

LIST CONDITIONS:

COMPARISON OF EFFLUENT LIMITS FOR DISCHARGES TO THE SNOQUALMIE RIVER WITH THE EXISTING PERMIT ISSUED IN NOVEMBER 1994.

| Parameters       | Existing Limits         |               |                       | Proposed Limits  |   |  |
|------------------|-------------------------|---------------|-----------------------|--|---|--|
|                  | Monthly Average         | Daily Maximum | Weekly Average        | Monthly Average  | Daily Maximum                             | Weekly Average   |
| BOD <sub>5</sub> | 30 mg/L, 58 lbs./day    | N/A           | 45 mg/L, 87 lbs./day  | 30 mg/L, 538 lbs./day (Nov.-July)                          | 15 mg/L, (TMDL, August, Sept., October)   | 45 mg/L, 807 lbs./day (Nov.-July)                          |
| TSS              | 60 mg/L, 115 lbs./day   | N/A           | 90 mg/L, 173 lbs./day | 30 mg/L, 538 lbs./day (Nov.-July) 450 lbs./day (Aug.-Oct.) | N/A                                       | 45 mg/L, 807 lbs./day (Nov.-July) 676 lbs./day (Aug.-Oct.) |
| Fecal Coliform   | 200/100 mL              |               | 400/100 mL            | 200/100 mL   | 400/100 mL (TMDL, August, Sept., October) | 400/100 mL   |
| Chlorine         | 65 µg/L, 0.12 lbs./day  | 190 µg/L      | N/A                   | N/A  | N/A                                       | N/A  |
| Ammonia          | 8.7 mg/L, 16.7 lbs./day | 15 mg/L       | N/A                   | N/A  | 5 mg/L (TMDL, August, Sept., October)     | N/A  |
| Copper           | 20 µg/L, 0.038 lbs./day | 35 µg/L       |                       | N/A  | N/A                                       | N/A  |
| Flow             | N/A                     | N/A           | N/A                   | N/A  | 1.8 MGD                                   | N/A  |

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The determination of the reasonable potential for these toxic chemicals to exceed the water quality criteria was evaluated with procedures given in EPA, 1991 (Appendix C) at the critical condition. The reasonable potential calculations indicated that there is no reasonable potential to exceed the water quality criteria at the critical condition. However, ammonia was limited based on a TMDL study that called for ammonia daily maximum limit of 5 mg/L.

**BOD<sub>5</sub>**—Under critical conditions there was a prediction of a violation of the dissolved oxygen criterion for the receiving water. A BOD<sub>5</sub> effluent limit of 15 mg/L or 269 lbs./day was found to be protective of the dissolved oxygen criterion and therefore was imposed instead of the technology-based limitation.

The impact of BOD on the receiving water was modeled at critical condition and with the technology-based effluent limitation for BOD<sub>5</sub> described under "Technology-Based Effluent Limitations" above and described in the "Snoqualmie River TMDL Study" by the Department of Ecology in May 1994.

**Fecal Coliform**—The numbers of fecal coliform were modeled by simple mixing analysis using the technology-based limit of 400 organisms per 100 ml and a dilution factor of 7:1.

Under critical conditions there is no predicted violation of the Water Quality Standards for Surface Waters with the technology-based limit. Therefore, the technology-based effluent limitation for fecal coliform bacteria was placed in the proposed permit.

K. Effluent Limit Summary

Table 12 summarizes the effluent limits that will be placed in the new permit for discharges through outfall #001. The table also provides a comparison with the limits placed in the previous permit.

