

BASIC GUIDANCE FOR APPLYING FOR A COPPER VARIANCE (1/30/02)

This document is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations, and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Introduction

OK, so you've tried everything else to try to meet copper limits that have or will be placed in your permit.

- You are testing on a regular basis to get a good feel for what effluent limits your plant can meet.
- You made sure your testing is accurate, including testing field blanks to eliminate copper contamination in your samples.
- You've looked for sources of copper to your collection system and done what you can to eliminate those sources. You've approached source identification scientifically by doing influent and collection system monitoring.
- You've made sure that there is adequate hardness information on the receiving stream below your discharge. If you know effluent hardness and upstream hardness, sometimes a mix-hardness calculation, that could justify higher limits, is appropriate.
- You investigated dissolved metals limits and that option either resulted in no relief or not enough to allow you to meet those limits either.
- You investigated other possible ways to justify higher limits, such as an increased mixing zone.

Your almost last resort may be to consider a copper variance.

Section 283.15, Wisconsin Statutes, provides a procedure whereby you can apply for a variance to water quality standards. This is a very prescribed process and, because of specified time periods for information submittal, processing and public notice, the process can take up to about 12 months to complete. To date, permittees have requested variances for copper more than any other substance.

The purpose for this guidance paper is to help you through the process of applying for a copper variance. We hope that, in the simplest situations, a permittee with some amount of diligence can apply for a variance without the need to hire an engineering consultant. This guidance primarily applies to municipal-type wastewater treatment facilities.

Copper Treatment

Municipal treatment systems designed to remove BOD and solids from wastewater also remove metals. The efficiency of metals removal depends on some of the same factors that control removal for BOD and solids. These factors include type of treatment system (mechanical plant versus ponds or lagoons) and operational controls. Except at the time a new facility is designed, operators have no control over the type of process used. However, the operational control operators use to optimize treatment for BOD and solids (for example, mode of operation, solids removal, etc.) should also improve metals removal.

For all copper variances granted thus far, the Department has concluded that it is not cost-effective to construct special processes to remove metals. Physical-chemical precipitation methods historically used to treat higher-concentration industrial wastes would be extremely expensive to construct and operate for treating large volumes of domestic wastewater containing relatively low concentrations of metals.

Copper Sources

Copper at municipal treatment plants comes primarily from two sources.

- Contributions from industrial contributors to the treatment plant collection system - The recommended solution in dealing with industrial contributors is to determine if the amount of copper contained in those discharges is significant and work with the industries to minimize the release of copper.
- Corrosion of copper piping in water supply plumbing systems - Controlling corrosion may or may not be a simple matter. Many water supplies in northern Wisconsin, where hardness is often low, are corrosive. Usually, raising the pH of water to between 7.6 and 8.0 is an effective way to control corrosion. Many municipal community water supplies do this by adding sodium hydroxide (caustic soda) to the water as it leaves the well house. However, even where effective corrosion control is practiced, copper levels in domestic wastewater often range from 30 to 100 µg/L.

Formula for Success

Based on history, the Department is most likely to approve a copper variance if:

- You have investigated industrial or commercial sources of copper and you can demonstrate that there are no significant non-domestic contributions.
- Your water supply is relatively non-corrosive either without treatment or following the treatment you provide.

You must apply for a variance within 60 days following the reissuance of the permit. However, the process will be much smoother if you begin to assemble information and collect monitoring data in anticipation of that deadline. For example, monitoring data collected over a period that accounts for seasonal changes (12 months) is ideal. If that is not possible, start the process as early as you can.

Contact your DNR Representative or Tom Mugan with questions.

COPPER VARIANCE APPLICATION FORM FOR MUNICIPAL PERMITTEES

Section 283.15, Wisconsin Statutes requires that a permittee who wishes to apply for a variance shall submit an application for a variance within 60 days after the department issues, reissues or modifies the permit. **This form is not required** but is provided to help applicants provide complete submittals. Attach additional sheets if needed for full explanations.

