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U.S. EPA NPDES Permit Writers' Manual



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Tiered permits with alternate limits should be used only after careful consideration of production data and only when a substantial increase or decrease in production is likely to occur. In the example above, the lower limits would be in effect when production was at "low" levels. During periods of significantly higher production, the higher limits would be in effect. In addition, alternate limits may also be appropriate in the case of special processes or product lines. The thresholds, measures of production, and special reporting requirements must be detailed in the permit. Special reporting requirements include provisions such as:

- The permittee notifying the permitting authority at least two business days prior to the month they expect to be operating at a higher level of production and the duration this level of production is expected to continue
- The permittee reporting, in the discharge monitoring report, the level of production and the limitation and standards applicable to that level.

Mass Versus Concentration Limits

The regulations at 40 CFR §122.45(f)(1) require that all permit limits, standards, or prohibitions be expressed in terms of mass units (e.g., pounds, kilograms, grams) except under the following conditions:

- 1) For pH, temperature, radiation, or other pollutants that cannot appropriately be addressed by mass limits;
- 2) When applicable standards and limitations are expressed in terms of other units of measurement; or
- 3) If in establishing technology-based permit limitations on a case-by-case basis limitations based on mass are infeasible because the mass or pollutant cannot be related to a measure of production. The limitations, however, must ensure that dilution will not be used as a substitute for treatment.

While the regulations require that limitations be expressed in terms of mass, a provision is included at 40 CFR §122.45(f)(2) that allows that permit writer, at his or her discretion, to express limits in additional units (e.g., concentration units). Where limits are expressed in more than one unit, the permittee must comply with both.

As provided by the regulations, the permit writer may determine that expressing limits in more than one unit is appropriate under certain circumstances. For example,

expressing limitations in terms of concentration as well as mass encourages the proper operation of a treatment facility at all times. In the absence of concentration limits, a permittee would be able to increase its effluent concentration (i.e., reduce its level of treatment) during low flow periods and still meet its mass-based effluent limits. Concentration limits discourage the reduction in treatment efficiency during low flow periods, and require proper operation of treatment units at all times.

The derivation of concentration limits should be based on evaluating historical monitoring data and using engineering judgment to be sure they are reasonable. In certain situations, the use of concentration limits may not be appropriate since they may discourage the use of innovative techniques, such as water conservation by the permittee. For example, if a facility had a history of providing efficient treatment of its wastewater and also wished to practice water conservation, inclusion of concentration limits would not be appropriate (i.e., concentration limits would prohibit decreases in flow that would concurrently result in an increase in pollutant concentration). To summarize, the applicability of concentration limits should be a case-by-case determination based upon the professional judgment of the permit writer.

It should be noted that the long-term average flow should be used to calculate both the monthly average and daily maximum concentrations. The use of the long-term average flow is most appropriate for the calculation of concentration limits because it will reflect the range of concentrations that could be expected in a well operated plant. The use of the maximum daily flow is not appropriate to determine concentration limits from the mass limitations because it will reduce the concentration below the value which could be expected in a well operated plant. Alternatively, use of the lowest flow value will increase the concentration limit to levels above what would be expected in a well operated plant.

Example 1:

An industrial facility (leather tanner) is subject to effluent limitations guidelines based on its rate of production. The permit writer calculates the applicable mass-based limits based on the long-term production rate at the facility and incorporates the mass limits in accordance with 40 CFR §122.45(f)(1).

In reviewing the past inspection records for the facility, the permit writer notes that while the facility is generally in compliance with its mass limits, the effluent flow and concentration vary widely. To ensure that the treatment unit is operated properly at all times, the permit writer determines that concentration-based limits are also appropriate. The permit writer consults the EPA Development Document for the leather tanning effluent limitations guidelines and bases the concentration-based limits on the demonstrated performance of the treatment technology upon which the effluent guidelines were based. The concentration-based limits are then incorporated in the permit in accordance with 40 CFR §122.45(f)(2).

Example 2:

For Company A, the mass limits for pollutant X have been set at 260 lbs/day and 390 lbs/day monthly average and daily maximum, respectively. What are the monthly average concentration limitations in milligrams per liter (mg/l) using both an average flow of 0.9 mgd and the low flow of 0.6 mgd? Note: 8.34 is a conversion factor with the units (lbs/day)/(mgd)(mg/l).

Discussion:

Monthly average limit (based on average flow):
 $260 \text{ lbs/day} / (8.34 \times 0.9 \text{ mgd}) = \underline{35 \text{ mg/l}}$

Monthly average limit (based on low flow):
 $260 \text{ lbs/day} / (8.34 \times 0.6 \text{ mgd}) = \underline{52 \text{ mg/l}}$

This is almost 150 percent more than the concentration during average flow!

In determining applicable effluent concentration limitations, the monthly average and daily maximum mass limits divided by the average flow will provide appropriate concentrations.

Monthly average limit:
 $260 \text{ lbs/day} / (8.34 \times 0.9 \text{ mgd}) = \underline{35 \text{ mg/l}}$

Daily maximum limit:
 $390 \text{ lbs/day} / (8.34 \times 0.9 \text{ mgd}) = \underline{52 \text{ mg/l}}$

5.1.4 Best Professional Judgment Permit Limits

Best Professional Judgment (BPJ)-based limits are technology-based limits derived on a case-by-case basis for non-municipal (industrial) facilities. BPJ limits are established in cases where ELGs are not available for, or do not regulate, a particular pollutant of concern. BPJ is defined as the highest quality technical opinion developed by a permit writer after consideration of all reasonably available and pertinent data or information that forms the basis for the terms and conditions of a NPDES permit.

The authority for BPJ is contained in Section 402(a)(1) of the CWA, which authorizes the EPA Administrator to issue a permit containing "such conditions as the Administrator determines are necessary to carry out the provisions of this Act" prior to taking the necessary implementing actions, such as the establishment of ELGs. During the first round of NPDES permits in the early-to-mid-1970s, a majority of permits were based on the authority of Section 402(a)(1) of the CWA. These first round so-called best engineering judgment permits were drafted because effluent guidelines were not available for many industries. As effluent guidelines began to be promulgated, permit writers had to rely less on their best engineering judgment and could apply the ELGs in permits. As the implementation of the age of toxic pollutant