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DEPARTMENT OF ECOLOGY

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SUBJECT: Continuous simulation of ammonia WLAs for the City of Enumclaw NPDES permit

## Summary

This memorandum presents an analysis of waste load allocations (WLAs) for ammonia for the discharge to the White River by the City of Enumclaw using dynamic modeling techniques that are consistent with Ecology and EPA guidance. The use of continuous simulation models was proposed by the City of Enumclaw in their June 1995 Appellant Settlement Plan for NPDES Permit Number WA-002057-5. This memo presents the results of continuous simulation for the November-April permit period. WLAs based on continuous simulation are also compared with WLAs based on two independent steady-state analyses from the following sources:

- WLAs proposed by Ecology in the draft NPDES permit; and
- WLAs proposed in an attachment to the Appellant Settlement Plan by a consultant to the City of Enumclaw (originally contained in a November 18, 1994 memo to the City of Enumclaw by Bill Fox, Cosmopolitan Engineering)

Proposed WLAs to meet acute and chronic aquatic life criteria are presented in the following table with the corresponding daily maximum and monthly average limits for effluent concentrations (all units are mg/L of total ammonia as N):

| | Acute WLA | Chronic WLA | Daily Maximum | Monthly Average |
|---|---|---|---|---|
| Proposed in the draft NPDES permit based on steady-state analysis: | 9.1 | 5.4 | 9 | 4 |
| Proposed in the Appellant Settlement Plan based on steady-state analysis by Bill Fox: | 15.4 | 8.58 | 14.1 | 8.6 |
| Continuous simulation in this memo | | | | |
| 3-year return period: | 9.54 | 7.12 | 9.5 | 4.2 |
| 10-year return period: | 8.92 | 6.20 | 8.9 | 3.9 |

The continuous simulation predicts a time series of allowable effluent concentrations of ammonia based on actual combinations of river flow and effluent flow during the November-April permit period between 1987 and 1995. The proposed WLAs and permit limits based on continuous simulation are predicted to protect the magnitude, duration, and frequency requirements of the water quality standard for un-ionized ammonia in the White River. The limits proposed in the draft NPDES permit are similar to the continuous simulation results and also are predicted to protect the water quality standard. The results of continuous simulation support the use of the limits proposed in the draft permit. The limits proposed in the Appellant Settlement Plan based on steady-state analysis by Bill Fox were not predicted to meet the water quality standard.

The following sections of this memo present the results of continuous simulation modeling in detail.

## Introduction

The ammonia limits in the draft NPDES permit for the November-April season are based on steady-state modeling using a combination of expected maximum effluent flows (*e.g.*, 4.0 mgd for evaluation of limits to meet acute criteria) and expected minimum river flows (110 cfs). This combination of conditions is consistent with Ecology and EPA guidance for steady-state modeling of WLAs (Ecology, 1991; Ecology, 1994; EPA, 1991). The Appellant Settlement Plan proposed the use of continuous simulation to develop WLAs from realistic combinations of river and effluent flows.

EPA defines steady-state and continuous simulation as follows (EPA, 1991):

- *steady-state model* is a fate and transport model that uses constant values of input variables to predict constant values of receiving water quality concentrations.

- *continuous simulation model* is a fate and transport model that uses time series input data to predict receiving water quality concentrations in the same chronological order as that of the input variables.

An analysis by Bill Fox in a November 18, 1994, memo to the City of Enumclaw (Fox, 1994), which is attached to the Appellant Settlement Plan, uses constant values of input variables to predict constant values of effluent concentrations which correspond to constant values of receiving water quality concentrations. Therefore, the analysis in the plan is a steady-state analysis by EPA's definition. Furthermore, the steady-state input variables selected in the analysis in the plan are not consistent with Ecology guidance (Ecology, 1991; Ecology, 1994), and are not consistent with the EPA guidance cited in the plan (EPA, 1991).

The analysis in the plan also does not predict receiving water quality concentrations or corresponding effluent concentrations in the same chronological order as that of the input variables. This additionally confirms that the analysis in the plan is not a continuous simulation according to EPA guidance. Further, EPA recommends that application of dynamic modeling techniques (including continuous simulation) should incorporate the return frequency requirements of the standards. The return frequency provision of the standards is neglected in the steady-state analysis presented in the plan.

It may be appropriate to consider alternative ammonia limits for the Enumclaw discharge by application of some of the principles of continuous simulation or dynamic modeling techniques. However, the analysis presented in the plan is not an acceptable application of methods suggested by EPA guidance.

This memo documents an analysis of existing data which applies continuous modeling techniques that are consistent with Ecology and EPA guidance. WLAs for ammonia based on the results of continuous simulation are presented below.

## Methods and Results

Continuous simulation models use time series input data to predict an output variable in the same chronological order as that of the input variables. The continuous simulation analysis documented in this memo uses time series values of input variables to predict time series values of maximum effluent concentrations which correspond to acceptable receiving water quality concentrations. The resulting time series of maximum allowable effluent concentrations were then summarized to select statistics which correspond to the specified magnitude, duration, and frequency of the water quality standard for ammonia.

The results of the continuous simulation are presented in Appendix A. The continuous simulation was accomplished by the following steps:

- *Step 1: Tabulate daily values of river and effluent flows for the November-April season from 1987 through 1995.* The period of record was selected to contain data which represent current operations of the diversion from the White River at Buckley to Lake Tapps by Puget Sound Power and Light Company. Daily stream flow records were obtained from the US Geological Survey ADAPS database system. Daily effluent flows were obtained from Discharge Monitoring Reports for the NPDES permit.

- *Step 2: Calculate the maximum allowable dilution factors for each daily combination of river and effluent flows based on maximum percentages of river flows allowed in WAC 173-201A-100.* The mixing zone rule in the water quality standards allows no more than 25 percent of the river flow to be used to meet the chronic criteria and no more than 2.5 percent to meet the acute criteria. The maximum allowable dilution factors (DF) based on upstream river flows ($Q_u$ in cfs from USGS station 12100000) and effluent flows ($Q_e$ in cfs) were estimated as follows for each daily combination of river and effluent flow:

$$DF_{acute} = (0.025Q_u + Q_e)/Q_e$$

$$DF_{chronic} = (0.25Q_u + Q_e)/Q_e$$

- *Step 3: Estimate dilution factors at the boundaries of the acute and chronic mixing zone for each daily combination of river and effluent flows using the RIVPLUM model.* The RIVPLUM model predicts dilution at the mixing zone boundary based on a method presented by Fischer *et al.* (1979). The RIVPLUM model yields results which are identical to the method used by Bill Fox in the November 18, 1994 memo for the same input variables. The equations for the RIVPLUM model are documented in Ecology's Permit Writer's Manual (Ecology, 1994). An example of the RIVPLUM calculation for the continuous simulation is presented in Appendix B. The format of the RIVPLUM model was rearranged to fit on a single row of the spreadsheet so that it could be copied to each row of the time series of input variables. Velocity (V in ft/sec) and depth (D in ft) were estimated based on relationships with river flow ($Q=Q_u+Q_e$ in cfs downstream from the effluent discharge) presented in Pelletier (1993): $V=0.095Q^{0.56}$; and $D=0.19Q^{0.3}$. River width was calculated based on continuity as Q/(DV). Other input variables for the RIVPLUM model were similar to those documented by Fox (1994).

- *Step 4: Select the most limiting acute and chronic dilution factors for each daily combination of river and effluent flows.* The lowest dilution factor from Step 2 and 3 was selected for each mixing zone boundary (acute and chronic) for each daily combination of river and effluent flows.

- *Step 5: Calculate the maximum allowable effluent concentrations which would meet the acute and chronic ammonia criteria for each daily combination of river and effluent flows.* The acute and chronic WLAs for effluent ammonia were calculated for each daily combination of river and effluent flows as the maximum effluent concentrations which would meet the acute and chronic criteria in the river. It was necessary to assume constant values for ammonia criteria and upstream ammonia concentrations because time series data were not available. This assumption was also made by Fox (1994). Conservative estimates of ammonia criteria and upstream concentrations were selected based on the

critical 10th or 90th percentile for the season. The acute and chronic criteria were assumed to be 9.1 and 1.7 mg/L of ammonia as N, which are the same criteria assumed by Fox (1994) and also used in the draft NPDES permit (seasonal 10th percentiles). The upstream background concentration of ammonia was assumed to equal 0.1 mg/L as N, which was also assumed by Fox (1994) and used in the draft NPDES permit (seasonal 90th percentile). The acute and chronic WLAs (in mg/L of ammonia as N) for each daily effluent dilution factor from Step 4 were estimated by mass balance as follows:

$$\text{Acute WLA} = 9.1\ DF_{acute} - 0.1\ (DF_{acute} - 1)$$

$$\text{Chronic WLA} = 1.7\ DF_{chronic} - 0.1\ (DF_{chronic} - 1)$$

- *Step 6: Calculate 4-day running averages of chronic WLAs to correspond with the duration specified in the water quality standards.* The chronic criteria for ammonia is specified as a 4-day average duration. Therefore, 4-day running averages of the chronic WLAs from Step 5 were calculated for application of the chronic criteria.

- *Step 7: Calculate the acute and chronic WLAs which correspond to the allowable return period specified in the water quality standards.* The water quality standards specify that that the ammonia criteria are concentrations which must not be exceeded more than once every 3 years on average. Therefore, an annual return period of 3 years was used to evaluate the acute and chronic WLAs. An annual return period of 10 years was also evaluated to provide a margin of safety in consideration of scientific uncertainty introduced by various simplifying assumptions in the continuous simulation analysis. The time series of acute and 4-day-average chronic WLAs were summarized to select WLAs that correspond to the specified return periods.

Evaluation of seasonal permit periods requires consideration of the annual probability of violating water quality standards under a seasonal program compared with year-round programs (Rossman, 1989; Lence *et al.*, 1990). The goal for seasonal permit programs is to maintain risk equivalency with a non-seasonal year-round permit program (Ecology, 1992). For example, Rossman (1989) noted that if the same return period is used for monthly and annual permit programs, then there is a greatly increased risk of violating water quality standards in the monthly compared with year-round program. Hatcher (1982) showed a seven-fold increase in water quality violations resulting from monthly permit limits based on monthly 7Q10 flows compared with year-round permits based on annual 7Q10 flows. EPA (1984) suggests adjusting the return period to approximate the same risk in seasonal permit programs as in non-seasonal year-round programs.

The return period for meeting the ammonia criteria during the November-April season was selected to maintain the allowable annual return period. The return period (Y) for seasonal permit periods which corresponds to the allowed annual probability (*e.g.* P=1/3 for an annual three year return period) is related to the number of permitting periods (N) within the year by the following equation (EPA, 1984):

$$Y = \{1 - (1 - P)^{1/N}\}^{-1}$$

Therefore, semi-annual permit periods require that the criteria are not exceeded more than once every 5.4 years in each season to maintain an annual risk of exceeding criteria of no more than once every 3 years. Similarly, a seasonal return period of 20 years is equivalent to an annual return period of 10 years. Seasonal return periods of 5.4 and 20 years were selected for equivalence with annual return periods of 3 and 10 years for evaluation of the acute and chronic WLAs during the November-April permit period.

The acute and chronic WLAs which correspond to annual return periods of 3 and 10 years were found by the following method:

- *Step 7a. Select the lowest acute and chronic WLA from the continuous simulation of each November-April period.* For each November-April period between 1987 and 1995 the lowest 1-day average acute WLA and 4-day average chronic WLA were selected. The selected WLAs were also transformed using the base 10 logarithm so that normal and log-normal probability distributions could be evaluated. Both normal and log-normal distributions were found to fit the data equally well (based on normal probability plots implemented in the program WQHYDRO, Aroner, 1992). A log-normal distribution was selected to represent the data based on recommendations by EPA (EPA, 1991).

- *Step 7b. Calculate the acute and chronic WLAs corresponding to the specified return periods.* The WLAs which correspond to the annual return periods were estimated by frequency analysis (Haan, 1977). The values of the normal deviate (Z) which correspond to the annual return periods of 3 and 10 years are 0.902 and 1.645. The acute and chronic WLAs were found by the following formulas from the means and standard deviations of the log-transformed values ($\mu_{log}$ and $\sigma_{log}$) from Step 7a assuming a log-normal distribution (Haan, 1977; Berthouex and Brown, 1994):

$$\text{acute WLA} = 10\text{^}(\mu_{log,acute} - Z\,\sigma_{log,acute})$$

$$\text{chronic WLA} = 10\text{^}(\mu_{log,chronic} - Z\,\sigma_{log,chronic})$$

In summary, the proposed WLAs and permit limits based on continuous simulation are predicted to protect the magnitude, duration, and frequency requirements of the water quality standard for un-ionized ammonia in the White River. The limits proposed in the draft NPDES permit are similar to the continuous simulation results and also are predicted to protect the water quality standard. The results of continuous simulation support the use of the limits proposed in the draft permit. The limits proposed in the Appellant Settlement Plan based on steady-state analysis by Bill Fox were not predicted to meet the water quality standard.

## References

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- *Step 8. Calculate the daily maximum and monthly average permit limits corresponding to the acute and chronic WLAs.* The formulas in chapter VI, section 3.3.7 of Ecology's permit Writer's Manual (Ecology, 1994) were used to calculate the daily maximum and monthly average permit limits corresponding to the acute and chronic WLA from Step 7b. The assumptions and calculation of the permit limits are presented in Appendix C of this memo.

The recommended WLAs and permit limits are presented in the following table and compared with WLAs and limits proposed based on steady-state modeling for the draft permit and by Fox (1994) (all units are mg/L of total ammonia as N):

| | Acute WLA | Chronic WLA | Daily Maximum Limit | Monthly Average Limit |
|---|---|---|---|---|
| Proposed in the draft NPDES permit based on steady-state analysis: | 9.1 | 5.4 | 9 | 4 |
| Proposed in the Appellant Settlement Plan based on steady-state analysis by Fox (1994): | 15.4 | 8.58 | 14.1 | 8.6 |
| Continuous simulation in this memo | | | | |
| 3-year return period: | 9.54 | 7.12 | 9.5 | 4.2 |
| 10-year return period: | 8.92 | 6.20 | 8.9 | 3.9 |

The WLAs and permit limits that are based on continuous simulation are similar to those proposed in the draft permit and substantially more restrictive than those proposed by Fox (1994).

The predicted time-series of acute and chronic WLAs from the continuous simulation are presented in Figures 1 and 2 with comparison to WLAs proposed by Fox (1994) and WLAs calculated from frequency analysis of the continuous simulation (Step 7b). The WLAs proposed by Fox (1994) are found to result in numerous extended periods during which water quality standards would not have been met between 1987 and 1995. Excursions of simulated WLAs below the values proposed by Fox (1994) indicate that water quality standards would not have been met during those periods. Effluent concentrations would need to be lower than the WLAs proposed by Fox to meet the standard during the simulation.