1. Permittee name _____
Contact name _____
Mailing address _____
Permit number _____ Date permit was issued _____

2. Effluent limits (list all that apply)
Daily maximum - _____ $\mu\text{g/L}$ _____ lbs/day
Weekly average - _____ $\mu\text{g/L}$ _____ lbs/day

3. Supply monitoring data (You may use attached Monitoring Data Table to report data). Be sure to attach the laboratory data quality submittal from your lab.

4. Treatment changes - What changes could be made that might enhance treatment for copper.

Estimated costs of these changes \$ _____
How did you estimate costs? _____

5. Industrial contributors to the wastewater collection system (you may use attached Collection System Monitoring Data Table to report monitoring data)

Are there industrial contributors of copper? _____
If no, how do you know? _____
If yes, provide details (include attachment if more than one entity)
Industry name _____
Type of industry _____
Average flow from industry _____
Average concentration of copper in discharge _____

6. Contributions from corrosion of water supply piping in service area - Please describe the water supply or supplies (municipal wells, private wells, combination of municipal and private wells, surface water).

For each source, indicate if the water supply receives chemical or other treatment and provide measures of the corrosive characteristics (pH, alkalinity, hardness, or results of a stability index). If data for corrosive characteristics are not available, it would be good to take samples for testing for those water quality characteristics.

<u>Source</u>	<u>Describe Treatment</u>	<u>Corrosive characteristics</u>
_____	_____	_____
_____	_____	_____

7. Sludge levels - Please supply sludge copper levels (mg/Kg) for the last 5 years. If you have a pond or lagoon system, supply any results of testing for copper.

<u>Year</u>	<u>Test 1</u>	<u>Test 2</u>	<u>Test 3</u>	<u>Test 4</u>	<u>Yearly Average</u>
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

8. Whole effluent toxicity - If you test for whole effluent toxicity (WET), have you had failures that could be attributed to metals toxicity? _____ If yes and you have a WET permit limit, do you wish to request a variance for WET as well as copper? _____
9. Interim limits - The Department will use a statistical calculation to set limits that you can currently meet. Are there actions that you plan to take in the next few years that will reduce copper concentrations in your effluent? _____ If yes, please explain.
10. Other information - Please supply here any other evidence or explanations of why you believe you should be granted a copper variance. Attach additional sheets, if necessary.
11. Certification by Authorized Representative - You need to somehow certify the information you are submitting. You may use the following:

I certify that the information contained in this document and all attachments was gathered and prepared under my supervision and based on inquiry of people directly under my supervision that, to the best of my knowledge, the information is true, accurate and complete.

Signature of Authorized Representative Date

Title _____
Phone # _____
Address _____

COLLECTION SYSTEM MONITORING DATA TABLE

Date	Collection system location (describe location fully below)	Result ($\mu\text{g/L}$)

Describe collection system locations:

Instructions for completing Copper Variance Guidance Application Form
(No instructions are given for self-explanatory items.)

Important - To submit an application means that the Department must **receive** the application by the deadline (60 days from the date of permit issuance).

Item 3. If possible, put data into tables like the one attached to the form, showing dates, location (influent, effluent) and units of measurement ($\mu\text{g/L}$). Influent testing is almost as important as effluent testing. Show results of field blanks or other quality control samples.

Indicate if samples are grab or 24-hour composite. If using composite sampling, carefully clean all surfaces that contact the samples and then test field blanks (A field blank is a volume of reagent grade water which is handled in such a way so as to duplicate as closely as possible the exposure of a water sample to potential sources of contamination during sampling, preservation and transportation to the laboratory.) to be sure that you have eliminated significant sources of contamination. This is most critical for effluent samples where contamination commonly leads to a 5 or 10 $\mu\text{g/L}$ bias.

You should submit a significantly large body of data. If the Department decides to grant a variance, the variance limit is normally set at a level that you are currently meeting. The Department normally calculates that level using a statistic that relies on at least 11 effluent results that are representative of current conditions at the plant. You should consider 11 as an absolute minimum number of results. Samples should be collected no closer together than 3 days apart and should be spaced as equally as possible over the total time period covered. Ideally the time period should span at least several seasons. Indicate when changes took place that may have affected data quality or caused trends in the data.

Supply the following language from NR 200.22 (1) (e) 6. a. and b. to your laboratory performing your metals testing and make sure they provide to you the information described so you can include it with your application.

