

Alternative Phosphorus Effluent Limitation Request Checklist (May 28, 2002)

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.

At the time of permit application, permittees applying for an alternative phosphorus limitation should submit this completed checklist together with a cover letter requesting the alternative limit. Please review the Department's NR 217 Implementation Guidance for assistance in completing this checklist. It can be found at www.dnr.state.wi.us/org/water/wm/wqs/guidance.htm. If you do not have Internet access contact your local DNR representative.

If your current permit already contains an alternative limit, you may at this time provide an update of the information needed to justify an alternative limitation. In that case, indicate what changes have occurred that would necessitate a reevaluation, what information you have gained during the last permit term and how that would affect conclusions reached for your previous alternative limit request.

If you wish to apply for an alternative phosphorus limitation you can do so by using one of the following four criteria. Please check the box to indicate the criteria you are applying under.

- I - Where attainment is not practically achievable considering energy, economics and environmental impacts. (Complete Section I below)
- II - Where biological phosphorus removal will result in removal of phosphorus on a mass basis which is comparable to that which would be removed by achieving the 1.0 mg/L effluent standard. (Complete Section II below)
- III. - Where phosphorus deficient wastewaters require the addition of phosphorus to maintain normal treatment system operation to meet other effluent limitations. (Complete Section III below)
- IV. - Where achieving the 1.0 mg/L effluent standard will not result in an environmentally significant improvement in water quality. (See note in Section IV below)

The information described in the checklist must be provided before the Department can make a determination of eligibility and calculate an alternative phosphorus limit. This checklist is provided to help you make sure you have submitted the needed information.

Perform the activities in the order given as you may find that you aren't eligible for an alternative phosphorus limit and completion of the checklist would no longer be necessary.

I Where attainment is not practically achievable considering energy, economics and environmental impacts.

MUNICIPAL

- Complete a cost-effective analysis for providing treatment to meet a 1.0-mg/L phosphorus limit. See guidance for sample analysis. If your annual residential cost does not increase at least 25% you are probably not eligible for an alternative phosphorus limit. (see guidance)
- If you find your annual residential cost will increase by at least 25% you must submit a completed cost-effective analysis, a copy of the past years wastewater budget and a report giving your current residential cost, number and type of connections and expected user charge to meet the 1.0 mg/L phosphorus limit.
- Existing lagoon systems must evaluate the addition of chemical precipitant to lagoon cells to meet the 1.0 mg/L limit. If the limit can be met no alternative limit is given but if the 1.0-mg/L limit cannot be met an alternative limit could be given based on the performance of the chemical addition system.
- Submit a phosphorus minimization plan. The plan must include:
 - Data: Accurate flow monitoring, influent and effluent phosphorus data and treatment capabilities;
 - Sources: Phosphorus loading from each source, processes that contribute phosphorus, actions available to reduce phosphorus and expected phosphorus reduction;
 - Recommendations: Actions that will be taken and a schedule to implement recommendations.
- Submit at least 11 effluent phosphorus results. The Department needs at least 11 effluent sample results to calculate an alternative phosphorus limit. The results should be collected after any phosphorus minimization implementation and lagoon chemical addition if applicable.

INDUSTRIAL

- You must demonstrate that the cost/pound of phosphorus removed is significantly more (e.g., twice as much) for the increment of phosphorus removed between that what is considered practically achievable and 1.0 mg/L versus that to achieve practical treatment. If you can not make this demonstration you are probably not eligible for an alternative phosphorus limit. (see guidance)
- If you find your cost/pound of phosphorus removed is significantly more for the increment of phosphorus removed between that what is considered practically achievable and 1.0 mg/L you must submit documentation to this effect. For chemical removal systems this should include a graph comparing effluent concentration to cost/pound removed.
- Existing lagoon systems must evaluate the addition of chemical precipitant to lagoon cells to meet the 1.0 mg/L limit. If the limit can be met no alternative limit is given but if the 1.0-mg/L limit cannot be met an alternative limit could be given based on the performance of the chemical addition system.
- Submit a phosphorus minimization plan. The plan must include:
 - Data: Accurate flow monitoring, influent and effluent phosphorus data and treatment capabilities.
 - Sources: Phosphorus loading from each source, processes that contribute phosphorus, actions available to reduce phosphorus and expected phosphorus reduction. Special attention should be paid to chemical substitutions.
 - Recommendations: Actions that will be taken and a schedule to implement recommendations.
- Specify the discharge concentration that is believed to be “practically achievable”.
- Submit at least 11 effluent phosphorus results. The Department needs at least 11 effluent sample results to calculate an alternative phosphorus limit. The results should be collected after any phosphorus minimization implementation and lagoon chemical addition if applicable.