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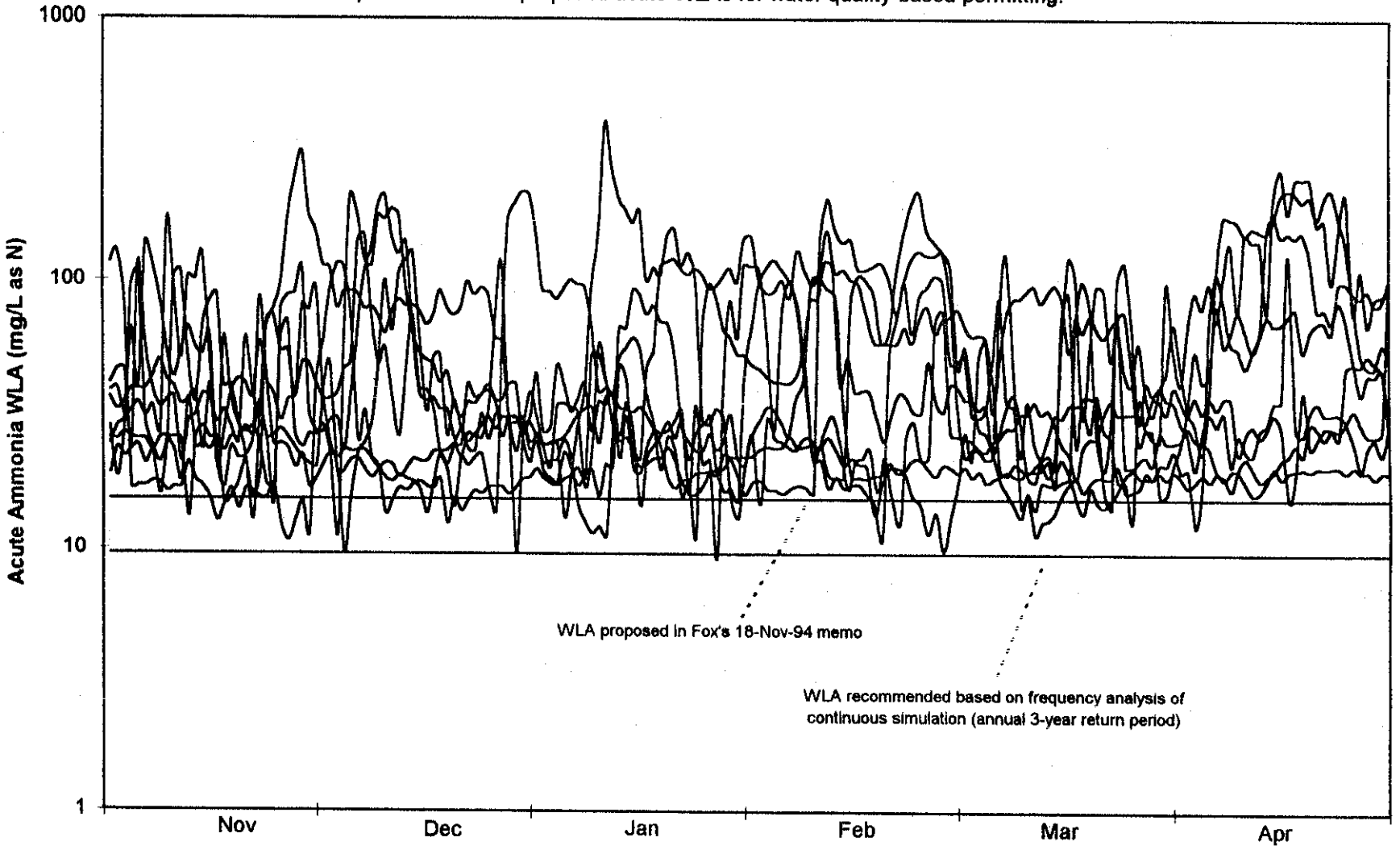
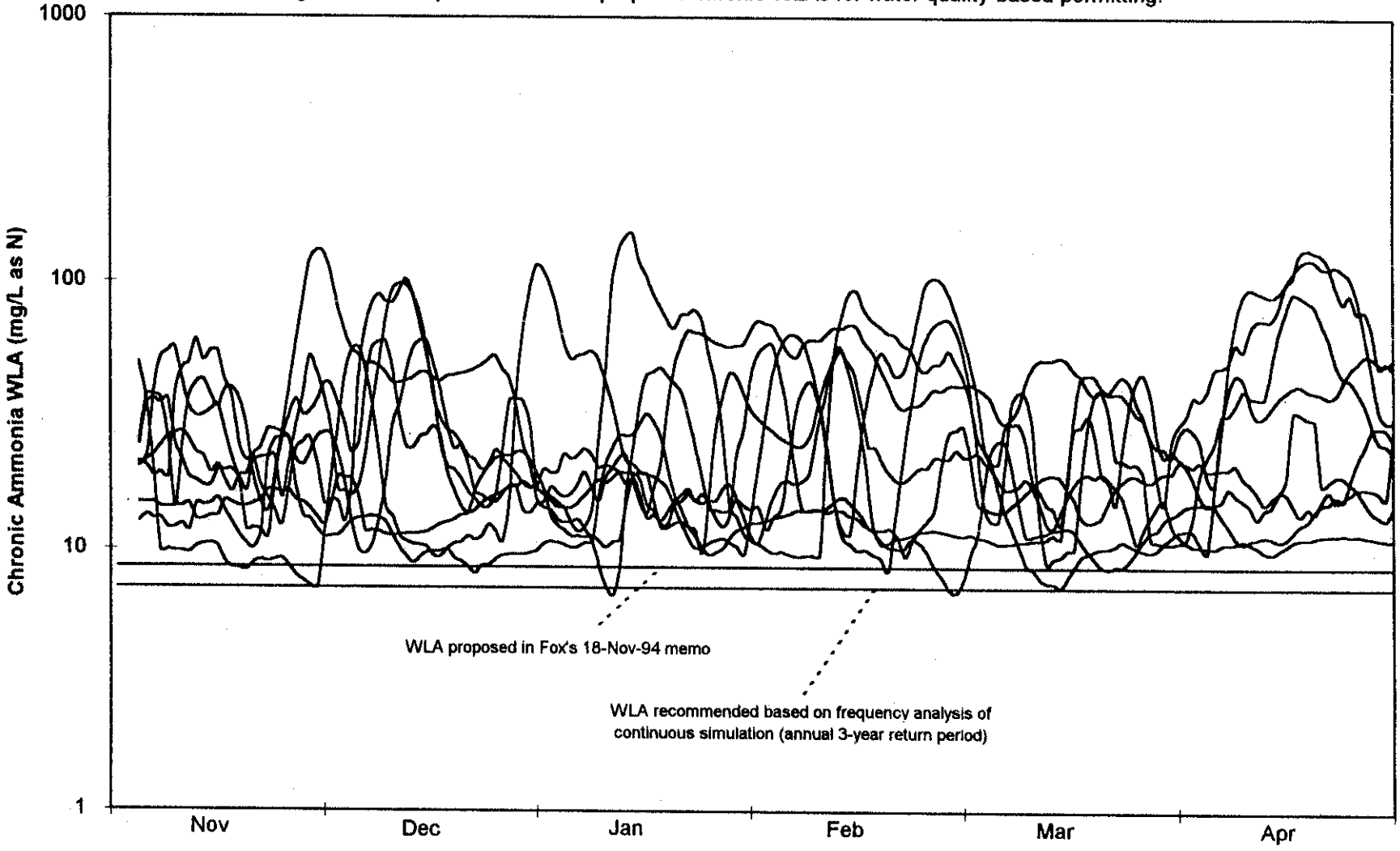
Figure 1. Acute ammonia WLAs for Enumclaw: comparison of continuously simulated acute WLAs during November-April 1987-95 with proposed acute WLAs for water quality-based permitting.




ENUMFLO3.XLW\Chart Acute WLAs, 8/8/95

Figure 2. Chronic ammonia WLAs for Enumclaw: comparison of continuously simulated chronic WLAs (4-day averages) during November-April 1987-95 with proposed chronic WLAs for water quality-based permitting.




ENUMFLO3.XLW\Chart Chronic WLAs, 8/8/95

# Appendix A

Results of continuous simulation of ammonia WLAs for the City of Enumclaw during the November-April permit season

