

RESPONSE TO COMMENTS

Permittee: City of Weippe

Permit No.: ID-002035-4

Background: On August 16, 2001, EPA proposed to reissue the NPDES permit for the city of Weippe, Idaho. The public notice of the proposal initiated a 30-day comment period which expired on September 17, 2001. The only comments received on the draft permit were from the city of Weippe and the Idaho Department of Environmental Quality (IDEQ). This document summarizes the comments and EPA's response to those comments.

Comment: The city requested that the limits and monitoring requirements for phosphorus be removed from the permit. The conclusions of the errata sheet of the TMDL for Jim Ford Creek did not include a waste load allocation for the city for phosphorus. Based on the evidence gathered and analyzed for the TMDL, there is nothing to indicate that the city's effluent will cause a water quality exceedance for phosphorus in the creek.

Response: A TMDL for total phosphorus was required for Jim Ford Creek in the area of Weippe's discharge because the stream's load capacity (368 pounds per month) was exceeded (506 pounds per month existing load). TMDLs must account for all sources of pollutant loading, and must include waste load allocations for all point sources which discharge the pollutant, even if no reduction in pollutant loading is required. Specifically, the last paragraph on page 3-25 of the TMDL says, "...the Weippe WWTP discharge permit will be written at their existing nutrient load. Presently, the WWTP is discharging about 30 pounds of TP during the averaging period." No load reduction is required. The monitoring requirement has been reduced to once per month when the facility is discharging.

Comment: Both the city and IDEQ requested that the limits and monitoring requirements for fecal coliform be removed from the permit for the following reasons. The state has recently established a new water quality requirement to protect public health based on e-coli rather than fecal coliform. Since both standards are protective of human health with regard to primary and secondary contact, either standard is appropriate and the use of both standards is redundant. Since e-coli is more sensitive to environmental effects than the fecal coliform group, sampling for e-coli would be more informative to the city, the state, and EPA regarding public health protection.

The use of fecal coliform sampling to determine disinfection effectiveness is redundant if sampling for e-coli is also required. Since e-coli is a subgroup of the fecal coliform group, and is more sensitive to environmental factors, sampling for e-coli would allow the city to better determine disinfection effectiveness than the previously used fecal coliform.

The sampling requirement would add from \$10,000 to \$15,000 to the annual sampling bill

for the city. Such a sampling requirement would tax the existing facility and jeopardize the ability of the city to ensure that public health is protected through proper sampling requirements as they exist today. The city would have to divert needed operation, maintenance and improvement funds to pay for sampling that has no impact on the protection of public health and the environment.

IDAPA 58.01.02.401.05 states that exceptions to treatment requirements can be granted on a case-by-case basis when it can be demonstrated that:

- i. Such exceptions will not seriously affect existing water quality and uses are adequately protected, and
- ii. The treatment requirement is economically prohibitive.

The massive increase to the requirement for fecal coliform testing is economically prohibitive to the city and will have no effect on existing water quality and uses.

Response: The state's water quality standards have been revised to delete the reference to fecal coliform in section 58.01.02.420.05. Therefore fecal coliform limits and monitoring requirements have been removed from the permit.

Comment: The city requested that the monitoring frequency for e.coli be reduced to twice per month. The final 401 certification from IDEQ determined that an exemption is warranted and a sampling frequency for E. coli of once per week will be sufficient to reasonably demonstrate compliance with the state's water quality standards. The exemption will not seriously affect existing water quality and will adequately protect the designated beneficial use of primary contact recreation.

Response: The final permit reflects an E.coli monitoring frequency of once per week.

Comment: The city requested that the residual chlorine limit be increased to 0.5 mg/L (the same as the existing permit limit) for the following reasons. The lagoon system cannot meet the monthly average limit of 74 µg/L and still meet the e.coli bacteria requirements. The city would have to construct extensive chlorine contact facilities and dechlorination facilities at the point in their plant where there is little or no room for such facilities. The cost for such improvements would be prohibitive to the city.

The final 401 certification from IDEQ included a detailed mixing zone analysis for Weippe. The mixing zone is defined as 1/4 of the stream width for a maximum distance of 50 feet or until complete mix occurs within 50 feet of the outfall. The instream concentrations below the complete mixing zone must meet water quality standards for acute and chronic chlorine concentrations. The IDEQ certified that water quality standards would be met at a dilution of 50:1.