Table 12. Comparison of Effluent Limits

|   | Previous Effluent Limits:<br>Outfall # 001 |                          |                  | Proposed Effluent Limits:<br>Outfall # 001       |                          |                  |
|---|--|--------------------------|------------------|--|--------------------------|------------------|
| Parameter   | Monthly<br>Average                         | Weekly<br>Average        | Daily<br>Maximum | Monthly<br>Average                               | Weekly<br>Average        | Daily<br>Maximum |
| Seasonal limits applicable November through July  |  |                          |                  |  |                          |                  |
| Biochemical<br>Oxygen Demand<br>(5-day)           | 30 mg/L,<br>538 lbs./day<br>85% removal    | 45 mg/L,<br>807 lbs./day | N/A              | N/A  | N/A                      | N/A              |
| CBOD  | Not Used in Previous Permit                |                          |                  | 25 mg/L,<br>259 lbs./day<br>85% removal          | 40 mg/L,<br>414 lbs./day | N/A              |
| Total<br>Suspended<br>Solids                      | 30 mg/L,<br>538 lbs./day<br>85% removal    | 45 mg/L,<br>807 lbs./day | N/A              | 30 mg/L,<br>310 lbs./day<br>85% removal          | 45 mg/L,<br>465 lbs./day | N/A              |
| Fecal Coliform<br>Bacteria                        | 200/100mL                                  | 400/100mL                | N/A              | 200/100mL  | 400/100mL                | N/A              |
| pH  | Between 6.0 and 9.0                        |                          |                  | Between 6.0 and 9.0                              |                          |                  |
| Seasonal limits applicable August through October |  |                          |                  |  |                          |                  |
| Biochemical<br>Oxygen Demand<br>(5-day)           | 85% removal                                | N/A                      | 15 mg/L          | N/A  | N/A                      | N/A              |
| CBOD  | Not Used in Previous Permit                |                          |                  | 25 mg/L,<br>259 lbs./day<br>85% removal          | 40 mg/L,<br>414 lbs./day | 206 lbs/day      |
| Total<br>Suspended<br>Solids                      | 30 mg/L,<br>450 lbs./day<br>85% removal    | 45 mg/L,<br>676 lbs./day | N/A              | 30 mg/L,<br>310 lbs./day<br>85% removal          | 45 mg/L,<br>465 lbs./day | N/A              |
| Fecal Coliform<br>Bacteria                        | N/A  | N/A                      | 400/100mL        | 200/100mL  | 400/100mL                | N/A              |
| pH  | Between 6.0 and 9.0                        |                          |                  | Between 6.0 and 9.0                              |                          |                  |
| Total Ammonia<br>(as NH <sub>3</sub> -N)          | N/A  | N/A                      | 5 mg/L           | N/A  | N/A                      | 68.7 lbs/day     |
| Flow  | N/A  | N/A                      | 1.8 MGD          | No discharge limit, only facility loading limit. |                          |                  |

A review of the 1994 *Snoqualmie River Total Maximum Daily Load Study* (Publication Number 94-71) indicates that the TMDL-based limits (August through October) in the previous permit were misstated. The actual waste load allocations for the City are "Mass-based," not "Concentration-based," and there was also no enforceable limit on flow. In addition, the Biochemical Oxygen Demand parameter stated in the TMDL was intended as a limit on only the carbonaceous portion of the total biochemical oxygen demand; the nitrogenous portion was covered by the ammonia limit. The new permit will correct these errors by removing the flow limit, include seasonal mass-based limits and will change BOD monitoring to CBOD.

Table 10. TMDL-Based Waste Load Allocations

| Parameter                                  | Waste Load Allocation  |
|--|--|
| Critical Period for Waste Load Allocations | August 1 <sup>st</sup> through October 31 <sup>st</sup> Annually |
| CBOD                                       | 206 lbs/day  |
| Ammonia-N                                  | 68.7 lbs/day (as N)  |
| Soluble Reactive Phosphorus (benchmark)*   | 14 lbs/day   |
| Fecal Coliform                             | Meet technology-based limits                                     |

\* The TMDL does not contain an enforceable limit for Soluble Reactive Phosphorus; the WLA is a desired "goal" for the discharger. The permit does not include this value as an enforceable limit and will only require monitoring.

