

PHOSPHORUS

Pollutant: Phosphorus occurs in many forms and analytical results (e.g., total, ortho, dissolved, refractory, organic, etc.). It is important to recognize and understand the ecological differences among the various forms.

Water Quality Impact: Phosphorus is a plant nutrient necessary for algal growth. Excessive algal growth can cause eutrophication, which can result in violations of dissolved oxygen, pH, and aesthetic water quality standards. Eutrophication in rivers takes higher concentrations and more time than lakes and reservoirs, and is influenced by other conditions such as depth, velocity, shade, sediment concentration and temperature.

Toxic? No.

Numeric Standard: No. Refer to current IDAPA.

Narrative Standard: No. Indirectly linked to excess nutrients. Refer to current IDAPA.

Permitting Considerations: When necessary, discharge permit limits should reflect the pollutant characteristics and water quality impacts. For phosphorus, appropriate discharge permit limits should apply averaging periods specific to the receiving water body. It is not appropriate to apply acute or chronic toxicity limit timeframes for phosphorus, such as those addressed by the TSD (EPA 1991). Developing effluent limits for phosphorus using the TSD guidance may result in unnecessary and impracticable effluent limits, treatment costs, and permit compliance risk. The water quality objective for phosphorus is to prevent eutrophication in lakes, reservoirs, and rivers and should be evaluated using large mixing zones or full dilution if applicable (e.g., no TMDL but localized single discharger effect).

Determination of Need

1. For re-issued permits, are there requirements for a water quality based limit in the existing permit?
 - a. Review current standards, treatment, receiving water and beneficial use conditions. Is removal of the effluent limit possible and consistent with anti-backsliding?
 - b. Otherwise assess need for stricter requirements (e.g. a new TMDL); if stricter requirements are not necessary, maintain existing permit requirements.
2. Determine if there is a basis for the permit to include water quality based pollutant requirements or effluent limitations.
 - a. Assess reasonable potential to exceed to determine whether an effluent limit is required (e.g., discharge-specific effects on the water body).
 - b. Check if a TMDL has been finalized for the receiving or downstream water body since the issuance of the existing permit. Identify wasteload allocation (WLA) and methodology for determination in the TMDL.
 - c. Check if a TMDL is pending for the receiving or downstream water body. Discuss with DEQ management if these affect permit writing (e.g., need for specific performance based requirements).

Formulation of Requirement

1. Effluent limitations for phosphorus should be seasonal loads; or annual if appropriate. (See guidance document for discussion and examples of impracticable WQBELs.) Shorter periods should be used only when required by a TMDL, a scientific basis, or a specific policy decision.
2. Check if pollutant requirements or effluent limitations are for a single facility or part of a watershed permit or a combined (bubble) load for multiple facilities. (See guidance document for discussion of watershed/bubble permits.)
3. Using facility information, and in consultation with the facility owner, assess whether an interim limit and/or a compliance schedule is necessary.

Example of Seasonal NPDES Effluent Limitations Permit Structure

| Parameter | Seasonal Limit | Average Monthly Limit | Average Weekly Limit | Maximum Daily Limit |
|--|----------------|-----------------------|----------------------|---------------------|
| Total Phosphorus (March 1 – October 31) | 2.80 lbs/day | --- | --- | --- |

JOINT SINGLE SOURCE PERMITTING (AKA WATERSHED, COMBINED LOAD OR BUBBLE)

Pollutant: Any non-toxic.

Water Quality Impact: No net effect. Single sources are combined for evaluating impact and setting effluent limitations.

Toxic? No.

Numeric Standard: No.

Narrative Standard: No.

Permitting Considerations: Do two or more sources in the same area, discharging the same pollutants to the same water body want effluent limitations to be determined as shared or combined load? Watershed-based NPDES permitting is a process that addresses a variety of related water quality stressors within a hydrologically-defined drainage basin, rather than individually addressing pollutant sources. Watershed-based permitting can encompass a variety of activities such as synchronizing permits within a basin; utilizing water quality-based effluent limits from multiple discharger modeling and analysis (e.g., Total Maximum Daily Loads, TMDLs); or apportioning a total (combined or “bubble”) load among multiple facilities to foster intra-municipal trades or offsets.

Determination of Need

1. Determine if there is a basis for the permit to include water quality based pollutant requirements or effluent limitations for non-toxic pollutants that could be combined.
2. Permittee(s) may request and/or DEQ management may select. Suitable applications for watershed permitting may exist in a number of Idaho watersheds and provide advantages over the preparation and renewal of individual permits. In particular, permits driven by watershed management efforts and TMDLs for nutrients and temperature that transcend individual mixing zones and reflect broader water quality objectives may be especially appropriate. Opportunities for collaboration and optimization of management efforts can be supported with watershed permitting for individual entities interested in shared responsibility for watershed-based bubble limits.