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mg/N/L, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs) | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mg/N/L) | Acute (mg/N/L) | Chronic (mg/N/L) |
| 01-Nov-87 | 0.8 | 1.238 | 156 | 32.5 | 4.2 | 13.1 | 4.1 | 13.1 | 4.1 | 21.0 | 37.3 | |
| 02-Nov-87 | 0.9 | 1.392 | 158 | 29.4 | 3.8 | 11.8 | 3.7 | 11.8 | 3.7 | 18.9 | 33.6 | |
| 03-Nov-87 | 0.8 | 1.238 | 149 | 31.1 | 4.0 | 12.6 | 4.0 | 12.6 | 4.0 | 20.3 | 36.0 | |
| 04-Nov-87 | 0.7 | 1.083 | 149 | 35.4 | 4.4 | 14.4 | 4.6 | 14.4 | 4.4 | 23.1 | 40.1 | 20.8 |
| 05-Nov-87 | 0.7 | 1.083 | 149 | 35.4 | 4.4 | 14.4 | 4.6 | 14.4 | 4.4 | 23.1 | 40.1 | 21.4 |
| 06-Nov-87 | 0.7 | 1.083 | 150 | 35.6 | 4.5 | 14.5 | 4.6 | 14.5 | 4.5 | 23.3 | 40.3 | 22.5 |
| 07-Nov-87 | 0.6 | 0.928 | 148 | 40.9 | 5.0 | 16.7 | 5.3 | 16.7 | 5.0 | 26.8 | 45.0 | 24.1 |
| 08-Nov-87 | 0.5 | 0.774 | 145 | 47.9 | 5.7 | 19.7 | 6.2 | 19.7 | 5.7 | 31.6 | 51.3 | 26.2 |
| 09-Nov-87 | 0.6 | 0.928 | 141 | 39.0 | 4.8 | 16.1 | 5.1 | 16.1 | 4.8 | 25.8 | 43.3 | 26.9 |
| 10-Nov-87 | 0.6 | 0.928 | 132 | 36.5 | 4.6 | 15.2 | 4.8 | 15.2 | 4.6 | 24.5 | 41.1 | 27.2 |
| 11-Nov-87 | 0.8 | 1.238 | 145 | 30.3 | 3.9 | 12.3 | 3.9 | 12.3 | 3.9 | 19.8 | 35.2 | 25.4 |
| 12-Nov-87 | 0.7 | 1.083 | 133 | 31.7 | 4.1 | 13.2 | 4.2 | 13.2 | 4.1 | 21.1 | 36.7 | 22.8 |
| 13-Nov-87 | 0.7 | 1.083 | 144 | 34.2 | 4.3 | 14.0 | 4.4 | 14.0 | 4.3 | 22.5 | 39.0 | 22.0 |
| 14-Nov-87 | 1.1 | 1.702 | 132 | 20.4 | 2.9 | 8.4 | 2.6 | 8.4 | 2.6 | 13.5 | 23.9 | 19.2 |
| 15-Nov-87 | 0.6 | 0.928 | 135 | 37.4 | 4.6 | 15.5 | 4.9 | 15.5 | 4.6 | 24.9 | 41.8 | 20.5 |
| 16-Nov-87 | 1.5 | 2.321 | 162 | 18.5 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.7 | 20.7 | 18.1 |
| 17-Nov-87 | 1 | 1.547 | 143 | 24.1 | 3.3 | 9.8 | 3.1 | 9.8 | 3.1 | 15.7 | 27.9 | 16.5 |
| 18-Nov-87 | 0.7 | 1.083 | 144 | 34.2 | 4.3 | 14.0 | 4.4 | 14.0 | 4.3 | 22.5 | 39.0 | 18.7 |
| 19-Nov-87 | 0.6 | 0.928 | 142 | 39.2 | 4.8 | 16.2 | 5.1 | 16.2 | 4.8 | 25.9 | 43.5 | 19.0 |
| 20-Nov-87 | 0.6 | 0.928 | 136 | 37.6 | 4.7 | 15.6 | 4.9 | 15.6 | 4.7 | 25.1 | 42.1 | 22.3 |
| 21-Nov-87 | 0.7 | 1.083 | 138 | 32.9 | 4.2 | 13.5 | 4.3 | 13.5 | 4.2 | 21.8 | 37.8 | 23.8 |
| 22-Nov-87 | 0.4 | 0.619 | 140 | 57.6 | 6.7 | 23.9 | 7.6 | 23.9 | 6.7 | 38.4 | 60.0 | 27.8 |
| 23-Nov-87 | 0.6 | 0.928 | 140 | 38.7 | 4.8 | 16.0 | 5.1 | 16.0 | 4.8 | 25.7 | 43.0 | 27.7 |
| 24-Nov-87 | 0.7 | 1.083 | 143 | 34.0 | 4.3 | 13.9 | 4.4 | 13.9 | 4.3 | 22.4 | 38.8 | 27.0 |
| 25-Nov-87 | 0.9 | 1.392 | 140 | 26.1 | 3.5 | 10.7 | 3.4 | 10.7 | 3.4 | 17.2 | 30.5 | 25.9 |
| 26-Nov-87 | 0.7 | 1.083 | 132 | 31.5 | 4.0 | 13.1 | 4.1 | 13.1 | 4.0 | 21.0 | 36.5 | 21.6 |
| 27-Nov-87 | 0.7 | 1.083 | 137 | 32.6 | 4.2 | 13.5 | 4.3 | 13.5 | 4.2 | 21.6 | 37.6 | 20.6 |
| 28-Nov-87 | 0.5 | 0.774 | 141 | 46.6 | 5.6 | 19.3 | 6.1 | 19.3 | 5.6 | 30.9 | 50.1 | 22.7 |
| 29-Nov-87 | 0.5 | 0.774 | 140 | 46.2 | 5.5 | 19.2 | 6.1 | 19.2 | 5.5 | 30.7 | 49.8 | 26.1 |
| 30-Nov-87 | 0.6 | 0.928 | 137 | 37.9 | 4.7 | 15.7 | 5.0 | 15.7 | 4.7 | 25.2 | 42.3 | 27.1 |
| 01-Dec-87 | 0.8 | 1.238 | 147 | 30.7 | 4.0 | 12.5 | 3.9 | 12.5 | 3.9 | 20.1 | 35.6 | 26.7 |
| 02-Dec-87 | 1.1 | 1.702 | 143 | 22.0 | 3.1 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.4 | 22.6 |
| 03-Dec-87 | 1.7 | 2.630 | 177 | 17.8 | 2.7 | 6.9 | 2.2 | 6.9 | 2.2 | 11.1 | 19.6 | 17.7 |
| 04-Dec-87 | 3 | 4.642 | 145 | 8.8 | 1.8 | 3.4 | 1.1 | 3.4 | 1.1 | 5.5 | 9.6 | 12.7 |
| 05-Dec-87 | 1.6 | 2.476 | 125 | 13.6 | 2.3 | 5.5 | 1.7 | 5.5 | 1.7 | 8.9 | 15.8 | 10.0 |
| 06-Dec-87 | 1.3 | 2.011 | 157 | 20.5 | 3.0 | 8.1 | 2.6 | 8.1 | 2.6 | 13.1 | 23.2 | 9.6 |
| 07-Dec-87 | 1 | 1.547 | 126 | 21.4 | 3.0 | 8.8 | 2.8 | 8.8 | 2.8 | 14.3 | 25.3 | 10.4 |
| 08-Dec-87 | 0.9 | 1.392 | 139 | 26.0 | 3.5 | 10.6 | 3.4 | 10.6 | 3.4 | 17.1 | 30.3 | 13.3 |
| 09-Dec-87 | 1.1 | 1.702 | 341 | 51.1 | 6.0 | 17.8 | 5.6 | 17.8 | 5.6 | 28.6 | 50.8 | 18.3 |
| 10-Dec-87 | 4 | 6.189 | 3990 | 162.2 | 17.1 | 35.4 | 11.2 | 35.4 | 11.2 | 56.7 | 100.8 | 29.2 |
| 11-Dec-87 | 3.5 | 5.415 | 1990 | 92.9 | 10.2 | 23.1 | 7.3 | 23.1 | 7.3 | 37.1 | 65.9 | 34.9 |
| 12-Dec-87 | 1.6 | 2.476 | 1380 | 140.4 | 14.9 | 37.6 | 11.9 | 37.6 | 11.9 | 60.3 | 107.2 | 45.7 |
| 13-Dec-87 | 1.2 | 1.857 | 1120 | 151.8 | 16.1 | 42.4 | 13.4 | 42.4 | 13.4 | 68.0 | 120.8 | 55.5 |
| 14-Dec-87 | 1 | 1.547 | 981 | 159.5 | 16.9 | 45.8 | 14.5 | 45.8 | 14.5 | 73.3 | 130.3 | 59.7 |
| 15-Dec-87 | 1 | 1.547 | 405 | 66.4 | 7.5 | 22.5 | 7.1 | 22.5 | 7.1 | 36.1 | 64.1 | 59.4 |
| 16-Dec-87 | 1 | 1.547 | 177 | 29.6 | 3.9 | 11.6 | 3.7 | 11.6 | 3.7 | 18.7 | 33.1 | 49.0 |
| 17-Dec-87 | 0.8 | 1.238 | 239 | 49.3 | 5.8 | 18.4 | 5.8 | 18.4 | 5.8 | 29.5 | 52.5 | 39.4 |
| 18-Dec-87 | 0.7 | 1.083 | 216 | 50.9 | 6.0 | 19.4 | 6.1 | 19.4 | 6.0 | 31.1 | 54.0 | 28.8 |
| 19-Dec-87 | 0.9 | 1.392 | 120 | 22.5 | 3.2 | 9.4 | 3.0 | 9.4 | 3.0 | 15.2 | 27.0 | 23.6 |
| 20-Dec-87 | 0.7 | 1.083 | 131 | 31.2 | 4.0 | 13.0 | 4.1 | 13.0 | 4.0 | 20.9 | 36.3 | 24.2 |
| 21-Dec-87 | 1.2 | 1.857 | 184 | 25.8 | 3.5 | 10.0 | 3.2 | 10.0 | 3.2 | 16.1 | 28.5 | 20.8 |
| 22-Dec-87 | 1.2 | 1.857 | 150 | 21.2 | 3.0 | 8.5 | 2.7 | 8.5 | 2.7 | 13.7 | 24.2 | 16.5 |
| 23-Dec-87 | 1.1 | 1.702 | 130 | 20.1 | 2.9 | 8.3 | 2.6 | 8.3 | 2.6 | 13.3 | 23.6 | 16.0 |
| 24-Dec-87 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 15.3 |
| 25-Dec-87 | 1 | 1.547 | 131 | 22.2 | 3.1 | 9.1 | 2.9 | 9.1 | 2.9 | 14.7 | 26.1 | 15.0 |
| 26-Dec-87 | 0.8 | 1.238 | 130 | 27.3 | 3.6 | 11.3 | 3.6 | 11.3 | 3.6 | 18.2 | 32.3 | 16.1 |
| 27-Dec-87 | 0.8 | 1.238 | 126 | 26.4 | 3.5 | 11.0 | 3.5 | 11.0 | 3.5 | 17.8 | 31.5 | 17.2 |
| 28-Dec-87 | 0.8 | 1.238 | 126 | 26.4 | 3.5 | 11.0 | 3.5 | 11.0 | 3.5 | 17.8 | 31.5 | 17.1 |
| 29-Dec-87 | 0.8 | 1.238 | 126 | 26.4 | 3.5 | 11.0 | 3.5 | 11.0 | 3.5 | 17.8 | 31.5 | 17.9 |
| 30-Dec-87 | 0.9 | 1.392 | 122 | 22.9 | 3.2 | 9.6 | 3.0 | 9.6 | 3.0 | 15.4 | 27.3 | 17.2 |
| 31-Dec-87 | 0.8 | 1.238 | 125 | 26.2 | 3.5 | 11.0 | 3.5 | 11.0 | 3.5 | 17.6 | 31.3 | 17.1 |
| 01-Jan-88 | 0.5 | 0.774 | 127 | 42.0 | 5.1 | 17.7 | 5.6 | 17.7 | 5.1 | 28.4 | 46.0 | 19.8 |
| 02-Jan-88 | 0.9 | 1.392 | 125 | 23.4 | 3.2 | 9.8 | 3.1 | 9.8 | 3.1 | 15.7 | 27.9 | 19.3 |
| 03-Jan-88 | 0.9 | 1.392 | 130 | 24.3 | 3.3 | 10.1 | 3.2 | 10.1 | 3.2 | 16.2 | 28.7 | 19.5 |
| 04-Jan-88 | 0.5 | 0.774 | 137 | 45.3 | 5.4 | 18.8 | 6.0 | 18.8 | 5.4 | 30.2 | 48.9 | 22.6 |
| 05-Jan-88 | 0.6 | 0.928 | 134 | 37.1 | 4.6 | 15.4 | 4.9 | 15.4 | 4.6 | 24.8 | 41.6 | 21.7 |
| 06-Jan-88 | 0.8 | 1.238 | 134 | 28.1 | 3.7 | 11.6 | 3.7 | 11.6 | 3.7 | 18.6 | 33.1 | 22.5 |
| 07-Jan-88 | 0.7 | 1.083 | 134 | 31.9 | 4.1 | 13.2 | 4.2 | 13.2 | 4.1 | 21.3 | 36.9 | 23.7 |
| 08-Jan-88 | 0.6 | 0.928 | 137 | 37.9 | 4.7 | 15.7 | 5.0 | 15.7 | 4.7 | 25.2 | 42.3 | 22.5 |
| 09-Jan-88 | 1 | 1.547 | 142 | 23.9 | 3.3 | 9.7 | 3.1 | 9.7 | 3.1 | 15.7 | 27.8 | 20.2 |
| 10-Jan-88 | 0.8 | 1.238 | 149 | 31.1 | 4.0 | 12.6 | 4.0 | 12.6 | 4.0 | 20.3 | 36.0 | 20.6 |
| 11-Jan-88 | 0.8 | 1.238 | 144 | 30.1 | 3.9 | 12.3 | 3.9 | 12.3 | 3.9 | 19.7 | 35.0 | 20.2 |
| 12-Jan-88 | 0.7 | 1.083 | 142 | 33.8 | 4.3 | 13.9 | 4.4 | 13.9 | 4.3 | 22.3 | 38.6 | 19.5 |
| 13-Jan-88 | 1.1 | 1.702 | 153 | 23.5 | 3.2 | 9.4 | 3.0 | 9.4 | 3.0 | 15.1 | 26.8 | 19.4 |
| 14-Jan-88 | 1.5 | 2.321 | 324 | 35.9 | 4.5 | 12.6 | 4.0 | 12.6 | 4.0 | 20.2 | 35.8 | 19.3 |
| 15-Jan-88 | 4.8 | 7.427 | 980 | 34.0 | 4.3 | 9.6 | 3.0 | 9.6 | 3.0 | 15.4 | 27.3 | 18.3 |
| 16-Jan-88 | 2.5 | 3.868 | 196 | 13.7 | 2.3 | 5.1 | 1.6 | 5.1 | 1.6 | 8.2 | 14.6 | 14.7 |
| 17-Jan-88 | 1.5 | 2.321 | 178 | 20.2 | 2.9 | 7.8 | 2.5 | 7.8 | 2.5 | 12.6 | 22.3 | 14.1 |
| 18-Jan-88 | 1.2 | 1.857 | 154 | 21.7 | 3.1 | 8.7 | 2.7 | 8.7 | 2.7 | 14.0 | 24.7 | 12.5 |
| 19-Jan-88 | 1 | 1.547 | 137 | 23.1 | 3.2 | 9.5 | 3.0 | 9.5 | 3.0 | 15.2 | 27.0 | 12.5 |
| 20-Jan-88 | 0.9 | 1.392 | 139 | 26.0 | 3.5 | 10.6 | 3.4 | 10.6 | 3.4 | 17.1 | 30.3 | 14.7 |
| 21-Jan-88 | 1 | 1.547 | 133 | 22.5 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.9 | 26.4 | 15.3 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mgN/L, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs): | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mgN/L) | Acute (mgN/L) | Chronic (mgN/L) |