II Where biological phosphorus removal will result in removal of phosphorus on a mass basis which is comparable to that which would be removed by achieving the 1.0 mg/L effluent standard.

- Determine if biological removal will result in at least 90% removal of phosphorus that would be removed to meet then 1.0 mg/L limit based upon a mass basis. If this criterion can not be met you are not eligible for an alternative limit.
- Determine the BOD or COD to total phosphorus ratio of the influent. A BOD:TP ratio greater than 10 is suggested for municipal facilities. A COD:TP ratio greater than 35 is suggested for industrial (in particular dairy) facilities. If these ratios are not met phosphorus removal may not be sufficient to meet the criterion and phosphorus minimization may be necessary. In situations where the appropriate ratio is met, it is suggested that minimization be evaluated. When evaluating substitution for phosphorus based chemicals, consider the potential adverse impacts that nitrates (such as from nitric acid) may have on biological removal. Please provide to the Department information on actions taken in the area of phosphorus minimization.
- Submit the following data: average influent and effluent total phosphorus concentration and mass, as well as the monthly average influent and effluent total BOD (or COD), total Nitrogen, pH, effluent ammonia and nitrate/nitrite nitrogen concentration. A minimum of 12 influent and effluent data points that are representative of current conditions for each substance is suggested, preferably over a one-year period.
- Submit data on the proposed/planned phosphorus removal efficiency, phosphorus mass removed and effluent phosphorus concentration for each of the three phosphorus removal options.
 - Biological removal without chemical polishing;
 - Biological removal with chemical polishing;
 - Treatment technology to achieve 1.0 mg/L limit.

III Where phosphorus deficient wastewaters require the addition of phosphorus to maintain normal treatment system operation to meet other effluent limitations.

- Submit the results of a comprehensive study to minimize the amount of phosphorous discharged while allowing efficient operation of the treatment system.
- Submit an evaluation of possible methods to reduce phosphorous discharges and the capital and operating costs associated with utilizing alternative phosphorus minimization strategies.
- Submit an evaluation of the optimization of the phosphorus and other nutrient addition points, metering system, control system and mixing, which includes residual testing at various locations in the treatment system.
- Provide documentation of the process control procedures used to operate the treatment facility and evaluation of the removal efficiencies of phosphorus and other limited parameters at various operating conditions. The process should be controlled to optimize the performance of the treatment system prior to evaluating impacts of various phosphorus addition rates on plant performance.
- Submit an evaluation of the BOD and TSS removal which will be realized at various phosphorus residual concentrations and a recommendation of the minimum phosphorus concentration which will provide proper treatment. It is suggested that, where possible pilot studies be conducted with various phosphorus concentrations prior to making modifications to the treatment plant to reduce the potential for plant upsets.
- Provide a characterization of the phosphorus, BOD and TSS content of the wastewater treatment plant influent and effluent prior to and after minimization efforts.
- Provide the removal efficiencies and costs associated with treatment technologies, which would be necessary to achieve 1 mg/l. The costs shall be compared to overall treatment costs. Additionally, the cost per pound of the total phosphorous removed (on an annual basis or TPW) to reduce the phosphorous from that achievable through minimization to 1 mg/l should be presented.

IV Where achieving the 1.0 mg/L effluent standard will not result in an environmentally significant improvement in water quality.

The type of demonstration required under this option does not lend itself to description in this shortened format. If you apply under this alternative, please consult the Implementation Guidance. In addition, although not discussed in the Guidance, in some situations, land use modeling is being looked at as a possible way to make this type of demonstration.