State of Oregon
Department of Environmental Quality Memorandum

Date: March 30, 2012

To: Environmental Quality Commission

From: Dick Pedersen, Director

Subject: Agenda item N, Action item: Clean Water Services' request for a mass load increase for its Durham and Rock Creek wastewater treatment facilities April 25-27, 2012, EQC meeting

Purpose of this item

Clean Water Services operates four wastewater treatment plants in Washington County that discharge to the Tualatin River under a watershed permit. The facilities are the Durham, Rock Creek, Hillsboro and Forest Grove treatment plants. This agenda item requests that EQC grant an exception to EQC policy for this permit renewal. DEQ supports the proposed increase, which reinforces sustainable growth and development in the geographic area served by Clean Water Services.

DEQ recommendation and EQC motion

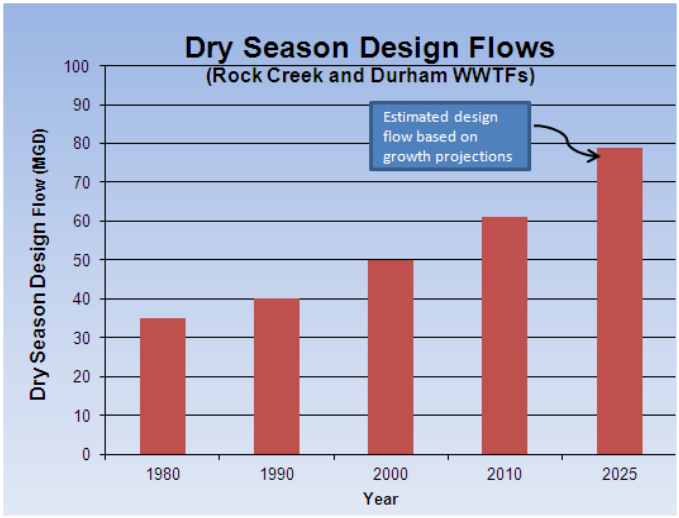
DEQ recommends that the commission approve the mass load increase based on Clean Water Services' request within its renewal application.

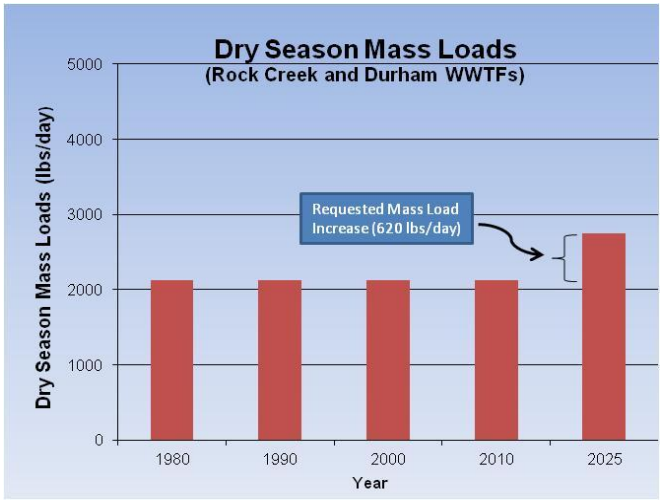
Background

Wastewater treatment plant permits include mass load limitations which are calculated using design flows and concentrations of pollutant parameters for discharges from the plant. Clean Water Services has requested a mass load increase as part of its application for renewal of its watershed-based permit. Oregon's water pollution rules include an anti-degradation policy, in OAR 340-041-0004, to protect and maintain water quality. Within those rules is a growth policy that states it is the general policy of EQC "to require that growth and development be accommodated by increased efficiency and effectiveness of waste treatment and control such that measurable future discharged waste loads from existing sources do not exceed presently allowed discharged loads."