| 22-Jan-88 | 0.9 | 1.392 | 140 | 26.1 | 3.5 | 10.7 | 3.4 | 10.7 | 3.4 | 17.2 | 30.5 | 16.1 |
| 23-Jan-88 | 1.3 | 2.011 | 145 | 19.0 | 2.8 | 7.6 | 2.4 | 7.6 | 2.4 | 12.3 | 21.8 | 15.4 |
| 24-Jan-88 | 1 | 1.547 | 138 | 23.3 | 3.2 | 9.5 | 3.0 | 9.5 | 3.0 | 15.3 | 27.2 | 14.9 |
| 25-Jan-88 | 0.9 | 1.392 | 135 | 25.2 | 3.4 | 10.4 | 3.3 | 10.4 | 3.3 | 16.7 | 29.6 | 15.4 |
| 26-Jan-88 | 0.9 | 1.392 | 135 | 25.2 | 3.4 | 10.4 | 3.3 | 10.4 | 3.3 | 16.7 | 29.6 | 15.3 |
| 27-Jan-88 | 0.8 | 1.238 | 139 | 29.1 | 3.8 | 11.9 | 3.8 | 11.9 | 3.8 | 19.2 | 34.1 | 17.0 |
| 28-Jan-88 | 0.9 | 1.392 | 145 | 27.0 | 3.6 | 11.0 | 3.5 | 11.0 | 3.5 | 17.7 | 31.3 | 17.6 |
| 29-Jan-88 | 2 | 3.094 | 162 | 14.1 | 2.3 | 5.4 | 1.7 | 5.4 | 1.7 | 8.8 | 15.6 | 15.6 |
| 30-Jan-88 | 2 | 3.094 | 130 | 11.5 | 2.1 | 4.6 | 1.4 | 4.6 | 1.4 | 7.4 | 13.1 | 13.3 |
| 31-Jan-88 | 1.3 | 2.011 | 131 | 17.3 | 2.6 | 7.0 | 2.2 | 7.0 | 2.2 | 11.4 | 20.1 | 11.3 |
| 01-Feb-88 | 1 | 1.547 | 135 | 22.8 | 3.2 | 9.3 | 3.0 | 9.3 | 3.0 | 15.0 | 26.7 | 10.7 |
| 02-Feb-88 | 0.9 | 1.392 | 139 | 26.0 | 3.5 | 10.6 | 3.4 | 10.6 | 3.4 | 17.1 | 30.3 | 12.7 |
| 03-Feb-88 | 0.8 | 1.238 | 140 | 29.3 | 3.8 | 12.0 | 3.8 | 12.0 | 3.8 | 19.3 | 34.3 | 15.7 |
| 04-Feb-88 | 0.8 | 1.238 | 138 | 28.9 | 3.8 | 11.9 | 3.8 | 11.9 | 3.8 | 19.1 | 33.9 | 17.6 |
| 05-Feb-88 | 0.9 | 1.392 | 138 | 25.8 | 3.5 | 10.6 | 3.3 | 10.6 | 3.3 | 17.0 | 30.1 | 18.1 |
| 06-Feb-88 | 1 | 1.547 | 137 | 23.1 | 3.2 | 9.5 | 3.0 | 9.5 | 3.0 | 15.2 | 27.0 | 17.6 |
| 07-Feb-88 | 0.9 | 1.392 | 178 | 33.0 | 4.2 | 12.9 | 4.1 | 12.9 | 4.1 | 20.8 | 36.9 | 18.0 |
| 08-Feb-88 | 1.1 | 1.702 | 283 | 42.6 | 5.2 | 15.3 | 4.9 | 15.3 | 4.9 | 24.7 | 43.8 | 19.4 |
| 09-Feb-88 | 1.2 | 1.857 | 729 | 99.2 | 10.8 | 30.0 | 9.5 | 30.0 | 9.5 | 48.2 | 85.6 | 27.2 |
| 10-Feb-88 | 1.6 | 2.476 | 1040 | 106.0 | 11.5 | 30.0 | 9.5 | 30.0 | 9.5 | 48.1 | 85.5 | 35.4 |
| 11-Feb-88 | 1.7 | 2.630 | 1710 | 163.5 | 17.3 | 42.1 | 13.3 | 42.1 | 13.3 | 67.5 | 119.9 | 47.1 |
| 12-Feb-88 | 1.4 | 2.166 | 1290 | 149.9 | 15.9 | 40.7 | 12.9 | 40.7 | 12.9 | 65.3 | 116.1 | 57.3 |
| 13-Feb-88 | 1.2 | 1.857 | 296 | 40.9 | 5.0 | 14.6 | 4.6 | 14.6 | 4.6 | 23.4 | 41.6 | 51.1 |
| 14-Feb-88 | 0.9 | 1.392 | 277 | 50.7 | 6.0 | 18.4 | 5.8 | 18.4 | 5.8 | 29.6 | 52.5 | 46.4 |
| 15-Feb-88 | 1.2 | 1.857 | 276 | 38.2 | 4.7 | 13.8 | 4.4 | 13.8 | 4.4 | 22.2 | 39.4 | 35.1 |
| 16-Feb-88 | 1.1 | 1.702 | 251 | 37.9 | 4.7 | 13.9 | 4.4 | 13.9 | 4.4 | 22.4 | 39.8 | 24.4 |
| 17-Feb-88 | 0.9 | 1.392 | 192 | 35.5 | 4.4 | 13.7 | 4.3 | 13.7 | 4.3 | 22.1 | 39.2 | 24.1 |
| 18-Feb-88 | 0.9 | 1.392 | 144 | 26.9 | 3.6 | 10.9 | 3.5 | 10.9 | 3.5 | 17.6 | 31.2 | 21.1 |
| 19-Feb-88 | 1 | 1.547 | 128 | 21.7 | 3.1 | 9.0 | 2.8 | 9.0 | 2.8 | 14.4 | 25.6 | 19.1 |
| 20-Feb-88 | 0.9 | 1.392 | 150 | 27.9 | 3.7 | 11.3 | 3.6 | 11.3 | 3.6 | 18.1 | 32.2 | 18.1 |
| 21-Feb-88 | 0.7 | 1.083 | 143 | 34.0 | 4.3 | 13.9 | 4.4 | 13.9 | 4.3 | 22.4 | 38.8 | 18.1 |
| 22-Feb-88 | 0.7 | 1.083 | 137 | 32.6 | 4.2 | 13.5 | 4.3 | 13.5 | 4.2 | 21.6 | 37.6 | 19.2 |
| 23-Feb-88 | 0.8 | 1.238 | 134 | 28.1 | 3.7 | 11.6 | 3.7 | 11.6 | 3.7 | 18.6 | 33.1 | 20.2 |
| 24-Feb-88 | 0.8 | 1.238 | 133 | 27.9 | 3.7 | 11.5 | 3.6 | 11.5 | 3.6 | 18.5 | 32.9 | 20.3 |
| 25-Feb-88 | 0.7 | 1.083 | 201 | 47.4 | 5.6 | 18.3 | 5.8 | 18.3 | 5.6 | 29.4 | 50.9 | 22.1 |
| 26-Feb-88 | 0.7 | 1.083 | 133 | 31.7 | 4.1 | 13.2 | 4.2 | 13.2 | 4.1 | 21.1 | 36.7 | 21.9 |
| 27-Feb-88 | 0.8 | 1.238 | 134 | 28.1 | 3.7 | 11.6 | 3.7 | 11.6 | 3.7 | 18.6 | 33.1 | 21.9 |
| 28-Feb-88 | 0.6 | 0.928 | 135 | 37.4 | 4.6 | 15.5 | 4.9 | 15.5 | 4.6 | 24.9 | 41.8 | 23.5 |
| 29-Feb-88 | 0.6 | 0.928 | 131 | 36.3 | 4.5 | 15.1 | 4.8 | 15.1 | 4.5 | 24.3 | 40.9 | 22.3 |
| 01-Mar-88 | 0.7 | 1.083 | 134 | 31.9 | 4.1 | 13.2 | 4.2 | 13.2 | 4.1 | 21.3 | 36.9 | 22.3 |
| 02-Mar-88 | 0.7 | 1.083 | 133 | 31.7 | 4.1 | 13.2 | 4.2 | 13.2 | 4.1 | 21.1 | 36.7 | 22.9 |
| 03-Mar-88 | 0.8 | 1.238 | 137 | 28.7 | 3.8 | 11.8 | 3.7 | 11.8 | 3.7 | 19.0 | 33.7 | 21.4 |
| 04-Mar-88 | 0.8 | 1.238 | 143 | 29.9 | 3.9 | 12.2 | 3.9 | 12.2 | 3.9 | 19.6 | 34.8 | 20.3 |
| 05-Mar-88 | 1.2 | 1.857 | 143 | 20.3 | 2.9 | 8.2 | 2.6 | 8.2 | 2.6 | 13.2 | 23.3 | 18.2 |
| 06-Mar-88 | 1 | 1.547 | 142 | 23.9 | 3.3 | 9.7 | 3.1 | 9.7 | 3.1 | 15.7 | 27.8 | 16.9 |
| 07-Mar-88 | 0.8 | 1.238 | 140 | 29.3 | 3.8 | 12.0 | 3.8 | 12.0 | 3.8 | 19.3 | 34.3 | 16.9 |
| 08-Mar-88 | 0.9 | 1.392 | 186 | 34.4 | 4.3 | 13.4 | 4.2 | 13.4 | 4.2 | 21.5 | 38.2 | 17.4 |
| 09-Mar-88 | 2.4 | 3.713 | 476 | 33.0 | 4.2 | 10.7 | 3.4 | 10.7 | 3.4 | 17.2 | 30.6 | 18.4 |
| 10-Mar-88 | 2.3 | 3.559 | 248 | 18.4 | 2.7 | 6.6 | 2.1 | 6.6 | 2.1 | 10.7 | 19.0 | 17.2 |
| 11-Mar-88 | 1.8 | 2.785 | 171 | 16.4 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.2 | 18.0 | 14.9 |
| 12-Mar-88 | 1.4 | 2.166 | 161 | 19.6 | 2.9 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 22.0 | 12.6 |
| 13-Mar-88 | 1.1 | 1.702 | 153 | 23.5 | 3.2 | 9.4 | 3.0 | 9.4 | 3.0 | 15.1 | 26.8 | 12.1 |
| 14-Mar-88 | 0.9 | 1.392 | 150 | 27.9 | 3.7 | 11.3 | 3.6 | 11.3 | 3.6 | 18.1 | 32.2 | 14.0 |
| 15-Mar-88 | 0.9 | 1.392 | 145 | 27.0 | 3.6 | 11.0 | 3.5 | 11.0 | 3.5 | 17.7 | 31.3 | 15.8 |
| 16-Mar-88 | 0.8 | 1.238 | 144 | 30.1 | 3.9 | 12.3 | 3.9 | 12.3 | 3.9 | 19.7 | 35.0 | 17.7 |
| 17-Mar-88 | 0.8 | 1.238 | 144 | 30.1 | 3.9 | 12.3 | 3.9 | 12.3 | 3.9 | 19.7 | 35.0 | 18.8 |
| 18-Mar-88 | 0.8 | 1.238 | 144 | 30.1 | 3.9 | 12.3 | 3.9 | 12.3 | 3.9 | 19.7 | 35.0 | 19.2 |
| 19-Mar-88 | 1 | 1.547 | 142 | 23.9 | 3.3 | 9.7 | 3.1 | 9.7 | 3.1 | 15.7 | 27.8 | 18.7 |
| 20-Mar-88 | 0.7 | 1.083 | 141 | 33.5 | 4.3 | 13.8 | 4.4 | 13.8 | 4.3 | 22.1 | 38.4 | 19.3 |
| 21-Mar-88 | 1 | 1.547 | 144 | 24.3 | 3.3 | 9.8 | 3.1 | 9.8 | 3.1 | 15.8 | 28.1 | 18.3 |
| 22-Mar-88 | 1.1 | 1.702 | 149 | 22.9 | 3.2 | 9.2 | 2.9 | 9.2 | 2.9 | 14.8 | 26.3 | 17.1 |
| 23-Mar-88 | 1.8 | 2.785 | 171 | 16.4 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.2 | 18.0 | 15.7 |
| 24-Mar-88 | 1.8 | 2.785 | 168 | 16.1 | 2.5 | 6.2 | 2.0 | 6.2 | 2.0 | 10.0 | 17.8 | 12.7 |
| 25-Mar-88 | 2.8 | 4.332 | 192 | 12.1 | 2.1 | 4.5 | 1.4 | 4.5 | 1.4 | 7.3 | 12.8 | 10.6 |
| 26-Mar-88 | 3.5 | 5.415 | 934 | 44.1 | 5.3 | 12.6 | 4.0 | 12.6 | 4.0 | 20.3 | 36.0 | 11.9 |
| 27-Mar-88 | 4.8 | 7.427 | 1020 | 35.3 | 4.4 | 9.9 | 3.1 | 9.9 | 3.1 | 15.9 | 28.2 | 13.4 |
| 28-Mar-88 | 2.4 | 3.713 | 429 | 29.9 | 3.9 | 9.9 | 3.1 | 9.9 | 3.1 | 15.9 | 28.1 | 14.8 |
| 29-Mar-88 | 2.6 | 4.023 | 228 | 15.2 | 2.4 | 5.5 | 1.7 | 5.5 | 1.7 | 8.9 | 15.8 | 15.2 |
| 30-Mar-88 | 2.3 | 3.559 | 203 | 15.3 | 2.4 | 5.7 | 1.8 | 5.7 | 1.8 | 9.2 | 16.2 | 12.5 |
| 31-Mar-88 | 1.7 | 2.630 | 194 | 19.4 | 2.8 | 7.4 | 2.3 | 7.4 | 2.3 | 11.9 | 21.1 | 11.5 |
| 01-Apr-88 | 1.4 | 2.166 | 189 | 22.8 | 3.2 | 8.7 | 2.8 | 8.7 | 2.8 | 14.1 | 25.0 | 11.0 |
| 02-Apr-88 | 1.6 | 2.476 | 327 | 34.0 | 4.3 | 11.9 | 3.8 | 11.9 | 3.8 | 19.1 | 33.9 | 13.6 |
| 03-Apr-88 | 2.9 | 4.487 | 1270 | 71.8 | 8.1 | 19.5 | 6.2 | 19.5 | 6.2 | 31.2 | 55.5 | 19.1 |
| 04-Apr-88 | 3.3 | 5.106 | 1080 | 53.9 | 6.3 | 15.0 | 4.7 | 15.0 | 4.7 | 24.1 | 42.8 | 22.1 |
| 05-Apr-88 | 2.4 | 3.713 | 780 | 53.5 | 6.3 | 15.9 | 5.0 | 15.9 | 5.0 | 25.5 | 45.3 | 25.0 |
| 06-Apr-88 | 2.5 | 3.868 | 1680 | 109.6 | 11.9 | 28.2 | 8.9 | 28.2 | 8.9 | 45.3 | 80.5 | 31.5 |
| 07-Apr-88 | 4.3 | 6.653 | 2190 | 83.3 | 9.2 | 20.3 | 6.4 | 20.3 | 6.4 | 32.6 | 58.0 | 31.9 |
| 08-Apr-88 | 2.8 | 4.332 | 1460 | 85.3 | 9.4 | 22.5 | 7.1 | 22.5 | 7.1 | 36.1 | 64.2 | 34.9 |
| 09-Apr-88 | 1.9 | 2.940 | 1130 | 97.1 | 10.6 | 27.0 | 8.5 | 27.0 | 8.5 | 43.3 | 77.0 | 39.3 |
| 10-Apr-88 | 1.5 | 2.321 | 693 | 75.7 | 8.5 | 23.1 | 7.3 | 23.1 | 7.3 | 37.0 | 65.8 | 37.3 |
| 11-Apr-88 | 1.2 | 1.857 | 421 | 57.7 | 6.7 | 19.3 | 6.1 | 19.3 | 6.1 | 31.0 | 55.1 | 36.9 |
| 12-Apr-88 | 1.1 | 1.702 | 464 | 69.2 | 7.8 | 22.8 | 7.2 | 22.8 | 7.2 | 36.6 | 65.0 | 37.0 |