K. Comparison of effluent limits with the last permit, modified on July 1, 2011

Table 17. Comparison of Previous and Proposed Effluent Limits, Outfall 001

| Parameter  | Previous Effluent Limits:      |                             | Proposed Effluent Limits:      |                             |
|--|--------------------------------|-----------------------------|--------------------------------|-----------------------------|
|  | Average Monthly                | Average Weekly              | Average Monthly                | Average Weekly              |
| CBOD <sub>5</sub> Concentration Limits                             | 25 mg/L                        | 40 mg/L                     | 25 mg/L                        | 40 mg/L                     |
| CBOD <sub>5</sub> Mass Limits Effective Nov.-July Only             | 85% Removal                    | 448 lbs/day                 | 85% Removal                    | 448 lbs/day                 |
| Total Suspended Solids   | 30 mg/L                        | 45 mg/L                     | 30 mg/L                        | 45 mg/L                     |
|  | 538 lbs/day 85% Removal        | 807 lbs/day                 | 538 lbs/day 85% Removal        | 807 lbs/day                 |
| Parameter  | Monthly Geometric Mean Limit   | Weekly Geometric Mean Limit | Monthly Geometric Mean Limit   | Weekly Geometric Mean Limit |
| Fecal Coliform Bacteria  | 200/100 ml                     | 400/100 ml                  | 200/100 ml                     | 400/100 ml                  |
| Parameter  | Limit                          |                             | Limit                          |                             |
| pH   | Within the range of 6.0 to 9.0 |                             | Within the range of 6.3 to 9.0 |                             |
| Parameter  | Average Monthly                | Maximum Daily               | Average Monthly                | Maximum Daily               |
| Total Residual Chlorine  | 37 µg/L                        | 70 µg/L                     | 20 µg/L                        | 52 µg/L                     |
| Parameter  | Previous Effluent Limits:      |                             | Proposed Effluent Limits:      |                             |
|  | Average Monthly                | Average Weekly              | Average Monthly                | MAXIMUM DAILY               |
| CBOD <sub>5</sub> , Seasonal mass limit Effective Aug-Oct. Only    | N/A                            | 206 lbs/day                 | 51.6 lbs/day                   | 206 lbs/day                 |
| Total Ammonia (as N), Seasonal mass limit Effective July-Oct. Only | N/A                            | 68.7 lbs/day                | 21.9 lbs/day                   | 68.7 lbs/day                |
| Temperature, 7DADMAX Effective June – Sept. Only                   | N/A                            | N/A                         | N/A                            | 24.7° C                     |

The 1994 *Snoqualmie River Total Maximum Daily Load Study* established waste load allocations (WLAs) for CBOD<sub>5</sub> and ammonia for discharges occurring during the August – October critical season. Waste load allocations for the Snoqualmie WWTWRF are:

- 206 lbs/day CBOD<sub>5</sub>
- 68.7 lbs/day Ammonia ( as N)

The WLA listed above are the maximum daily limits (MDL) for those parameters. According to federal NPDES regulations, all permit limits must be expressed as both average monthly and maximum daily limits. The average monthly limit (AML) is calculated according to the method in EPA's Technical Support Document for Water Quality-based Toxics Control (1991). See Appendix E for detailed calculations. The AML calculation is affected by effluent variability and number of samples per month. Ecology calculated the average monthly limit based on 12 sampling events per month (3 per week) for CBOD<sub>5</sub> and 4 sampling events per month (1 per week) for ammonia. The calculated coefficients of variation (CV) used are 1.77 and 2.29 for CBOD<sub>5</sub> and ammonia, respectively. Average monthly limits (AML) for the proposed permit are:

- 51.6 lbs/day CBOD<sub>5</sub>
- 21.9 lbs/day Ammonia ( as N)

The proposed permit will include water quality-based mass limits for CBOD<sub>5</sub> and total ammonia during the critical season and technology-based mass limits for CBOD<sub>5</sub> only during the non-critical season. CBOD<sub>5</sub> concentration limits apply throughout the year.

Table 15. TMDL-Based Waste Load Allocations

| Parameter                                | Waste Load Allocation        | Critical Period for WLA                           |
|--|------------------------------|---|
| Temperature                              | 24.7 °C                      | June 1 <sup>st</sup> – September 30 <sup>th</sup> |
| CBOD                                     | 206 lbs/day                  | August 1 <sup>st</sup> – October 31 <sup>st</sup> |
| Ammonia-N                                | 68.7 lbs/day (as N)          | August 1 <sup>st</sup> – October 31 <sup>st</sup> |
| Soluble Reactive Phosphorus <sup>1</sup> | 14 lbs/day (as P)            | August 1 <sup>st</sup> – October 31 <sup>st</sup> |
| Fecal Coliform                           | Meet technology-based limits | August 1 <sup>st</sup> – October 31 <sup>st</sup> |

<sup>1</sup> The TMDL does not include required WLAs for Soluble Reactive Phosphorus (Orthophosphate), but it does include "recommended goals" for dischargers. The value listed above reflects this recommended goal for the Snoqualmie WWTWRF. Ecology does not enforce recommended WLA goals as permit limits and only includes it in this fact sheet for informational purposes.