DEQ established mass load limitations for Clean Water Services at the time of construction of its facilities, and the initial limits were based on engineer-defined dry weather design flow. In the early 1990s, EQC agreed to allow higher mass load limits during the wet season and that, as new facilities received design review, the mass loads would be based on what the treatment plant can reasonably be expected to achieve.

Clean Water Services has continually expanded and upgraded its treatment facilities to meet the needs of a rapidly growing Washington County over the past 40 years. Clean Water Services estimates that the necessary design flow at its facilities will more than double by 2025, when compared with the initial allocations from the 1970s. This increase, as seen in the charts below, is attributed to population growth in Washington County. The requested increase would raise the facility allocations by about 30 percent from the original dry season permit levels and about 34 percent from the current wet season permit levels.





Clean Water Services provided a detailed description of the proposed mass limitation increases including water quality analysis, land use findings, alternatives analysis and socioeconomic considerations in November 2010 in a document titled "Mass Load Increase for CBOD and TSS at the Rock Creek and Durham AWTFs." The document is

available upon request. In addition to seeking an exception from the growth policy for the mass load increase at the Durham and Rock Creek facilities, Clean Water Services renewal application is proposing to add dry season discharges at its Hillsboro and Forest Grove facilities that presently discharge only during the wet season. A separate EQC action item is anticipated at a later date to accommodate the additional dry season discharges.

Treatment technology and limitations

The Durham and Rock Creek facilities use advanced wastewater treatment technologies that include conventional secondary treatment enhanced to remove ammonia and phosphorous. They also use filtration to produce very low levels of carbonaceous biochemical oxygen demand and total suspended solids in the final effluent. This high level of treatment has been necessary to assure that Tualatin River water quality is protected. The Tualatin River had Oregon's first water quality management plan, known as a total maximum daily load or TMDL, and Clean Water Services' facilities were required to provide treatment capable of achieving strict standards for ammonia, phosphorous and dissolved oxygen. The treatment technology improvements have resulted in increased treatment efficiency. However, with anticipated population growth, the facilities will likely no longer be able to meet the present mass limits because much lower design flows were used to establish the limits. Approval of the proposed mass load increases would enable Clean Water Services to plan effectively for long-term growth, allow development and implementation of sustainable treatment technologies, fully utilize current investments and continue to improve water quality in the Tualatin River to provide the greatest overall ecological improvement.

Next steps

DEQ will draft documents for the Clean Water Services watershed-based permit renewal. DEQ will follow-up regarding possible upper river discharges, including:

- Evaluating proposed dry season discharges at Hillsboro and Forest Grove wastewater treatment plants
- Evaluating the use of natural treatment systems at both these facilities
- Updating the Tualatin TMDL to ensure consistency with state water quality objectives
- Returning to EQC once the TMDL update is approved to authorize the upper river discharges.

Attachments

A. DEQ's findings and supporting criteria for the proposed increase

Available upon request

1. NPDES permit renewal application, Volume 1, Section 6 (August 2008)
2. Mass Load Increase for CBOD and TSS at Rock Creek and Durham AWTFs (November 2010)
3. Land Use Compatibility Statement

Approved:

Division: _____

Section: _____

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Findings

DEQ's anti-degradation rule explicitly states that four findings are necessary to make an exception to its growth policy. The four findings are below, with specific information from the Clean Water Services permit application.

1. Determination that no expected damage to water quality will occur from the proposed increase
    - Clean Water Services has shown through modeling that its proposed increased discharge of wastewater would not damage water quality because the increased flow during dry season in the system will move the effluent through the system faster, negating any increased impact on dissolved oxygen. The watershed permit will continue to require stream monitoring by Clean Water Services to assure that water quality standards are met for dissolved oxygen. The effluent has lower total suspended solids concentration values than those observed in the river. Effluent concentrations are expected to remain the same; however, the increased discharge flow will mean higher loads in the river. DEQ anticipates no damage to water quality as the discharge will continue to dilute levels of total suspended solids in the Tualatin River.