In addition, for this data to be considered to be representative, the permittee shall supply information to demonstrate that:

a. Sample results fall above the limit of quantitation for the analytical method used or that the most sensitive approved analytical method listed for the pollutant in ch. NR 219 was used with proper technique to produce the results.

b. Proper laboratory quality control procedures were used to generate the data. To make this demonstration, the permittee shall supply, for several representative analytical runs, the raw data for samples, calibrations, calibration verifications and quality control steps. The raw data for quality control steps shall include results of replicate samples, identity of samples used for replicate samples, matrix spikes, matrix spike concentrations used, reagent blanks, method blanks and quality control limits. Raw data, replicate sample, matrix spike and quality control limit have the meanings specified in s. NR 149.03.

Item 4. Say what steps could be taken that would result in more effective treatment, even for the conventional pollutants, BOD and suspended solids. Provide cost estimates, if you have them and say how you made the estimates.

Item 5. Provide information on industrial contributors of copper to your collection system. Even if you believe an industry does not discharge copper, you should collect samples from various points in the collection system, paying attention to where industrial sources are located. Compare the results of samples from points in the collection system serving strictly domestic areas to those having industrial or commercial contributions to determine if additional efforts are needed to pinpoint non-domestic contributors. Keep in mind that some differences could be seen between new residential developments with predominantly copper piping and older parts of town where galvanized piping may be more prevalent. Compare results from various parts of town, accounting for differences in flow, to total influent levels.

Item 6. Describe the water supply for entities in your wastewater service area.

Indicate what chemical treatment each water supply source receives. If the water supply has been tested for corrosivity, supply details. If not, samples should be taken for testing for pH, hardness and alkalinity and submitted with the application. In addition, results of samples taken to comply with the public water supply lead and copper rule will be used by the Department in evaluating corrosivity. If that sampling has been done, you may simply state that. The Department has the data or you may provide it with your application.

If the water supply is corrosive, indicate if chemical treatment is practiced and give details. Indicate what chemical is used, where it is applied, if it is applied at all wells and how dosage is regulated. If chemical treatment is not practiced at all wells, indicate why not. Indicate if parts of the service area use private wells.

If the water supply appears to be corrosive but chemical treatment is not practiced, provide an estimate of the cost of providing treatment by hiring a consultant or by projecting costs from a similar neighboring community to your situation.

Item 7. Copper will tend to accumulate in the sludge or biosolids. If there are inputs of copper that are above “normal”, results of sludge testing will be a telltale sign. Provide results of sludge testing for copper for the last 3 to 5 years. If your treatment system is a pond or lagoon, supply results of testing that sludge for copper.

Item 8. If you are also requesting a variance for whole effluent toxicity, additional demonstrations may be needed on a case-by-case basis. *Daphnia* would generally be more affected by metals than would the fathead minnows.

Item 9. If there are actions you plan to take that would reduce copper levels, the details you submitted as answers to other items should help you answer these questions. If you have done everything you can and a variance at the level of your current discharge is appropriate, the Department will calculate that number from the representative data you provide.

Item 10. Supply here any other information that you think would be compelling evidence that a variance is appropriate.

Item 11. Your application **must** include a certification of the type shown.

Other Instructions

Additional Information Submittal - After the Department reviews the initial application submittal, you may be asked to supply additional information or to further clarify your answers. You must provide that additional information. This step is helpful for filling in gaps in the information. However, please try to be as complete as you can on the initial application submittal.

Future deadlines - Department responses to your variance application request will alert you to the deadlines for subsequent steps in the process. Be sure to meet all deadlines, keeping in mind that, submission of information means receipt by the Department.

Detailed Application Information - Subchapter III of NR 200, Wisconsin Administrative Code, specifies requirements for variance applications. Actual language from the rule is attached.

Language from Subchapter III, NR 200, Wisconsin Administrative Code. This is the generic language that describes applications for variances. It applies to any substance, not copper in particular.