| 13-Apr-88 | 1.1 | 1.702 | 1400 | 206.7 | 21.6 | 55.4 | 17.5 | 55.4 | 17.5 | 88.7 | 157.7 | 48.3 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mg/L, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs): | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mg/L) | Acute (mg/L) | Chronic (mg/L) |
| 14-Apr-88 | 1 | 1.547 | 1500 | 243.4 | 25.2 | 64.4 | 20.4 | 64.4 | 20.4 | 103.1 | 183.3 | 64.9 |
| 15-Apr-88 | 1.1 | 1.702 | 1320 | 194.9 | 20.4 | 52.8 | 16.7 | 52.8 | 16.7 | 84.6 | 150.4 | 78.2 |
| 16-Apr-88 | 1 | 1.547 | 1230 | 199.7 | 20.9 | 54.9 | 17.4 | 54.9 | 17.4 | 87.9 | 156.3 | 91.1 |
| 17-Apr-88 | 1 | 1.547 | 1160 | 188.4 | 19.7 | 52.4 | 16.6 | 52.4 | 16.6 | 83.9 | 149.1 | 89.9 |
| 18-Apr-88 | 0.9 | 1.392 | 1070 | 193.1 | 20.2 | 54.5 | 17.2 | 54.5 | 17.2 | 87.3 | 155.2 | 85.9 |
| 19-Apr-88 | 0.9 | 1.392 | 801 | 144.8 | 15.4 | 43.2 | 13.7 | 43.2 | 13.7 | 69.2 | 123.0 | 82.1 |
| 20-Apr-88 | 1 | 1.547 | 515 | 84.2 | 9.3 | 27.3 | 8.6 | 27.3 | 8.6 | 43.7 | 77.7 | 71.0 |
| 21-Apr-88 | 0.8 | 1.238 | 399 | 81.6 | 9.1 | 27.8 | 8.8 | 27.8 | 8.8 | 44.5 | 79.1 | 61.2 |
| 22-Apr-88 | 0.9 | 1.392 | 400 | 72.8 | 8.2 | 24.7 | 7.8 | 24.7 | 7.8 | 39.7 | 70.5 | 49.3 |
| 23-Apr-88 | 0.7 | 1.083 | 366 | 85.5 | 9.4 | 29.6 | 9.4 | 29.6 | 9.4 | 47.4 | 84.3 | 43.8 |
| 24-Apr-88 | 0.8 | 1.238 | 350 | 71.7 | 8.1 | 25.0 | 7.9 | 25.0 | 7.9 | 40.1 | 71.2 | 42.9 |
| 25-Apr-88 | 1.1 | 1.702 | 348 | 52.1 | 6.1 | 18.1 | 5.7 | 18.1 | 5.7 | 29.1 | 51.6 | 39.1 |
| 26-Apr-88 | 1.3 | 2.011 | 296 | 37.8 | 4.7 | 13.5 | 4.3 | 13.5 | 4.3 | 21.7 | 38.4 | 34.6 |
| 27-Apr-88 | 0.9 | 1.392 | 231 | 42.5 | 5.1 | 15.9 | 5.0 | 15.9 | 5.0 | 25.6 | 45.4 | 29.1 |
| 28-Apr-88 | 0.9 | 1.392 | 229 | 42.1 | 5.1 | 15.8 | 5.0 | 15.8 | 5.0 | 25.4 | 45.1 | 25.4 |
| 29-Apr-88 | 1.3 | 2.011 | 387 | 49.1 | 5.8 | 16.7 | 5.3 | 16.7 | 5.3 | 26.8 | 47.6 | 24.9 |
| 30-Apr-88 | 1.6 | 2.476 | 246 | 25.8 | 3.5 | 9.5 | 3.0 | 9.5 | 3.0 | 15.2 | 27.0 | 23.3 |
| 01-Nov-88 | 1 | 1.547 | 150 | 25.2 | 3.4 | 10.2 | 3.2 | 10.2 | 3.2 | 16.4 | 29.0 | |
| 02-Nov-88 | 1.6 | 2.476 | 156 | 16.8 | 2.6 | 6.6 | 2.1 | 6.6 | 2.1 | 10.6 | 18.8 | |
| 03-Nov-88 | 2.6 | 4.023 | 506 | 32.4 | 4.1 | 10.4 | 3.3 | 10.4 | 3.3 | 16.7 | 29.6 | |
| 04-Nov-88 | 2 | 3.094 | 1000 | 81.8 | 9.1 | 23.3 | 7.4 | 23.3 | 7.4 | 37.3 | 66.3 | 20.3 |
| 05-Nov-88 | 3.8 | 5.879 | 1230 | 53.3 | 6.2 | 14.5 | 4.6 | 14.5 | 4.6 | 23.3 | 41.3 | 22.0 |
| 06-Nov-88 | 2.1 | 3.249 | 2690 | 208.0 | 21.7 | 49.1 | 15.5 | 49.1 | 15.5 | 78.6 | 139.7 | 39.0 |
| 07-Nov-88 | 1.7 | 2.630 | 1670 | 159.7 | 16.9 | 41.3 | 13.1 | 41.3 | 13.1 | 66.2 | 117.6 | 51.3 |
| 08-Nov-88 | 1.7 | 2.630 | 1130 | 108.4 | 11.7 | 30.2 | 9.5 | 30.2 | 9.5 | 48.4 | 86.0 | 54.1 |
| 09-Nov-88 | 1.8 | 2.785 | 696 | 63.5 | 7.2 | 19.3 | 6.1 | 19.3 | 6.1 | 31.0 | 55.1 | 56.0 |
| 10-Nov-88 | 2.3 | 3.559 | 723 | 51.8 | 6.1 | 15.6 | 4.9 | 15.6 | 4.9 | 25.1 | 44.5 | 42.7 |
| 11-Nov-88 | 1.9 | 2.940 | 741 | 64.0 | 7.3 | 19.2 | 6.1 | 19.2 | 6.1 | 30.9 | 54.9 | 33.8 |
| 12-Nov-88 | 1.6 | 2.476 | 772 | 79.0 | 8.8 | 23.6 | 7.5 | 23.6 | 7.5 | 37.9 | 67.3 | 31.2 |
| 13-Nov-88 | 1.8 | 2.785 | 732 | 66.7 | 7.6 | 20.1 | 6.4 | 20.1 | 6.4 | 32.3 | 57.4 | 31.5 |
| 14-Nov-88 | 1.6 | 2.476 | 584 | 60.0 | 6.9 | 18.9 | 6.0 | 18.9 | 6.0 | 30.3 | 53.8 | 32.8 |
| 15-Nov-88 | 1.2 | 1.857 | 506 | 69.1 | 7.8 | 22.4 | 7.1 | 22.4 | 7.1 | 36.0 | 63.9 | 34.1 |
| 16-Nov-88 | 2.8 | 4.332 | 349 | 21.1 | 3.0 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.5 | 27.5 |
| 17-Nov-88 | 3.3 | 5.106 | 340 | 17.6 | 2.7 | 6.0 | 1.9 | 6.0 | 1.9 | 9.7 | 17.1 | 21.9 |
| 18-Nov-88 | 1.7 | 2.630 | 232 | 23.1 | 3.2 | 8.5 | 2.7 | 8.5 | 2.7 | 13.7 | 24.3 | 17.7 |
| 19-Nov-88 | 1.7 | 2.630 | 205 | 20.5 | 2.9 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 22.0 | 11.8 |
| 20-Nov-88 | 1.8 | 2.785 | 217 | 20.5 | 2.9 | 7.6 | 2.4 | 7.6 | 2.4 | 12.3 | 21.8 | 12.0 |
| 21-Nov-88 | 2.7 | 4.177 | 233 | 14.9 | 2.4 | 5.4 | 1.7 | 5.4 | 1.7 | 8.7 | 15.5 | 11.8 |
| 22-Nov-88 | 4.2 | 6.498 | 549 | 22.1 | 3.1 | 6.9 | 2.2 | 6.9 | 2.2 | 11.1 | 19.7 | 11.1 |
| 23-Nov-88 | 2.7 | 4.177 | 1580 | 95.6 | 10.5 | 24.9 | 7.9 | 24.9 | 7.9 | 39.9 | 70.9 | 18.0 |
| 24-Nov-88 | 1.8 | 2.785 | 1010 | 91.7 | 10.1 | 26.0 | 8.2 | 26.0 | 8.2 | 41.8 | 74.2 | 25.4 |
| 25-Nov-88 | 1.7 | 2.630 | 654 | 63.2 | 7.2 | 19.5 | 6.2 | 19.5 | 6.2 | 31.2 | 55.5 | 31.0 |
| 26-Nov-88 | 1.3 | 2.011 | 472 | 59.7 | 6.9 | 19.6 | 6.2 | 19.6 | 6.2 | 31.4 | 55.8 | 36.1 |
| 27-Nov-88 | 1.9 | 2.940 | 482 | 42.0 | 5.1 | 13.6 | 4.3 | 13.6 | 4.3 | 21.9 | 38.9 | 31.6 |
| 28-Nov-88 | 1.3 | 2.011 | 750 | 94.2 | 10.3 | 28.4 | 9.0 | 28.4 | 9.0 | 45.5 | 80.9 | 32.5 |
| 29-Nov-88 | 1.3 | 2.011 | 712 | 89.5 | 9.8 | 27.2 | 8.6 | 27.2 | 8.6 | 43.7 | 77.6 | 35.6 |
| 30-Nov-88 | 1.1 | 1.702 | 745 | 110.4 | 11.9 | 33.3 | 10.5 | 33.3 | 10.5 | 53.5 | 95.0 | 41.1 |
| 01-Dec-88 | 1.1 | 1.702 | 230 | 34.8 | 4.4 | 13.0 | 4.1 | 13.0 | 4.1 | 20.9 | 37.1 | 40.9 |
| 02-Dec-88 | 1.1 | 1.702 | 228 | 34.5 | 4.3 | 12.9 | 4.1 | 12.9 | 4.1 | 20.8 | 36.8 | 34.7 |
| 03-Dec-88 | 0.8 | 1.238 | 164 | 34.1 | 4.3 | 13.6 | 4.3 | 13.6 | 4.3 | 21.9 | 38.9 | 29.3 |
| 04-Dec-88 | 0.6 | 0.928 | 159 | 43.8 | 5.3 | 17.7 | 5.6 | 17.7 | 5.3 | 28.4 | 47.6 | 23.0 |
| 05-Dec-88 | 1.1 | 1.702 | 340 | 50.9 | 6.0 | 17.8 | 5.6 | 17.8 | 5.6 | 28.5 | 50.7 | 24.9 |
| 06-Dec-88 | 1.1 | 1.702 | 1240 | 183.1 | 19.2 | 50.2 | 15.9 | 50.2 | 15.9 | 80.5 | 143.0 | 39.8 |
| 07-Dec-88 | 1.1 | 1.702 | 1340 | 197.8 | 20.7 | 53.5 | 16.9 | 53.5 | 16.9 | 85.6 | 152.2 | 55.8 |
| 08-Dec-88 | 1.1 | 1.702 | 548 | 81.5 | 9.0 | 26.1 | 8.2 | 26.1 | 8.2 | 41.8 | 74.3 | 59.1 |
| 09-Dec-88 | 1.1 | 1.702 | 336 | 50.4 | 5.9 | 17.6 | 5.6 | 17.6 | 5.6 | 28.3 | 50.2 | 59.0 |
| 10-Dec-88 | 0.9 | 1.392 | 308 | 56.3 | 6.5 | 20.1 | 6.3 | 20.1 | 6.3 | 32.2 | 57.2 | 47.0 |
| 11-Dec-88 | 1.1 | 1.702 | 229 | 34.6 | 4.4 | 13.0 | 4.1 | 13.0 | 4.1 | 20.8 | 37.0 | 30.8 |
| 12-Dec-88 | 1.5 | 2.321 | 226 | 25.3 | 3.4 | 9.4 | 3.0 | 9.4 | 3.0 | 15.2 | 26.9 | 24.1 |
| 13-Dec-88 | 1.5 | 2.321 | 473 | 52.0 | 6.1 | 17.0 | 5.4 | 17.0 | 5.4 | 27.3 | 48.5 | 23.9 |
| 14-Dec-88 | 1.3 | 2.011 | 677 | 85.1 | 9.4 | 26.1 | 8.3 | 26.1 | 8.3 | 41.9 | 74.5 | 26.3 |
| 15-Dec-88 | 1.4 | 2.166 | 346 | 40.9 | 5.0 | 14.2 | 4.5 | 14.2 | 4.5 | 22.8 | 40.4 | 26.8 |
| 16-Dec-88 | 1 | 1.547 | 225 | 37.4 | 4.6 | 14.0 | 4.4 | 14.0 | 4.4 | 22.6 | 40.1 | 28.6 |
| 17-Dec-88 | 1 | 1.547 | 183 | 30.6 | 4.0 | 11.9 | 3.8 | 11.9 | 3.8 | 19.2 | 34.0 | 26.6 |
| 18-Dec-88 | 1.4 | 2.166 | 173 | 21.0 | 3.0 | 8.2 | 2.6 | 8.2 | 2.6 | 13.1 | 23.3 | 19.4 |
| 19-Dec-88 | 1.6 | 2.476 | 179 | 19.1 | 2.8 | 7.3 | 2.3 | 7.3 | 2.3 | 11.8 | 21.0 | 16.7 |
| 20-Dec-88 | 1.4 | 2.166 | 185 | 22.4 | 3.1 | 8.6 | 2.7 | 8.6 | 2.7 | 13.9 | 24.6 | 14.5 |
| 21-Dec-88 | 1.2 | 1.857 | 182 | 25.5 | 3.5 | 9.9 | 3.1 | 9.9 | 3.1 | 15.9 | 28.3 | 13.7 |
| 22-Dec-88 | 1.3 | 2.011 | 176 | 22.9 | 3.2 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.4 | 14.0 |
| 23-Dec-88 | 1.2 | 1.857 | 173 | 24.3 | 3.3 | 9.5 | 3.0 | 9.5 | 3.0 | 15.3 | 27.1 | 14.9 |
| 24-Dec-88 | 1.1 | 1.702 | 171 | 26.1 | 3.5 | 10.3 | 3.2 | 10.3 | 3.2 | 16.5 | 29.3 | 15.5 |
| 25-Dec-88 | 1 | 1.547 | 167 | 28.0 | 3.7 | 11.1 | 3.5 | 11.1 | 3.5 | 17.8 | 31.6 | 16.0 |
| 26-Dec-88 | 1.1 | 1.702 | 164 | 25.1 | 3.4 | 9.9 | 3.1 | 9.9 | 3.1 | 16.0 | 28.3 | 16.4 |
| 27-Dec-88 | 1 | 1.547 | 166 | 27.8 | 3.7 | 11.0 | 3.5 | 11.0 | 3.5 | 17.7 | 31.5 | 17.0 |
| 28-Dec-88 | 1 | 1.547 | 161 | 27.0 | 3.6 | 10.8 | 3.4 | 10.8 | 3.4 | 17.3 | 30.7 | 17.2 |
| 29-Dec-88 | 3.4 | 5.260 | 168 | 9.0 | 1.8 | 3.3 | 1.1 | 3.3 | 1.1 | 5.4 | 9.6 | 14.1 |
| 30-Dec-88 | 2.7 | 4.177 | 452 | 28.1 | 3.7 | 9.1 | 2.9 | 9.1 | 2.9 | 14.7 | 26.1 | 13.8 |
| 31-Dec-88 | 2.2 | 3.404 | 580 | 43.6 | 5.3 | 13.7 | 4.3 | 13.7 | 4.3 | 22.0 | 39.0 | 14.9 |
| 01-Jan-89 | 1.8 | 2.785 | 352 | 32.6 | 4.2 | 11.2 | 3.5 | 11.2 | 3.5 | 18.0 | 32.0 | 15.0 |
| 02-Jan-89 | 2 | 3.094 | 286 | 24.1 | 3.3 | 8.5 | 2.7 | 8.5 | 2.7 | 13.8 | 24.4 | 17.1 |
| 03-Jan-89 | 2.3 | 3.559 | 273 | 20.2 | 2.9 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.5 | 16.3 |
| 04-Jan-89 | 2.4 | 3.713 | 561 | 38.8 | 4.8 | 12.2 | 3.9 | 12.2 | 3.9 | 19.6 | 34.8 | 15.7 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mgN/L, WLA=WQS*DF-Ca*(DF-1) | | WLA Running Averages for 4-day Averaging Period |