Formulation of Requirement

1. Watershed based effluent limitations may be for any non-toxic pollutant for which WQBELs are necessary. Follow the guidance on the specific pollutant for determining effluent limitations.
2. Determine if individual effluent limitations for each facility are additive. Use water quality analysis or modeling, if available from TMDL or other studies.
3. Assess combined permit effluent limitations to water quality standards and compliance monitoring locations.
4. Using facility information, and in consultation with the facility owner, assess whether an interim limit and/or a compliance schedule is necessary.

Example

Various case studies are available including: Tualatin River, Oregon, San Francisco Bay, California, Long Island Sound, New York and Connecticut, Jamaica Bay, New York, Chesapeake Bay, Virginia, and Las Vegas Wash, Nevada.

Example of Seasonal NPDES Effluent Limitations Permit Structure

| Parameter | Seasonal Limit | Average Monthly Limit | Average Weekly Limit | Maximum Daily Limit |
|--|---|-----------------------|----------------------|---------------------|
| Total Phosphorus (March 1 – October 31) | Plant A Outfall 001 A_1 lbs/day Plant B Outfall 001 B_1 lbs/day $A_1 + B_1 \leq 4.30$ lbs/day | --- | --- | --- |
| A_1 = Plant A seasonal median discharge concentration of total P mg/L x Plant A seasonal median effluent volume MGD x 8.34 conversion factor B_1 = Plant B seasonal median discharge concentration of total P mg/L x Plant B seasonal median effluent volume MGD x 8.34 conversion factor | | | | |

TEMPERATURE

Pollutant: Temperature.

Water Quality Impact: High temperatures/thermal loads may negatively affect plants, ecosystem composition, and fish.

Toxic? No.

Numeric Standard: Yes. Refer to current IDAPA.

Narrative Standard: Yes. Refer to current IDAPA.

Permitting Considerations: Temperature is not a toxic pollutant under the Clean Water Act (CWA) and thus the need for effluent limits should be evaluated differently. For many facilities there are no cost-effective treatment options for temperature, and expensive and not environmentally responsible (very high energy use and associated greenhouse gas emissions). Many NPDES permits have not historically regulated temperature as a problem pollutant, thus the permit manager should use the next permit cycle to collect enough temperature data during the critical season to make this determination. Collect enough data to characterize effluent and background receiving water temperatures, and the available dilution during critical conditions. Also be aware that Section 316(a) of the CWA, and associated DEQ rules and guidance, provide alternative permitting approaches specifically related to temperature.

Determination of Need

1. For re-issued permits, are there requirements for a water quality based limit in the existing permit?
 - a. Review current standards, treatment, receiving water and beneficial use conditions. Is removal of the effluent limit possible and consistent with anti-backsliding?
 - b. Otherwise assess need for stricter requirements (e.g. a new TMDL); if stricter requirements are not necessary, maintain existing permit requirements.
2. Determine if there is a basis for the permit to include WQBELs pollutant requirements or effluent limitations.
 - a. Check if a TMDL has been finalized for the receiving or downstream water body since the issuance of the existing permit. Identify wasteload allocation (WLA) and methodology for determination in the TMDL.
 - b. Check if a TMDL is pending for the receiving or downstream water body. Discuss with DEQ management if these affect permit writing (e.g., need for specific performance based requirements).
 - c. Check if water temperatures are impacting beneficial uses. If so, when does this occur, infrequently, specific hours, specific seasons, etc. If Section 316(a) demonstration has been or will be prepared by the permittee, and is determined by DEQ to be a possible approach, can alternative thermal effluent limits (ATELs) be established to protect the Balanced Indigenous Community (BIC)?

Formulation of Requirement

1. If effluent limitations are reliably achievable, follow IDPES guidance for calculating limits.
2. If effluent limitations are not reliably achievable, use regulatory approaches in the permit and meet with permittee.
 - a. Can an extended mixing zone be used?
 - b. Can Section 316(a) be used or has it been requested by the permittee?
 - c. Can performance-based limits, which may include alternate O&M methods or BMPs, be established?
 - d. Can the effluent not be discharged to the receiving water during critical periods?
 - e. Can a watershed or combined load (bubble) permitting approach be used?

Example

316(a) Demonstration Approach: ATELs established based on historical performance of the facility (maximum expected effluent temperatures per month or season) and justified by site-specific evaluations of how these ATELs are protective of the BIC in the river. For an existing discharge, this can be done with an upstream-downstream comparison of biological information showing no appreciable harm, for the future design case by thermal modeling and biothermal attributes and requirements of the BIC.

TOXICS

Pollutant: A broad group of chemicals with negative effects on humans and/or aquatic organisms. Individual toxics may be described further.

Water Quality Impact: Surface waters of the state must be free from toxic substances in concentrations that impair designated beneficial uses. A toxic substance is a substance that can cause disease, malignancy, genetic mutation, death, or similar consequences such as reduced growth and reproduction for aquatic organisms. Impacts can be acute and/or chronic.