Subchapter III — Application for Water Quality Standards Variances

NR 200.20 General. (1) *When the department issues, reissues or modifies a permit to include a water quality based effluent limitation under s. 283.13 (5), Stats., the permittee may apply to the department for a variance from the water quality standard used to derive the limitation.*

(2) *In order to obtain a variance, a permittee shall demonstrate, by the greater weight of credible evidence, that attaining the water quality standard is not feasible because of one or more of the following:*

(a) *Naturally occurring pollutant concentrations prevent the attainment of the standard.*

(b) *Natural, ephemeral, intermittent or low flow conditions or water levels prevent the attainment of the standard, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges without violating water conservation requirements.*

(c) *Human caused conditions or sources of pollution prevent the attainment of the standard and cannot be remedied or would cause more environmental damage to correct than to leave in place.*

(d) *Dams, diversions or other types of hydrological modifications preclude the attainment of the standard, and it is not feasible to restore the water body to its original condition or to operate the modification in a way that would result in the attainment of the standard.*

(e) *Physical conditions related to the natural features of the water body, such as the lack of proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses.*

(f) *The standard, as applied to the permittee, will cause substantial and widespread adverse social and economic impacts in the area where the permittee is located.*

NR 200.21 Time deadline for filing variance re-quests.

A permittee who wishes to apply for a variance shall submit an application for a variance within 60 days after the department issues, reissues or modifies the permit.

NR 200.22 Information to be included in an application for a variance. (1) *A permittee applying for a variance shall supply the following information:*

(a) *Facility name, address and WPDES permit number.*

(b) *The name, address and telephone [number] of a facility contact person.*

(c) *The date the permit was issued, reissued or modified which gives rise to the request for a variance.*

(d) *Each water quality standard, pollutant and corresponding effluent limitation for which a variance is being requested.*

(e) *Results of monitoring data for the pollutant for which the permittee is seeking a variance which represents the past and current levels of effluent quality. Monitoring shall conform with the following:*

1. *The submittal shall specify sample location, sample type, sampling dates, analysis dates and laboratory name and certification number.*

2. *Data quantity shall be sufficient to allow appropriate statistical treatment to characterize effluent quality over time.*

3. *Samples shall be collected on days when contributions from industrial, commercial or other processes or sources of wastewater are expected to be at normal levels.*

4. *Results of monitoring shall be summarized in tabular or graphical format or both.*

5. *Any changes, such as changes in contract lab or method of analysis or treatment or process changes that occurred which may have affected results or could explain data trends shall be noted and an explanation provided.*

6. *In addition, for this data to be considered to be representative, the permittee shall supply information to demonstrate that:*

a. *Sample results fall above the limit of quantitation for the analytical method used or that the most sensitive approved analytical method listed for the pollutant in ch. NR 219 was used with proper technique to produce the results.*

b. *Proper laboratory quality control procedures were used to generate the data. To make this demonstration, the permittee shall supply, for several representative analytical runs, the raw data for samples, calibrations, calibration verifications and quality control steps. The raw data for quality control steps shall include results of replicate samples, identity of samples used for*