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs): | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mgN/L) | Acute (mgN/L) | Chronic (mgN/L) |
| 05-Jan-89 | 3 | 4.642 | 759 | 41.9 | 5.1 | 12.5 | 3.9 | 12.5 | 3.9 | 20.0 | 35.5 | 16.2 |
| 06-Jan-89 | 2.4 | 3.713 | 550 | 38.0 | 4.7 | 12.0 | 3.8 | 12.0 | 3.8 | 19.3 | 34.3 | 17.6 |
| 07-Jan-89 | 1.8 | 2.785 | 367 | 33.9 | 4.3 | 11.6 | 3.7 | 11.6 | 3.7 | 18.6 | 33.0 | 19.4 |
| 08-Jan-89 | 3.1 | 4.796 | 314 | 17.4 | 2.6 | 6.0 | 1.9 | 6.0 | 1.9 | 9.6 | 17.1 | 16.9 |
| 09-Jan-89 | 3.6 | 5.570 | 564 | 26.3 | 3.5 | 8.2 | 2.6 | 8.2 | 2.6 | 13.2 | 23.4 | 15.2 |
| 10-Jan-89 | 2.3 | 3.559 | 1010 | 72.0 | 8.1 | 20.4 | 6.5 | 20.4 | 6.5 | 32.7 | 58.2 | 18.6 |
| 11-Jan-89 | 1.8 | 2.785 | 534 | 48.9 | 5.8 | 15.6 | 4.9 | 15.6 | 4.9 | 25.1 | 44.6 | 20.2 |
| 12-Jan-89 | 1.8 | 2.785 | 325 | 30.2 | 3.9 | 10.5 | 3.3 | 10.5 | 3.3 | 16.9 | 30.0 | 22.0 |
| 13-Jan-89 | 2 | 3.094 | 304 | 25.6 | 3.5 | 9.0 | 2.8 | 9.0 | 2.8 | 14.5 | 25.6 | 22.3 |
| 14-Jan-89 | 1.8 | 2.785 | 279 | 26.0 | 3.5 | 9.3 | 2.9 | 9.3 | 2.9 | 15.0 | 26.6 | 17.9 |
| 15-Jan-89 | 1.9 | 2.940 | 258 | 22.9 | 3.2 | 8.3 | 2.6 | 8.3 | 2.6 | 13.4 | 23.7 | 14.9 |
| 16-Jan-89 | 2.4 | 3.713 | 313 | 22.1 | 3.1 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 21.9 | 13.8 |
| 17-Jan-89 | 1.9 | 2.940 | 629 | 54.5 | 6.3 | 16.9 | 5.3 | 16.9 | 5.3 | 27.1 | 48.1 | 17.0 |
| 18-Jan-89 | 2.3 | 3.559 | 977 | 69.6 | 7.9 | 19.9 | 6.3 | 19.9 | 6.3 | 31.9 | 56.6 | 21.2 |
| 19-Jan-89 | 1.8 | 2.785 | 1710 | 154.5 | 16.4 | 39.8 | 12.6 | 39.8 | 12.6 | 63.7 | 113.3 | 33.8 |
| 20-Jan-89 | 1.9 | 2.940 | 1950 | 166.8 | 17.6 | 41.9 | 13.2 | 41.9 | 13.2 | 67.1 | 119.2 | 47.4 |
| 21-Jan-89 | 1.7 | 2.630 | 1750 | 167.3 | 17.6 | 42.9 | 13.6 | 42.9 | 13.6 | 68.7 | 122.2 | 57.8 |
| 22-Jan-89 | 1.7 | 2.630 | 1570 | 150.2 | 15.9 | 39.3 | 12.4 | 39.3 | 12.4 | 63.0 | 112.0 | 65.6 |
| 23-Jan-89 | 1.6 | 2.476 | 1360 | 138.3 | 14.7 | 37.2 | 11.8 | 37.2 | 11.8 | 59.6 | 106.0 | 64.6 |
| 24-Jan-89 | 1.4 | 2.166 | 1240 | 144.1 | 15.3 | 39.5 | 12.5 | 39.5 | 12.5 | 63.3 | 112.4 | 63.6 |
| 25-Jan-89 | 1.4 | 2.166 | 1160 | 134.9 | 14.4 | 37.4 | 11.8 | 37.4 | 11.8 | 60.0 | 106.6 | 61.5 |
| 26-Jan-89 | 1.5 | 2.321 | 1090 | 118.4 | 12.7 | 33.2 | 10.5 | 33.2 | 10.5 | 53.2 | 94.6 | 59.0 |
| 27-Jan-89 | 1.5 | 2.321 | 1110 | 120.6 | 13.0 | 33.7 | 10.7 | 33.7 | 10.7 | 54.0 | 96.0 | 57.6 |
| 28-Jan-89 | 1.3 | 2.011 | 1040 | 130.3 | 13.9 | 36.9 | 11.7 | 36.9 | 11.7 | 59.1 | 105.1 | 56.6 |
| 29-Jan-89 | 1.2 | 1.857 | 1030 | 139.7 | 14.9 | 39.7 | 12.5 | 39.7 | 12.5 | 63.6 | 113.0 | 57.5 |
| 30-Jan-89 | 1.9 | 2.940 | 1560 | 133.7 | 14.3 | 35.0 | 11.1 | 35.0 | 11.1 | 56.1 | 99.7 | 58.2 |
| 31-Jan-89 | 1.8 | 2.785 | 2340 | 211.1 | 22.0 | 51.2 | 16.2 | 51.2 | 16.2 | 82.0 | 145.7 | 65.2 |
| 01-Feb-89 | 1.7 | 2.630 | 2260 | 215.8 | 22.5 | 52.7 | 16.7 | 52.7 | 16.7 | 84.4 | 150.0 | 71.5 |
| 02-Feb-89 | 1.8 | 2.785 | 1470 | 133.0 | 14.2 | 35.2 | 11.1 | 35.2 | 11.1 | 56.4 | 100.3 | 69.7 |
| 03-Feb-89 | 1.7 | 2.630 | 1200 | 115.1 | 12.4 | 31.7 | 10.0 | 31.7 | 10.0 | 50.8 | 90.2 | 68.4 |
| 04-Feb-89 | 1.6 | 2.476 | 1140 | 116.1 | 12.5 | 32.3 | 10.2 | 32.3 | 10.2 | 51.8 | 92.0 | 60.8 |
| 05-Feb-89 | 1.4 | 2.166 | 1090 | 126.8 | 13.6 | 35.6 | 11.3 | 35.6 | 11.3 | 57.0 | 101.4 | 54.0 |
| 06-Feb-89 | 1.6 | 2.476 | 1060 | 108.0 | 11.7 | 30.5 | 9.6 | 30.5 | 9.6 | 48.8 | 86.8 | 52.1 |
| 07-Feb-89 | 1 | 1.547 | 998 | 162.3 | 17.1 | 46.4 | 14.7 | 46.4 | 14.7 | 74.3 | 132.1 | 58.0 |
| 08-Feb-89 | 1.1 | 1.702 | 902 | 133.5 | 14.2 | 38.9 | 12.3 | 38.9 | 12.3 | 62.3 | 110.8 | 60.6 |
| 09-Feb-89 | 1.2 | 1.857 | 854 | 116.0 | 12.5 | 34.1 | 10.8 | 34.1 | 10.8 | 54.7 | 97.2 | 60.0 |
| 10-Feb-89 | 1 | 1.547 | 825 | 134.3 | 14.3 | 39.8 | 12.6 | 39.8 | 12.6 | 63.8 | 113.4 | 63.8 |
| 11-Feb-89 | 0.7 | 1.083 | 800 | 185.7 | 19.5 | 55.5 | 17.5 | 55.5 | 17.5 | 88.8 | 157.9 | 67.4 |
| 12-Feb-89 | 1 | 1.547 | 783 | 127.5 | 13.7 | 38.2 | 12.1 | 38.2 | 12.1 | 61.2 | 108.7 | 67.1 |
| 13-Feb-89 | 0.9 | 1.392 | 711 | 128.6 | 13.8 | 39.2 | 12.4 | 39.2 | 12.4 | 62.9 | 111.8 | 69.2 |
| 14-Feb-89 | 0.9 | 1.392 | 635 | 115.0 | 12.4 | 35.8 | 11.3 | 35.8 | 11.3 | 57.4 | 102.1 | 67.6 |
| 15-Feb-89 | 1 | 1.547 | 694 | 113.1 | 12.2 | 34.6 | 11.0 | 34.6 | 11.0 | 55.5 | 98.7 | 59.3 |
| 16-Feb-89 | 1.3 | 2.011 | 697 | 87.6 | 9.7 | 26.8 | 8.5 | 26.8 | 8.5 | 42.9 | 76.3 | 54.7 |
| 17-Feb-89 | 1.7 | 2.630 | 725 | 69.9 | 7.9 | 21.1 | 6.7 | 21.1 | 6.7 | 33.9 | 60.2 | 47.5 |
| 18-Feb-89 | 1.8 | 2.785 | 757 | 69.0 | 7.8 | 20.7 | 6.5 | 20.7 | 6.5 | 33.2 | 58.9 | 41.4 |
| 19-Feb-89 | 1.8 | 2.785 | 761 | 69.3 | 7.8 | 20.8 | 6.6 | 20.8 | 6.6 | 33.3 | 59.2 | 35.8 |
| 20-Feb-89 | 1.8 | 2.785 | 763 | 69.5 | 7.8 | 20.8 | 6.6 | 20.8 | 6.6 | 33.4 | 59.3 | 33.4 |
| 21-Feb-89 | 1.6 | 2.476 | 776 | 79.4 | 8.8 | 23.7 | 7.5 | 23.7 | 7.5 | 38.0 | 67.6 | 34.5 |
| 22-Feb-89 | 1.9 | 2.940 | 821 | 70.8 | 8.0 | 20.9 | 6.6 | 20.9 | 6.6 | 33.5 | 59.6 | 34.6 |
| 23-Feb-89 | 1.7 | 2.630 | 917 | 88.2 | 9.7 | 25.5 | 8.1 | 25.5 | 8.1 | 40.9 | 72.7 | 36.5 |
| 24-Feb-89 | 1.5 | 2.321 | 889 | 96.8 | 10.6 | 28.2 | 8.9 | 28.2 | 8.9 | 45.2 | 80.4 | 39.4 |
| 25-Feb-89 | 1.8 | 2.785 | 851 | 77.4 | 8.6 | 22.7 | 7.2 | 22.7 | 7.2 | 36.4 | 64.7 | 39.0 |
| 26-Feb-89 | 1.6 | 2.476 | 838 | 85.6 | 9.5 | 25.2 | 8.0 | 25.2 | 8.0 | 40.4 | 71.9 | 40.8 |
| 27-Feb-89 | 1.5 | 2.321 | 804 | 87.6 | 9.7 | 26.0 | 8.2 | 26.0 | 8.2 | 41.7 | 74.1 | 41.0 |
| 28-Feb-89 | 1.4 | 2.166 | 796 | 92.9 | 10.2 | 27.6 | 8.7 | 27.6 | 8.7 | 44.3 | 78.8 | 40.7 |
| 01-Mar-89 | 1.6 | 2.476 | 788 | 80.6 | 9.0 | 24.0 | 7.6 | 24.0 | 7.6 | 38.5 | 68.4 | 41.3 |
| 02-Mar-89 | 1.7 | 2.630 | 771 | 74.3 | 8.3 | 22.2 | 7.0 | 22.2 | 7.0 | 35.6 | 63.3 | 40.0 |
| 03-Mar-89 | 1.6 | 2.476 | 723 | 74.0 | 8.3 | 22.4 | 7.1 | 22.4 | 7.1 | 35.9 | 63.9 | 38.6 |
| 04-Mar-89 | 1.6 | 2.476 | 694 | 71.1 | 8.0 | 21.7 | 6.9 | 21.7 | 6.9 | 34.8 | 61.8 | 36.2 |
| 05-Mar-89 | 3.1 | 4.796 | 714 | 38.2 | 4.7 | 11.5 | 3.6 | 11.5 | 3.6 | 18.5 | 32.8 | 31.2 |
| 06-Mar-89 | 2.8 | 4.332 | 1100 | 64.5 | 7.3 | 18.0 | 5.7 | 18.0 | 5.7 | 28.8 | 51.2 | 29.5 |
| 07-Mar-89 | 2.2 | 3.404 | 1310 | 97.2 | 10.6 | 26.3 | 8.3 | 26.3 | 8.3 | 42.1 | 74.9 | 31.1 |
| 08-Mar-89 | 1.7 | 2.630 | 1130 | 108.4 | 11.7 | 30.2 | 9.5 | 30.2 | 9.5 | 48.4 | 86.0 | 34.5 |
| 09-Mar-89 | 1.6 | 2.476 | 1060 | 108.0 | 11.7 | 30.5 | 9.6 | 30.5 | 9.6 | 48.8 | 86.8 | 42.0 |
| 10-Mar-89 | 1.7 | 2.630 | 1230 | 117.9 | 12.7 | 32.3 | 10.2 | 32.3 | 10.2 | 51.8 | 92.0 | 47.8 |
| 11-Mar-89 | 1.9 | 2.940 | 1500 | 128.6 | 13.8 | 33.9 | 10.7 | 33.9 | 10.7 | 54.3 | 96.6 | 50.8 |
| 12-Mar-89 | 2.7 | 4.177 | 1940 | 117.1 | 12.6 | 29.4 | 9.3 | 29.4 | 9.3 | 47.1 | 83.6 | 50.5 |
| 13-Mar-89 | 2.5 | 3.868 | 1960 | 127.7 | 13.7 | 32.0 | 10.1 | 32.0 | 10.1 | 51.2 | 91.1 | 51.1 |
| 14-Mar-89 | 2.1 | 3.249 | 1720 | 133.3 | 14.2 | 34.2 | 10.8 | 34.2 | 10.8 | 54.9 | 97.6 | 51.9 |
| 15-Mar-89 | 2.1 | 3.249 | 1510 | 117.2 | 12.6 | 30.8 | 9.8 | 30.8 | 9.8 | 49.5 | 87.9 | 50.7 |
| 16-Mar-89 | 3.3 | 5.106 | 1480 | 73.5 | 8.2 | 19.3 | 6.1 | 19.3 | 6.1 | 31.0 | 55.1 | 46.7 |
| 17-Mar-89 | 2.1 | 3.249 | 1210 | 94.1 | 10.3 | 25.8 | 8.2 | 25.8 | 8.2 | 41.4 | 73.6 | 44.2 |
| 18-Mar-89 | 2.1 | 3.249 | 1040 | 81.0 | 9.0 | 22.9 | 7.2 | 22.9 | 7.2 | 36.7 | 65.2 | 39.6 |
| 19-Mar-89 | 1.8 | 2.785 | 1010 | 91.7 | 10.1 | 26.0 | 8.2 | 26.0 | 8.2 | 41.8 | 74.2 | 37.7 |
| 20-Mar-89 | 2 | 3.094 | 1020 | 83.4 | 9.2 | 23.6 | 7.5 | 23.6 | 7.5 | 37.9 | 67.4 | 39.4 |
| 21-Mar-89 | 1.9 | 2.940 | 865 | 74.6 | 8.4 | 21.8 | 6.9 | 21.8 | 6.9 | 35.0 | 62.1 | 37.8 |
| 22-Mar-89 | 1.5 | 2.321 | 725 | 79.1 | 8.8 | 23.9 | 7.6 | 23.9 | 7.6 | 38.4 | 68.2 | 38.3 |
| 23-Mar-89 | 1.1 | 1.702 | 518 | 77.1 | 8.6 | 24.9 | 7.9 | 24.9 | 7.9 | 40.0 | 71.0 | 37.8 |
| 24-Mar-89 | 1.4 | 2.166 | 406 | 47.9 | 5.7 | 16.1 | 5.1 | 16.1 | 5.1 | 25.9 | 46.0 | 34.8 |
| 25-Mar-89 | 2 | 3.094 | 555 | 45.8 | 5.5 | 14.5 | 4.6 | 14.5 | 4.6 | 23.3 | 41.4 | 31.9 |