Response: EPA recalculated the residual chlorine limits based on a design flow of 0.536 mgd

from the facility at the dilution rate of 50:1. The same process that was used in Appendix D of the Fact Sheet developed for the Weippe permit was used. Further discussions with the city have clarified that they can comply with a monthly average limit of 0.3 mg/L. At a dilution of 50:1, a monthly average limit of 0.3 mg/L complies with the state's water quality standards and will allow the city more flexibility in the discharge period than would be available at a higher dilution ratio. The calculations are as follows:

Step 1 - Determine the WLA

The acute and chronic aquatic life criteria are converted to acute and chronic waste load allocations (WLA_{acute} or $WLA_{chronic}$) for the receiving waters based on the following mass balance equation:

$$(Q_e + Q_u) C_d = Q_e C_e + Q_u C_u$$

where,

- C_d = aquatic life criteria that cannot be exceeded downstream
 C_d (acute) = 19.0 $\mu\text{g/l}$; C_d (chronic) = 11.0 $\mu\text{g/l}$
- Q_e = effluent flow = Design flow of 0.536 mgd
- C_e = allowable concentration of pollutant in effluent = WLA_{acute} or $WLA_{chronic}$
- Q_u = upstream low flow = 26.8 mgd at a 50:1 dilution
- C_u = upstream background concentration of pollutant = 0 $\mu\text{g/l}$

Rearranging the above equation to determine the effluent concentration (C_e) or the wasteload allocation (WLA) results in the following:

$$C_e = WLA = \frac{(Q_u + Q_e) C_d - Q_u C_u}{Q_e}$$

Therefore,

$$WLA_{acute} = \frac{(19.0 \times 26.8) + (19.0 \times 0.536)}{0.536} = 969 \mu\text{g/l}$$

$$WLA_{chronic} = \frac{(11.0 \times 26.8) + (11.0 \times 0.536)}{0.536} = 561 \mu\text{g/l}$$

Step 2 - Determine the Long Term Average (LTA)

The acute and chronic WLAs are then converted to Long Term Average concentrations (LTA_{acute} and $LTA_{chronic}$) using the following equations:

$$LTA_{acute} = WLA_{acute} \times e^{[0.5F^2 - zF]}$$

where,

$$F^2 = \ln(CV^2 + 1)$$

z = 2.326 for 99th percentile probability basis

CV = coefficient of variation = standard deviation/mean = 0.8

$$LTA_{chronic} = WLA_{chronic} \times e^{[0.5F^2 - zF]}$$

where,

$$F^2 = \ln[(CV^2/n) + 1]$$

z = 2.326 for 99th percentile probability basis

CV = coefficient of variation = 0.8

n = number of samples (20 per month)

Calculate the LTA_{acute} and the $LTA_{chronic}$:

$$LTA_{acute} = 969 \times 0.249 = 242 \text{ } \mu\text{g/L}$$

$$LTA_{chronic} = 561 \times 0.672 = 377 \text{ } \mu\text{g/L}$$

Step 3

To protect a waterbody from both acute and chronic effects, the more limiting of the calculated LTA_{acute} and $LTA_{chronic}$ is used to derive the effluent limitations. In this case, the LTA_{acute} is the more limiting condition and will be used to calculate the effluent limitations for chlorine. The TSD recommends using the 95th percentile for the Average Monthly Limit (AML) and the 99th percentile for the Maximum Daily Limit (MDL).

Step 4

1. The MDL and the AML would be calculated as follows:

$$MDL = LTA_{acute} \times e^{[zF - 0.5F^2]}$$

where,

$$F^2 = \ln(CV^2 + 1)$$

z = 2.326 for 99th percentile probability basis

CV = coefficient of variation

$$LTA_{acute} = 242 \text{ } \mu\text{g/L}$$

$$e^{[zF - 0.5F^2]} = 0.401033725$$

$$MDL = 970 \text{ } \mu\text{g/L} = 0.97 \text{ mg/l}$$

Federal regulations require limits to be expressed as mass. The mass based limit is:

$$(970 \div 1000) \times 8.34 \times 0.536 = 4.34 \text{ lbs/day}$$

$$AML = LTA_{acute} \times e^{[zF - 0.5F^2]}$$

where,

$$F^2 = \ln[(CV^2/n) + 1]$$

$$z = 1.645 \text{ for } 95^{\text{th}} \text{ percentile probability basis}$$

$$CV = \text{coefficient of variation}$$

$$n = \text{number of samples (20 per month)}$$

$$LTA_{acute} = 242 \mu\text{g/L}$$

$$e^{[zF - 0.5F^2]} = 1.3178$$

$$AML = 320 \mu\text{g/L} = 0.32 \text{ mg/l}$$

The mass based limit is:

$$(320 \div 1000) \times 8.34 \times 0.536 = 1.43 \text{ lbs/day}$$

Comment: The city requested relief from the BOD percent removal requirement during periods of high inflow and infiltration (I/I); the IDEQ opposed the 65% removal requirement for TSS for the following reasons:

Most wastewater collection and treatment facilities in Idaho have problems controlling I/I. This can cause the TSS concentration in the influent to be very low and make achieving a 65% reduction for the system impossible. If the EPA is going to require a 65% reduction in TSS, this number should be based on the pounds of TSS entering and leaving the treatment facility, not on concentration.