- replicate samples, matrix spikes, matrix spike concentrations used, reagent blanks, method blanks and quality control limits. Raw data, replicate sample, matrix spike and quality control limit have the meanings specified in s. NR 149.03.*
- c. Proper sampling quality control procedures designed to minimize sample contamination were used. This demonstration shall include a description of sampling procedures and submittal of results of field blanks. A field blank is a volume of reagent grade water which is handled in such a way so as to duplicate as closely as possible the exposure of a water sample to potential sources of contamination during sampling, preservation and transportation to the laboratory.*
- (f) Changes which could be made to enhance treatment or source reduction of flows coming to the treatment facility or which would reduce the level of toxicity or the discharge of the pollutant for which the permittee is seeking a variance. This information shall include the following:*
- 1. An estimate of capital and operating costs for the changes and a reasonable schedule for planning and accomplishing the work.*
 - 2. If the source of the pollutant is believed to be from dissolution of metals from water supply distribution piping materials:*
 - a. Information on past and current water supply treatment practices which may increase or decrease the corrosive nature of the water supply including what changes have been made and when.*
 - b. Data on the water supply stability or corrosivity, using one of various methods of determination, for the raw and treated water supply.*
 - c. Other potential water sources or methods of water supply treatment as an alternative.*
- (g) Information which establishes the significance of industrial and commercial wastewater sources versus domestic wastewater sources of the pollutant for which a variance is requested. This may include an approximate mass-balance calculation of treatment system loadings from all sources.*
- (h) For facilities which monitor the treatment system sludge pursuant to requirements in ch. NR 204 or 214 for the pollutant for which a variance is requested, results of the most recent 3 years of sludge testing, along with volumes disposed of so as to perform an approximate mass balance of the pollutant entering and leaving the plant.*
- (i) If a variance is being requested for whole effluent toxicity in conjunction with a specific chemical pollutant or if whole effluent toxicity failures have been experienced and they are believed to have resulted from the pollutant for which the variance is being requested, evidence which points to the pollutant as the cause of the whole effluent toxicity failures.*
- (j) Effluent limitations which the permittee believes it can currently achieve.*
- (k) Effluent limitations which the permittee believes it can achieve at some later date during the term of the variance and the corresponding schedule which would be followed to meet these limitations.*
- (l) Whether the permittee believes it can meet the effluent limitations that give rise to the variance request at any time during the term of the permit.*
- (m) A detailed discussion of evidence and reasons why the permittee believes a variance is warranted based on one or more of the grounds listed in s. NR 200.20 (2).*
- (n) Demonstration that the variance requested conforms with antidegradation requirements specified in ch. NR 207.*
- (o) Characterization of the extent of any increased risk to human health and the environment associated with granting the variance so as to allow the department to decide if such increased risk is consistent with protection of the public health, safety and welfare.*
- (p) For variance requests based on s. NR 200.20 (2) (f), the permittee shall conduct a financial impact analysis which shall include an estimate of the capital, operation and maintenance and financing costs, translated into an annualized cost, of potential changes identified in par. (g) compared with an analysis of financial affordability. The analysis of financial affordability shall include:*
- 1. For publicly owned systems, an estimate of how much annual municipal revenue would need to increase, taking into account any offsetting state shared revenues if the most cost-effective pollutant control option was implemented and how this would affect user fees if user fees were used to finance the costs. This analysis shall also compare projected user fees with user fees in similar communities. If industrial or commercial contributions comprise a significant source of the pollutant, information requested in subd. 2. shall also be provided.*
 - 2. For privately owned systems or if the most cost-effective pollutant control option for a publicly owned system involves additional regulation of privately owned contributors as the impacted parties, an estimate of how implementing the most cost-effective pollutant control option would affect profitability and other financial health indicators of the private entity.*
 - 3. An analysis of the socioeconomic impacts to the community*

where the entity is located.

Note: Permittees may find helpful a United States Environmental Protection Agency publication titled *Interim Economic Guidance for Water Quality Standards – Workbook*, EPA-823-B-95-002, March 1995. Information on ordering EPA publications can be found on the World Wide Web at <http://www.epa.gov/>.

(2) In addition to the information required in sub. (1), the permittee may, within the 60-day time limits specified in s. NR 200.21, submit to the department any other information to support the request for a variance.

NR 200.23 Signature of authorized representative.

Pursuant to s. NR 205.07(1)(g), a person submitting an application for a variance shall include a signed statement by an authorized representative that certifies to the accuracy of the information.

NR 200.24 Application completeness. When the department receives an application for a variance:

(1) The department may request additional information from the permittee within 30 days after receiving the application. The permittee shall provide the additional information within 30 days of receipt of the department's request. An application is not complete until the additional information is provided to the department.

(2) If the permittee does not provide information as required under s. NR 200.22 or sub. (1), the department shall deny the application.

NR 200.25 Time periods for department action on applications. The department shall adhere to the time deadlines specified in s. 283.15, Stats., in making determinations of application completeness and tentative and final decisions on variance requests.

Note: These time deadlines are as follows: (1) Public notice of receipt of an application for a variance within 30 days after receipt of the information specified in s. NR 200.22 or 200.24 (1), if applicable. (2) Public notice of a tentative decision within 120 days after receipt of the information specified in s. NR 200.22 or 200.24 (1), if applicable. (3) Final decision within 90 days after expiration of the 30-day public notice comment period under sub. (2).