| 26-Mar-89 | 1.6 | 2.476 | 659 | 67.6 | 7.7 | 20.8 | 6.6 | 20.8 | 6.6 | 33.4 | 59.3 | 30.6 |
| 27-Mar-89 | 2.4 | 3.713 | 639 | 44.0 | 5.3 | 13.5 | 4.3 | 13.5 | 4.3 | 21.8 | 38.7 | 26.1 |
| 28-Mar-89 | 2.4 | 3.713 | 503 | 34.9 | 4.4 | 11.2 | 3.5 | 11.2 | 3.5 | 18.0 | 31.9 | 24.1 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mg/L, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs) | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mg/L) | Acute (mg/L) | Chronic (mg/L) |
| 29-Mar-89 | 1.8 | 2.785 | 476 | 43.7 | 5.3 | 14.3 | 4.5 | 14.3 | 4.5 | 22.9 | 40.7 | 24.0 |
| 30-Mar-89 | 1.8 | 2.785 | 567 | 51.9 | 6.1 | 16.4 | 5.2 | 16.4 | 5.2 | 26.3 | 46.8 | 22.3 |
| 31-Mar-89 | 1.7 | 2.630 | 867 | 83.4 | 9.2 | 24.4 | 7.7 | 24.4 | 7.7 | 39.1 | 69.5 | 26.6 |
| 01-Apr-89 | 2 | 3.094 | 667 | 54.9 | 6.4 | 16.8 | 5.3 | 16.8 | 5.3 | 27.0 | 47.9 | 28.8 |
| 02-Apr-89 | 2.4 | 3.713 | 539 | 37.3 | 4.6 | 11.8 | 3.7 | 11.8 | 3.7 | 19.0 | 33.7 | 27.9 |
| 03-Apr-89 | 2.1 | 3.249 | 384 | 30.5 | 4.0 | 10.3 | 3.3 | 10.3 | 3.3 | 16.6 | 29.4 | 25.4 |
| 04-Apr-89 | 2.7 | 4.177 | 385 | 24.0 | 3.3 | 8.0 | 2.5 | 8.0 | 2.5 | 13.0 | 23.0 | 18.9 |
| 05-Apr-89 | 3.6 | 5.570 | 1070 | 49.0 | 5.8 | 13.7 | 4.3 | 13.7 | 4.3 | 22.0 | 39.0 | 17.6 |
| 06-Apr-89 | 2.4 | 3.713 | 2270 | 153.8 | 16.3 | 37.5 | 11.8 | 37.5 | 11.8 | 60.0 | 106.7 | 27.9 |
| 07-Apr-89 | 1.8 | 2.785 | 2990 | 269.4 | 27.8 | 62.3 | 19.7 | 62.3 | 19.7 | 99.8 | 177.4 | 48.7 |
| 08-Apr-89 | 1.4 | 2.166 | 2170 | 251.5 | 26.0 | 61.9 | 19.6 | 61.9 | 19.6 | 99.1 | 176.3 | 70.2 |
| 09-Apr-89 | 1.2 | 1.857 | 1730 | 233.9 | 24.3 | 60.2 | 19.0 | 60.2 | 19.0 | 96.4 | 171.4 | 88.8 |
| 10-Apr-89 | 1.2 | 1.857 | 1500 | 203.0 | 21.2 | 53.7 | 17.0 | 53.7 | 17.0 | 85.9 | 152.8 | 95.3 |
| 11-Apr-89 | 1 | 1.547 | 1290 | 209.4 | 21.8 | 57.0 | 18.0 | 57.0 | 18.0 | 91.3 | 162.4 | 93.2 |
| 12-Apr-89 | 1 | 1.547 | 1250 | 203.0 | 21.2 | 55.6 | 17.6 | 55.6 | 17.6 | 89.1 | 158.3 | 90.7 |
| 13-Apr-89 | 1 | 1.547 | 1230 | 199.7 | 20.9 | 54.9 | 17.4 | 54.9 | 17.4 | 87.9 | 156.3 | 88.6 |
| 14-Apr-89 | 1 | 1.547 | 1410 | 228.8 | 23.8 | 61.2 | 19.4 | 61.2 | 19.4 | 98.1 | 174.4 | 91.6 |
| 15-Apr-89 | 0.9 | 1.392 | 1620 | 291.8 | 30.1 | 76.1 | 24.1 | 76.1 | 24.1 | 121.8 | 216.6 | 99.2 |
| 16-Apr-89 | 0.9 | 1.392 | 1730 | 311.6 | 32.1 | 80.2 | 25.4 | 80.2 | 25.4 | 128.4 | 228.4 | 109.1 |
| 17-Apr-89 | 0.9 | 1.392 | 1670 | 300.8 | 31.0 | 78.0 | 24.7 | 78.0 | 24.7 | 124.8 | 222.0 | 118.3 |
| 18-Apr-89 | 0.9 | 1.392 | 1520 | 273.9 | 28.3 | 72.3 | 22.9 | 72.3 | 22.9 | 115.8 | 205.8 | 122.7 |
| 19-Apr-89 | 0.8 | 1.238 | 1380 | 279.7 | 28.9 | 75.2 | 23.8 | 75.2 | 23.8 | 120.5 | 214.2 | 122.4 |
| 20-Apr-89 | 1 | 1.547 | 1430 | 232.1 | 24.1 | 61.9 | 19.6 | 61.9 | 19.6 | 99.2 | 176.4 | 115.1 |
| 21-Apr-89 | 0.9 | 1.392 | 1560 | 281.1 | 29.0 | 73.8 | 23.3 | 73.8 | 23.3 | 118.2 | 210.2 | 113.4 |
| 22-Apr-89 | 0.8 | 1.238 | 1490 | 301.9 | 31.1 | 80.0 | 25.3 | 80.0 | 25.3 | 128.1 | 227.8 | 116.5 |
| 23-Apr-89 | 0.9 | 1.392 | 1280 | 230.8 | 24.0 | 63.0 | 19.9 | 63.0 | 19.9 | 100.8 | 179.3 | 111.6 |
| 24-Apr-89 | 0.9 | 1.392 | 928 | 167.6 | 17.7 | 48.6 | 15.4 | 48.6 | 15.4 | 77.9 | 138.5 | 106.3 |
| 25-Apr-89 | 0.9 | 1.392 | 488 | 88.6 | 9.8 | 29.0 | 9.2 | 29.0 | 9.2 | 46.5 | 82.7 | 88.3 |
| 26-Apr-89 | 0.9 | 1.392 | 287 | 52.5 | 6.2 | 19.0 | 6.0 | 19.0 | 6.0 | 30.4 | 54.0 | 63.9 |
| 27-Apr-89 | 0.8 | 1.238 | 219 | 45.2 | 5.4 | 17.2 | 5.4 | 17.2 | 5.4 | 27.6 | 48.9 | 45.6 |
| 28-Apr-89 | 0.8 | 1.238 | 217 | 44.8 | 5.4 | 17.0 | 5.4 | 17.0 | 5.4 | 27.4 | 48.5 | 33.0 |
| 29-Apr-89 | 0.6 | 0.928 | 206 | 56.5 | 6.5 | 21.8 | 6.9 | 21.8 | 6.5 | 34.9 | 59.0 | 30.1 |
| 30-Apr-89 | 0.7 | 1.083 | 209 | 49.2 | 5.8 | 18.9 | 6.0 | 18.9 | 5.8 | 30.3 | 52.5 | 30.0 |
| 01-Nov-89 | 0.6 | 0.928 | 125 | 34.7 | 4.4 | 14.6 | 4.6 | 14.6 | 4.4 | 23.4 | 39.4 | |
| 02-Nov-89 | 0.6 | 0.928 | 129 | 35.7 | 4.5 | 15.0 | 4.7 | 15.0 | 4.5 | 24.0 | 40.4 | |
| 03-Nov-89 | 0.8 | 1.238 | 127 | 26.7 | 3.6 | 11.1 | 3.5 | 11.1 | 3.5 | 17.9 | 31.7 | |
| 04-Nov-89 | 0.8 | 1.238 | 135 | 28.3 | 3.7 | 11.7 | 3.7 | 11.7 | 3.7 | 18.8 | 33.3 | 21.0 |
| 05-Nov-89 | 0.7 | 1.083 | 128 | 30.5 | 4.0 | 12.8 | 4.0 | 12.8 | 4.0 | 20.5 | 35.7 | 20.3 |
| 06-Nov-89 | 0.8 | 1.238 | 127 | 26.7 | 3.6 | 11.1 | 3.5 | 11.1 | 3.5 | 17.9 | 31.7 | 18.7 |
| 07-Nov-89 | 0.7 | 1.083 | 123 | 29.4 | 3.8 | 12.4 | 3.9 | 12.4 | 3.8 | 19.9 | 34.7 | 19.2 |
| 08-Nov-89 | 0.9 | 1.392 | 124 | 23.3 | 3.2 | 9.7 | 3.1 | 9.7 | 3.1 | 15.6 | 27.7 | 18.5 |
| 09-Nov-89 | 1.1 | 1.702 | 1550 | 228.7 | 23.8 | 60.1 | 19.0 | 60.1 | 19.0 | 96.2 | 171.1 | 37.4 |
| 10-Nov-89 | 1.8 | 2.785 | 1450 | 131.2 | 14.0 | 34.8 | 11.0 | 34.8 | 11.0 | 55.8 | 99.2 | 46.9 |
| 11-Nov-89 | 3.6 | 5.570 | 1540 | 70.1 | 7.9 | 18.3 | 5.8 | 18.3 | 5.8 | 29.4 | 52.2 | 49.3 |
| 12-Nov-89 | 2.4 | 3.713 | 2200 | 149.1 | 15.8 | 36.5 | 11.6 | 36.5 | 11.6 | 58.5 | 104.1 | 60.0 |
| 13-Nov-89 | 1.5 | 2.321 | 1180 | 128.1 | 13.7 | 35.4 | 11.2 | 35.4 | 11.2 | 56.7 | 100.9 | 50.1 |
| 14-Nov-89 | 1 | 1.547 | 956 | 155.5 | 16.4 | 44.8 | 14.2 | 44.8 | 14.2 | 71.8 | 127.6 | 54.1 |
| 15-Nov-89 | 0.9 | 1.392 | 276 | 50.6 | 6.0 | 18.4 | 5.8 | 18.4 | 5.8 | 29.5 | 52.4 | 54.1 |
| 16-Nov-89 | 1.5 | 2.321 | 169 | 19.2 | 2.8 | 7.5 | 2.4 | 7.5 | 2.4 | 12.1 | 21.4 | 42.5 |
| 17-Nov-89 | 1.2 | 1.857 | 486 | 66.4 | 7.5 | 21.7 | 6.9 | 21.7 | 6.9 | 34.8 | 61.9 | 37.0 |
| 18-Nov-89 | 1 | 1.547 | 210 | 34.9 | 4.4 | 13.3 | 4.2 | 13.3 | 4.2 | 21.4 | 37.9 | 24.4 |
| 19-Nov-89 | 1 | 1.547 | 153 | 25.7 | 3.5 | 10.3 | 3.3 | 10.3 | 3.3 | 16.6 | 29.5 | 21.2 |
| 20-Nov-89 | 1 | 1.547 | 140 | 23.6 | 3.3 | 9.6 | 3.0 | 9.6 | 3.0 | 15.5 | 27.5 | 22.1 |
| 21-Nov-89 | 0.9 | 1.392 | 130 | 24.3 | 3.3 | 10.1 | 3.2 | 10.1 | 3.2 | 16.2 | 28.7 | 17.4 |
| 22-Nov-89 | 1 | 1.547 | 122 | 20.7 | 3.0 | 8.6 | 2.7 | 8.6 | 2.7 | 13.9 | 24.6 | 15.5 |
| 23-Nov-89 | 1.5 | 2.321 | 132 | 15.2 | 2.4 | 6.1 | 1.9 | 6.1 | 1.9 | 9.9 | 17.6 | 13.9 |
| 24-Nov-89 | 1.7 | 2.630 | 149 | 15.2 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.7 | 17.1 | 12.4 |
| 25-Nov-89 | 1.5 | 2.321 | 651 | 71.1 | 8.0 | 22.0 | 6.9 | 22.0 | 6.9 | 35.2 | 62.6 | 17.2 |
| 26-Nov-89 | 1.4 | 2.166 | 694 | 81.1 | 9.0 | 24.8 | 7.8 | 24.8 | 7.8 | 39.7 | 70.6 | 23.6 |
| 27-Nov-89 | 1 | 1.547 | 137 | 23.1 | 3.2 | 9.5 | 3.0 | 9.5 | 3.0 | 15.2 | 27.0 | 25.0 |
| 28-Nov-89 | 1 | 1.547 | 120 | 20.4 | 2.9 | 8.5 | 2.7 | 8.5 | 2.7 | 13.7 | 24.3 | 26.0 |
| 29-Nov-89 | 0.9 | 1.392 | 121 | 22.7 | 3.2 | 9.5 | 3.0 | 9.5 | 3.0 | 15.3 | 27.2 | 21.0 |
| 30-Nov-89 | 0.9 | 1.392 | 120 | 22.5 | 3.2 | 9.4 | 3.0 | 9.4 | 3.0 | 15.2 | 27.0 | 14.9 |
| 01-Dec-89 | 0.9 | 1.392 | 133 | 24.9 | 3.4 | 10.2 | 3.2 | 10.2 | 3.2 | 16.5 | 29.3 | 15.2 |
| 02-Dec-89 | 1.1 | 1.702 | 125 | 19.4 | 2.8 | 8.0 | 2.5 | 8.0 | 2.5 | 12.9 | 22.9 | 15.0 |
| 03-Dec-89 | 2.9 | 4.487 | 174 | 10.7 | 2.0 | 4.0 | 1.3 | 4.0 | 1.3 | 6.5 | 11.5 | 12.8 |
| 04-Dec-89 | 5.4 | 8.355 | 3150 | 95.3 | 10.4 | 21.7 | 6.9 | 21.7 | 6.9 | 34.8 | 61.8 | 17.7 |
| 05-Dec-89 | 2.5 | 3.868 | 5740 | 372.0 | 38.1 | 75.8 | 24.0 | 75.8 | 24.0 | 121.4 | 215.9 | 43.9 |
| 06-Dec-89 | 1.7 | 2.630 | 2870 | 273.8 | 28.3 | 63.8 | 20.2 | 63.8 | 20.2 | 102.2 | 181.8 | 66.2 |
| 07-Dec-89 | 2 | 3.094 | 2150 | 174.7 | 18.4 | 43.0 | 13.6 | 43.0 | 13.6 | 68.9 | 122.5 | 81.8 |
| 08-Dec-89 | 2.1 | 3.249 | 2100 | 162.6 | 17.2 | 40.2 | 12.7 | 40.2 | 12.7 | 64.4 | 114.5 | 89.3 |
| 09-Dec-89 | 1.3 | 2.011 | 2040 | 254.6 | 26.4 | 63.4 | 20.1 | 63.4 | 20.1 | 101.6 | 180.6 | 84.3 |
| 10-Dec-89 | 1.2 | 1.857 | 1760 | 238.0 | 24.7 | 61.0 | 19.3 | 61.0 | 19.3 | 97.7 | 173.7 | 83.2 |
| 11-Dec-89 | 1 | 1.547 | 1590 | 257.9 | 26.7 | 67.5 | 21.3 | 67.5 | 21.3 | 108.0 | 192.1 | 92.9 |
| 12-Dec-89 | 1 | 1.547 | 1480 | 240.1 | 24.9 | 63.7 | 20.1 | 63.7 | 20.1 | 102.0 | 181.3 | 102.3 |
| 13-Dec-89 | 0.9 | 1.392 | 572 | 103.7 | 11.3 | 33.0 | 10.4 | 33.0 | 10.4 | 52.8 | 93.9 | 90.1 |
| 14-Dec-89 | 0.9 | 1.392 | 362 | 66.0 | 7.5 | 22.8 | 7.2 | 22.8 | 7.2 | 36.6 | 65.1 | 74.9 |
| 15-Dec-89 | 0.8 | 1.238 | 253 | 52.1 | 6.1 | 19.3 | 6.1 | 19.3 | 6.1 | 30.9 | 54.9 | 55.6 |