Toxic? Yes.

Numeric Standard: Yes, for numerous criteria. Refer to current IDAPA.

Narrative Standard: Yes. Refer to current IDAPA.

Permitting Considerations: Setting effluent limitations for toxics, particularly at extremely low and unattainable levels, are frequently inappropriate and should be avoided. Instead, the permit writer is to use other conditions and approaches (e.g. variances; pollution minimization plans; integrated plans; toxics reduction strategies). In addition, some toxics, such as PCBs and phthalates, have extremely low criteria that can only be measured using sampling and analytical procedures that can be highly influenced by incidental sample contamination.

Determination of Need

1. For re-issued permits, are there requirements for a water quality based limit in the existing permit?
 - a. Review current standards, treatment, receiving water and beneficial use conditions. Is removal of the effluent limit possible and consistent with anti-backsliding?
 - b. Otherwise assess need for stricter requirements (e.g. a new TMDL); if stricter requirements are not necessary, maintain existing permit requirements.
2. Determine if there is a basis for the permit to include water quality based pollutant requirements or effluent limitations.
 - a. Assess reasonable potential to exceed to determine whether an effluent limit is required (e.g., discharge-specific effects on the water body).
 - i. If data are limited, questionable quality, and/or poorly characterized receiving water and/or effluent, the permit writer should include in the permit an enhanced monitoring effort and no effluent limitations.
 - b. Check if a TMDL has been finalized for the receiving or downstream water body since the issuance of the existing permit. Identify wasteload allocation (WLA) and methodology for determination in the TMDL.
 - c. Check if a TMDL is pending for the receiving or downstream water body. Discuss with DEQ management if these affect permit writing (e.g., need for specific performance based requirements).
3. Determine if water quality based pollutant requirements or effluent limitations could currently be met at the facility or with foreseeable upgrades.

Formulation of Requirement

1. If effluent limitations are reliably achievable, follow typical IDPES ELDG guidance for calculating limits (e.g., TSD-based).
2. If effluent limitations are not reliably achievable, use other regulatory approaches in the permit.
3. If the toxic has very low level criteria, and sampling and analysis is commonly subject to incidental contamination, require monitoring with a QAPP tailored to how to address blank contamination. Reevaluate the need for effluent limitations in the subsequent permit cycle.
4. The permit writer may use a minimization and/or source identification program.

- a. If data exist and/or can be collected about the pollutant and its potential impact on the receiving water, then permit writer should require more in-depth studies of the pollutant such as a Biotic Ligand Model (BLM study), fisheries study, evaluation of hardness, management plans, and/or other studies.
- b. If data exist and/or can be collected showing source control is important, then pollution minimizations plans, purchasing policies, and/or source specific pretreatment requirements should be required.
- c. If the pollutant is has complex, multiple forms (such as PCBs), then the permit writer should require studies of the subcomponents of the pollutant and the majority of the Human Health risk.

Example

The permittee must submit a Toxics Management Plan (TMP). The goal of the TMP must be to reduce loadings of toxic to the receiving water to the maximum extent practicable. The TMP must address source control and elimination of toxic as follows:

- a. From contaminated soils, sediments, storm water and groundwater entering the POTW collection system via inflow and infiltration.
- b. From industrial and commercial sources.
- c. The permittee must not allow any person to discharge to the POTW water containing toxic in excess of any applicable pretreatment local limit established by the POTW.
- d. By means of eliminating existing sources that are within the direct control of the permittee.
- e. By means of changing the permittee's procurement practices, control and minimize the future generation and release of toxic that is within the direct control of the permittee, including preferential use of toxic free substitutes for those products containing toxics below the regulated level.
- f. The permittee, either individually or in collaboration with other dischargers to the receiving water, must develop and implement a public education program to educate the public about toxic.
- g. The education program must include distribution of appropriate educational materials to the target audiences at least once per year.
- h. At least once per year, the permittee must prepare and distribute appropriate information relevant to the TMP to a newspaper(s) of general circulation within the jurisdiction(s) served by the POTW that provide(s) meaningful public notice.
- i. The permittee must make all relevant TMP documents available to the public.

The permittee must submit an annual report. Each annual report must contain the following information:

- a. Monitoring results for toxic for the previous 12-month period, including laboratory data sheets.
- a. Copies of education materials, ordinances (or other regulatory mechanisms), inventories, guidance materials, or other products produced as part of the TMP.
- b. A description and schedule for implementation of additional actions that may be necessary, based on monitoring results, to ensure compliance with applicable water quality standards.
- c. A summary of the actions the permittee plans to undertake to reduce discharges of toxic during the next reporting cycle.
- d. A summary of the actions taken to reduce discharges of toxic during the previous 12-month period.