Waste load allocations are based on the amount of a pollutant that a system can add to the stream, and not based on concentration of the waste stream. TSS restrictions in the NPDES permit should reflect the requirements of the TMDL and thus on limiting the pounds of TSS entering the stream, not on concentration or removal. By basing the discharge limits on pounds, concentration limits will automatically be adjusted for during periods of I/I and increases in the population will require the city to find ways of reducing their TSS loading to the stream.

The IDEQ believes, based on the information included above, that the TSS reduction requirement is excessive and should be removed from the permit. If the EPA believes that evidence exists that such a requirement is warranted to protect public health of water quality requirements for Jim Ford Creek, removal should be based on pounds per day and not on concentration.

Response: The waste load allocations in the TMDL are developed for water quality-based effluent limitations which are designed to protect human health and the water quality of Jim Ford Creek. The technology-based percent removal requirements are included in the EPA regulations at 40 CFR 133. The definition of percent removal is included in federal EPA regulations at 40 CFR 133.101(j), and defined as using concentration and not loading; therefore, the permit has not been changed.

There are only two situations where the removal rate for BOD and TSS for lagoons may be less than 65 percent. The first situation is where there is less concentrated influent for separate sewer systems and the second applies to less concentrated effluent for combined sewer systems. The City of Weippe facility is eligible for the exception under the first situation, according to 40 CFR § 133.103(d).

To be eligible for this exemption, the permittee must demonstrate satisfactorily that:

- i. the treatment works is consistently meeting its permit effluent concentration limits but its percent removal requirements cannot be met because of less concentrated influent wastewater;
- ii. to meet the percent removal requirements, the treatment works would have to achieve significantly more stringent limitations than would otherwise be required by the concentration-based standards, and
- iii. the less concentrated wastewater is not the result of excessive inflow/infiltration (I/I).

DMR data from 1995 through mid-2000 demonstrate compliance with both the concentration and loading limitations for BOD and the concentration limitations for TSS. The same data demonstrate that the percent removal cannot consistently be achieved due to the dilute influent (average influent concentration is 51 mg/l for BOD).

In order to meet the percent removal requirements, the facility would have to consistently achieve a concentration of less than 20 mg/l which is significantly more stringent than the equivalent-to-secondary treatment requirement of 45 mg/l for BOD.

A cost-effective analysis for I/I was included in the Facilities Plan prepared when the Weippe wastewater treatment plant was upgraded in 1988. That analysis concluded that it was more cost-effective to treat the I/I than to remove it.

EPA has determined that the Weippe facility meets the requirements of 40 CFR § 133.103(d) that state the percent removal requirements may be reduced or a mass loading limit may be substituted for the secondary treatment requirements at 40 CFR 105(a)(3) and (b)(3) that apply to this facility. EPA has data to support a less concentrated influent BOD which we conclude would also support a dilute influent TSS. The mass loading is determined using the following formula:

Design Population X 0.2 lbs/day/capita X expected % removal. For Weippe:

1,075 X 0.2 lbs/day/capita X 0.35 = 75 lbs/day Average Monthly

The allowable loading is then determined using the following formula:

Average Influent X Design Flow X Conversion Factor - Removal Amount. For Weippe:

$$51 \text{ mg/L} \times 0.536 \text{ mgd} \times 8.34 = 153 \text{ lbs/day average monthly}$$

The average weekly loading limitation is calculated at 1.5 times the average monthly limitation:

$$153 \times 1.5 = 230 \text{ lbs/day average weekly}$$

These loading limitations for BOD and TSS have been included in the final permit.

The minimum percent removal requirement for BOD and TSS has been replaced with these mass based loadings. However, percent removal for BOD and TSS must be reported on the Discharge Monitoring Reports (DMRs). The monthly average percent removal must be calculated from the arithmetic mean of the influent values and the arithmetic mean of the effluent values for that month using the following formula:

$$\% \text{ removal} = \frac{(\text{average monthly influent concentration} - \text{average monthly effluent concentration})}{\text{average monthly influent concentration}}$$

Influent and effluent samples must be taken over approximately the same time period.

Comment: Elimination of the Underdrain Discharge: The city agrees that the underdrain discharge must be eliminated, but they believe they should not have to pay for the engineering and construction costs to eliminate the problem. The drain system was required by IDEQ in August of 1991. The drain system leaked and another design change was made in 1992 to repair it. A total of approximately \$40,000 was spent on this system required by IDEQ. The city of Weippe requests that the IDEQ be responsible for the engineering and elimination of the underdrain system.

Response: The requirement to eliminate the underdrain is taken directly from the TMDL for Jim Ford Creek. EPA is required to include TMDL requirements in NPDES permits to meet water quality standards. Who should pay for eliminating the underdrain is an issue between the city and IDEQ. The requirement will remain in the permit.