2. Evaluation indicating the action is necessary and the benefits outweigh the environmental cost of reduced water quality
    - Clean Water Services has provided projections that it would be required to make costly changes to existing treatment technologies if the proposed increase is not approved. As noted above, no detrimental impacts to water quality are expected, so the added energy, carbon and ecological footprint associated with the adoption of alternative treatment technologies would outweigh the environmental cost of the additional discharge load.

3. Determination that the increased load will not unacceptably threaten or impair any recognized beneficial use
    - All applicable in-stream water quality standards will continue to be met even with the increased mass being discharged. Oregon's water quality standards are based on the conclusion that if in-stream standards are met, then the beneficial uses are not being impaired.

4. Establish that the increased load can be allowed under the total maximum daily load for the receiving stream
    - The Tualatin River has TMDLs established for ammonia, phosphorous, bacteria and temperature. The current permit includes the waste load allocations established through the TMDL process. The increased mass loads will not affect the ability of Clean Water Services to meet the established waste load allocations for ammonia, phosphorous and bacteria. Increased thermal loads will continue to meet permit conditions through the established permit trading program. The proposed increase in the mass loads is allowed in the Tualatin River TMDL.

Land use compatibility

A land use compatibility statements from Washington County confirm that the proposed mass load increases are consistent with appropriate conditions within the local land use plan.

Environmental effects criteria

In order to assure that the finite assimilative capacity of the Tualatin River continues to be recognized, in addition to meeting the above findings, OAR 340-041-0004(9)(c)(A) suggests that EQC may consider environmental effects in the following areas:

- Adverse out-of-stream effects
    - Increased energy usage and a projected increased carbon footprint are cited within Clean Water Service's analysis as the primary out-of-stream effects.
- In-stream effects
    - Clean Water Services has a long history of taking lower-efficiency treatment facilities out of service and treating wastes at advanced tertiary treatment facilities. However, the added flows from these facilities have resulted in some localized impacts due to these discharges. Clean Water Services updated its mixing zone evaluation at these facilities to evaluate the reasonable potential for these facilities to cause or contribute to water quality standards violations. The analysis found no reasonable potential to exceed water quality standards.
- Beneficial effects
    - The primary benefits established are the improved dissolved oxygen levels and increased flow in the stream. Clean Water Services will continue to provide stream flow augmentation during low-flow periods. It will also look for opportunities to incorporate new and innovative technologies at plant sites such as biological phosphorous removal, Ostara nutrient recovery systems and energy recovery from brown grease.

Economic effects criteria

Provided that the increased loading will not result in significantly greater adverse environmental effects than other alternatives to the increased mass discharge, two general types of economic effects should be considered:

- Value of assimilative capacity
    - Human activity has greatly influenced Tualatin River water quality, and this is expected to continue. The river's remaining assimilative capacity is largely due to efforts to improve wastewater treatment and holistically manage this river. The watershed permit will continue to promote measures intended to maintain and retain the available total assimilative capacity.
- Cost of treatment technology
    - Clean Water Services has indicated that without a mass load increase the next-stage treatment, considered to be membrane bioreactors and microfiltration, costs may approach $44 million. This technology would expand the carbon, energy and ecological footprints its wastewater treatment. Even if this technology were

adopted, it is not clear that the existing permit mass loads could be met in the future. DEQ agrees that significant additional expenditures for new treatment technologies at these facilities to meet current mass loads are not necessary to achieve water quality standards or prevent further degradation.

Conclusions

Clean Water Services has determined that it needs a mass load increase at this time to meet permit limits in the long-term. To accommodate the additional flows related to growth in the service area, Clean Water Services proposes to implement alternatives that are protective of water quality, economically prudent and environmentally sustainable. DEQ anticipates that granting this mass load increase will not negatively impact water quality in the Tualatin River. The discharge will not cause or contribute to violations of water quality standards.

DEQ supports the proposed mass load allocation increase.