control testing is required. The city has a very cooperative relationship with the Department, and they have always been receptive to trying new ways of doing things in the laboratory and at the treatment plant.

CORRESPONDENCE/MEMORANDUM

State of Wisconsin

DATE: 12/03/14

TO: Steven Geis – GEF 2/SS

FROM: Mark Stanek – WNDR Oshkosh

SUBJECT: LOY Nomination for the City of Ripon

I am the Wastewater Engineer that oversees compliance for the Ripon Wastewater Treatment Facility. I work directly with Jack Wendler who is the primary lab analyst and also one of the operators at the treatment facility. I have worked very closely with the city of Ripon and Jack Wendler over the years as they have strived to maintain compliance with the city's WPDES permit. Over the last 2-years the city had to replace numerous staff due to retirement. This included their plant superintendent, and plant operators that also perform laboratory analysis. Jack has succeeded in keeping the laboratory and the treatment plant running at a high level. Treatment plant performance has even improved due to better quality control over operations and implementation of major maintenance projects.

The city of Ripon has an average discharge of 1.5 million gallons per day to Silver Creek, which is the main tributary to Green Lake. The City of Ripon is required to meet very stringent effluent limits as required by its WPDES discharge permit, which makes plant operations all the more sensitive. The city of Ripon's WPDES was recently reissued and the permit reissuance process was extremely complex and it took almost 4-years. It was a pleasure working with Jack Wendler and the staff at the treatment facility as we dealt with very complicated issues related to the new phosphorus and thermal rules, along with chloride reduction requirements. The city is currently achieving extremely low effluent phosphorus concentrations, levels that are likely the lowest in the state for a municipal treatment plant. To achieve these low levels, quite a bit of extra lab analysis, experimentation, and quality control testing is required. The city has a very cooperative relationship with the Department, and they have always been receptive to trying new ways of doing things in the laboratory and at the treatment plant. Ripon will be undergoing a dissipative cooling evaluation that will require stream monitoring, and that work will be performed by its staff.

At least half of the organic wastewater loading entering the treatment facility comes from industrial users. The variability of the influent loading constantly challenges the operators. I cannot over emphasize how important of a role Ripon's laboratory is in providing quality data to its operators for process control. Of special note is the amount of nutrient analysis that is performed at the lab in order to maintain the proper nutrient ratio's for the biological treatment process.

The city of Ripon performs industrial user surveys as part of regulating its large number of industrial users. As part of these surveys, the laboratory and treatment plant staff are responsible are responsible for sample collection and analysis.

Jack Wendler is the most conscientious lab analyst I have worked with in my career at the Department and I strongly support the nomination of the city of Ripon for the Lab of the Year Award in the Small Category.