| 16-Dec-89 | 0.8 | 1.238 | 233 | 48.1 | 5.7 | 18.0 | 5.7 | 18.0 | 5.7 | 29.0 | 51.4 | 37.3 |
| 17-Dec-89 | 0.8 | 1.238 | 222 | 45.8 | 5.5 | 17.3 | 5.5 | 17.3 | 5.5 | 27.9 | 49.5 | 31.1 |
| 18-Dec-89 | 0.9 | 1.392 | 212 | 39.1 | 4.8 | 14.9 | 4.7 | 14.9 | 4.7 | 23.9 | 42.4 | 27.9 |
| 19-Dec-89 | 0.7 | 1.083 | 180 | 42.5 | 5.2 | 16.8 | 5.3 | 16.8 | 5.2 | 26.9 | 46.5 | 26.9 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mgN/L. WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs) | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mgN/L) | Acute (mgN/L) | Chronic (mgN/L) |
| 20-Dec-89 | 0.7 | 1.083 | 130 | 31.0 | 4.0 | 12.9 | 4.1 | 12.9 | 4.0 | 20.8 | 36.1 | 24.9 |
| 21-Dec-89 | 0.8 | 1.238 | 125 | 26.2 | 3.5 | 11.0 | 3.5 | 11.0 | 3.5 | 17.6 | 31.3 | 22.3 |
| 22-Dec-89 | 0.7 | 1.083 | 129 | 30.8 | 4.0 | 12.8 | 4.1 | 12.8 | 4.0 | 20.6 | 35.9 | 21.5 |
| 23-Dec-89 | 0.7 | 1.083 | 127 | 30.3 | 3.9 | 12.7 | 4.0 | 12.7 | 3.9 | 20.4 | 35.5 | 19.9 |
| 24-Dec-89 | 0.6 | 0.928 | 121 | 33.6 | 4.3 | 14.2 | 4.5 | 14.2 | 4.3 | 22.8 | 38.4 | 20.4 |
| 25-Dec-89 | 0.6 | 0.928 | 125 | 34.7 | 4.4 | 14.6 | 4.6 | 14.6 | 4.4 | 23.4 | 39.4 | 21.8 |
| 26-Dec-89 | 0.7 | 1.083 | 128 | 30.5 | 4.0 | 12.8 | 4.0 | 12.8 | 4.0 | 20.5 | 35.7 | 21.8 |
| 27-Dec-89 | 1 | 1.547 | 134 | 22.7 | 3.2 | 9.3 | 2.9 | 9.3 | 2.9 | 15.0 | 26.5 | 20.4 |
| 28-Dec-89 | 0.8 | 1.238 | 126 | 26.4 | 3.5 | 11.0 | 3.5 | 11.0 | 3.5 | 17.8 | 31.5 | 19.2 |
| 29-Dec-89 | 0.8 | 1.238 | 124 | 26.0 | 3.5 | 10.9 | 3.4 | 10.9 | 3.4 | 17.5 | 31.1 | 17.7 |
| 30-Dec-89 | 0.8 | 1.238 | 125 | 26.2 | 3.5 | 11.0 | 3.5 | 11.0 | 3.5 | 17.6 | 31.3 | 17.0 |
| 31-Dec-89 | 1 | 1.547 | 127 | 21.5 | 3.1 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.4 | 16.8 |
| 01-Jan-90 | 1 | 1.547 | 134 | 22.7 | 3.2 | 9.3 | 2.9 | 9.3 | 2.9 | 15.0 | 26.5 | 16.1 |
| 02-Jan-90 | 1 | 1.547 | 123 | 20.9 | 3.0 | 8.7 | 2.7 | 8.7 | 2.7 | 14.0 | 24.8 | 15.2 |
| 03-Jan-90 | 1 | 1.547 | 126 | 21.4 | 3.0 | 8.8 | 2.8 | 8.8 | 2.8 | 14.3 | 25.3 | 14.4 |
| 04-Jan-90 | 1.1 | 1.702 | 142 | 21.9 | 3.1 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.3 | 14.4 |
| 05-Jan-90 | 2.3 | 3.559 | 156 | 12.0 | 2.1 | 4.6 | 1.5 | 4.6 | 1.5 | 7.5 | 13.2 | 12.5 |
| 06-Jan-90 | 2.2 | 3.404 | 235 | 18.3 | 2.7 | 6.7 | 2.1 | 6.7 | 2.1 | 10.7 | 19.0 | 11.7 |
| 07-Jan-90 | 3.8 | 5.879 | 797 | 34.9 | 4.4 | 10.2 | 3.2 | 10.2 | 3.2 | 16.5 | 29.2 | 12.2 |
| 08-Jan-90 | 4.8 | 7.427 | 1620 | 55.5 | 6.5 | 14.3 | 4.5 | 14.3 | 4.5 | 23.0 | 40.8 | 14.4 |
| 09-Jan-90 | 5.4 | 8.355 | 5320 | 160.2 | 16.9 | 33.0 | 10.4 | 33.0 | 10.4 | 53.0 | 94.1 | 25.8 |
| 10-Jan-90 | 3.5 | 5.415 | 5840 | 270.6 | 28.0 | 54.9 | 17.4 | 54.9 | 17.4 | 88.0 | 156.4 | 45.1 |
| 11-Jan-90 | 2.2 | 3.404 | 10800 | 794.2 | 80.3 | 143.3 | 45.3 | 143.3 | 45.3 | 229.3 | 407.9 | 98.3 |
| 12-Jan-90 | 1.6 | 2.476 | 4560 | 461.5 | 47.1 | 98.4 | 31.1 | 98.4 | 31.1 | 157.6 | 280.2 | 132.0 |
| 13-Jan-90 | 1.3 | 2.011 | 2480 | 309.2 | 31.8 | 74.2 | 23.5 | 74.2 | 23.5 | 118.8 | 211.3 | 148.4 |
| 14-Jan-90 | 1.2 | 1.857 | 1980 | 267.8 | 27.7 | 67.1 | 21.2 | 67.1 | 21.2 | 107.4 | 191.0 | 153.3 |
| 15-Jan-90 | 1.3 | 2.011 | 1880 | 234.7 | 24.4 | 59.4 | 18.8 | 59.4 | 18.8 | 95.1 | 169.1 | 119.7 |
| 16-Jan-90 | 1.1 | 1.702 | 1760 | 259.5 | 26.9 | 66.6 | 21.0 | 66.6 | 21.0 | 106.6 | 189.5 | 107.0 |
| 17-Jan-90 | 1 | 1.547 | 713 | 116.2 | 12.5 | 35.4 | 11.2 | 35.4 | 11.2 | 56.7 | 100.9 | 91.5 |
| 18-Jan-90 | 1 | 1.547 | 829 | 135.0 | 14.4 | 40.0 | 12.6 | 40.0 | 12.6 | 64.0 | 113.8 | 80.6 |
| 19-Jan-90 | 1 | 1.547 | 756 | 123.2 | 13.2 | 37.1 | 11.7 | 37.1 | 11.7 | 59.5 | 105.7 | 71.7 |
| 20-Jan-90 | 0.7 | 1.083 | 767 | 178.0 | 18.7 | 53.6 | 17.0 | 53.6 | 17.0 | 85.9 | 152.7 | 66.5 |
| 21-Jan-90 | 0.9 | 1.392 | 1120 | 202.1 | 21.1 | 56.5 | 17.9 | 56.5 | 17.9 | 90.6 | 161.0 | 75.0 |
| 22-Jan-90 | 1.5 | 2.321 | 1410 | 152.9 | 16.2 | 40.8 | 12.9 | 40.8 | 12.9 | 65.5 | 116.4 | 75.3 |
| 23-Jan-90 | 1.3 | 2.011 | 1350 | 168.8 | 17.8 | 45.5 | 14.4 | 45.5 | 14.4 | 72.9 | 129.6 | 78.7 |
| 24-Jan-90 | 1 | 1.547 | 757 | 123.3 | 13.2 | 37.2 | 11.7 | 37.2 | 11.7 | 59.5 | 105.8 | 72.1 |
| 25-Jan-90 | 1.7 | 2.630 | 301 | 29.6 | 3.9 | 10.5 | 3.3 | 10.5 | 3.3 | 16.8 | 29.9 | 53.7 |
| 26-Jan-90 | 1.3 | 2.011 | 238 | 30.6 | 4.0 | 11.3 | 3.6 | 11.3 | 3.6 | 18.2 | 32.3 | 41.9 |
| 27-Jan-90 | 1.7 | 2.630 | 184 | 18.5 | 2.7 | 7.1 | 2.2 | 7.1 | 2.2 | 11.4 | 20.2 | 26.5 |
| 28-Jan-90 | 2.3 | 3.559 | 270 | 20.0 | 2.9 | 7.1 | 2.2 | 7.1 | 2.2 | 11.5 | 20.3 | 14.5 |
| 29-Jan-90 | 2 | 3.094 | 251 | 21.3 | 3.0 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 22.0 | 13.4 |
| 30-Jan-90 | 1.7 | 2.630 | 169 | 17.1 | 2.6 | 6.6 | 2.1 | 6.6 | 2.1 | 10.7 | 18.9 | 11.5 |
| 31-Jan-90 | 1.8 | 2.785 | 147 | 14.2 | 2.3 | 5.6 | 1.8 | 5.6 | 1.8 | 9.0 | 16.0 | 10.9 |
| 01-Feb-90 | 1.6 | 2.476 | 146 | 15.7 | 2.5 | 6.2 | 2.0 | 6.2 | 2.0 | 10.1 | 17.9 | 10.6 |
| 02-Feb-90 | 1.5 | 2.321 | 138 | 15.9 | 2.5 | 6.4 | 2.0 | 6.4 | 2.0 | 10.3 | 18.2 | 10.0 |
| 03-Feb-90 | 1.8 | 2.785 | 156 | 15.0 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.5 | 16.8 | 9.7 |
| 04-Feb-90 | 1.8 | 2.785 | 156 | 15.0 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.5 | 16.8 | 9.8 |
| 05-Feb-90 | 1.8 | 2.785 | 149 | 14.4 | 2.3 | 5.7 | 1.8 | 5.7 | 1.8 | 9.1 | 16.2 | 9.6 |
| 06-Feb-90 | 1.7 | 2.630 | 147 | 15.0 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.6 | 16.9 | 9.4 |
| 07-Feb-90 | 1.6 | 2.476 | 141 | 15.2 | 2.4 | 6.1 | 1.9 | 6.1 | 1.9 | 9.8 | 17.4 | 9.5 |
| 08-Feb-90 | 1.7 | 2.630 | 149 | 15.2 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.7 | 17.1 | 9.5 |
| 09-Feb-90 | 1.9 | 2.940 | 160 | 14.6 | 2.4 | 5.7 | 1.8 | 5.7 | 1.8 | 9.2 | 16.2 | 9.6 |
| 10-Feb-90 | 1.9 | 2.940 | 2300 | 196.6 | 20.6 | 47.8 | 15.1 | 47.8 | 15.1 | 76.6 | 136.2 | 26.3 |
| 11-Feb-90 | 1.9 | 2.940 | 3940 | 336.1 | 34.5 | 73.7 | 23.3 | 73.7 | 23.3 | 118.0 | 209.9 | 53.4 |
| 12-Feb-90 | 1.7 | 2.630 | 2460 | 234.8 | 24.4 | 56.4 | 17.8 | 56.4 | 17.8 | 90.3 | 160.6 | 73.5 |
| 13-Feb-90 | 1.6 | 2.476 | 1960 | 198.9 | 20.8 | 49.9 | 15.8 | 49.9 | 15.8 | 80.0 | 142.1 | 91.2 |
| 14-Feb-90 | 1.3 | 2.011 | 1560 | 194.9 | 20.4 | 51.1 | 16.2 | 51.1 | 16.2 | 81.9 | 145.6 | 92.5 |
| 15-Feb-90 | 1.6 | 2.476 | 1460 | 148.4 | 15.7 | 39.4 | 12.5 | 39.4 | 12.5 | 63.1 | 112.2 | 78.8 |
| 16-Feb-90 | 1.4 | 2.166 | 1230 | 143.0 | 15.2 | 39.2 | 12.4 | 39.2 | 12.4 | 62.8 | 111.7 | 72.0 |
| 17-Feb-90 | 1.1 | 1.702 | 949 | 140.4 | 14.9 | 40.5 | 12.8 | 40.5 | 12.8 | 64.9 | 115.4 | 68.2 |
| 18-Feb-90 | 1 | 1.547 | 868 | 141.3 | 15.0 | 41.5 | 13.1 | 41.5 | 13.1 | 66.4 | 118.1 | 64.3 |
| 19-Feb-90 | 1.1 | 1.702 | 824 | 122.0 | 13.1 | 36.2 | 11.4 | 36.2 | 11.4 | 58.0 | 103.0 | 63.0 |
| 20-Feb-90 | 1.9 | 2.940 | 1100 | 94.5 | 10.4 | 26.4 | 8.4 | 26.4 | 8.4 | 42.4 | 75.3 | 57.9 |
| 21-Feb-90 | 1.7 | 2.630 | 1360 | 130.3 | 13.9 | 35.0 | 11.1 | 35.0 | 11.1 | 56.1 | 99.8 | 55.7 |
| 22-Feb-90 | 1.3 | 2.011 | 564 | 71.1 | 8.0 | 22.6 | 7.1 | 22.6 | 7.1 | 36.2 | 64.4 | 48.2 |
| 23-Feb-90 | 1.2 | 1.857 | 757 | 102.9 | 11.2 | 31.0 | 9.8 | 31.0 | 9.8 | 49.7 | 88.2 | 46.1 |
| 24-Feb-90 | 0.9 | 1.392 | 583 | 105.7 | 11.5 | 33.5 | 10.6 | 33.5 | 10.6 | 53.6 | 95.3 | 48.9 |
| 25-Feb-90 | 0.9 | 1.392 | 663 | 120.0 | 12.9 | 37.1 | 11.7 | 37.1 | 11.7 | 59.5 | 105.7 | 49.7 |
| 26-Feb-90 | 0.9 | 1.392 | 622 | 112.7 | 12.2 | 35.2 | 11.1 | 35.2 | 11.1 | 56.5 | 100.4 | 54.8 |
| 27-Feb-90 | 1 | 1.547 | 300 | 49.5 | 5.8 | 17.7 | 5.6 | 17.7 | 5.6 | 28.4 | 50.4 | 49.5 |
| 28-Feb-90 | 0.8 | 1.238 | 230 | 47.5 | 5.6 | 17.8 | 5.6 | 17.8 | 5.6 | 28.7 | 50.9 | 43.2 |
| 01-Mar-90 | 0.8 | 1.238 | 240 | 49.5 | 5.8 | 18.5 | 5.8 | 18.5 | 5.8 | 29.6 | 52.7 | 35.8 |
| 02-Mar-90 | 0.8 | 1.238 | 130 | 27.3 | 3.6 | 11.3 | 3.6 | 11.3 | 3.6 | 18.2 | 32.3 | 26.2 |
| 03-Mar-90 | 0.8 | 1.238 | 125 | 26.2 | 3.5 | 11.0 | 3.5 | 11.0 | 3.5 | 17.6 | 31.3 | 23.5 |
| 04-Mar-90 | 0.7 | 1.083 | 120 | 28.7 | 3.8 | 12.1 | 3.8 | 12.1 | 3.8 | 19.5 | 34.0 | 21.2 |
| 05-Mar-90 | 0.7 | 1.083 | 200 | 47.2 | 5.6 | 18.2 | 5.8 | 18.2 | 5.6 | 29.3 | 50.6 | 21.1 |
| 06-Mar-90 | 0.9 | 1.392 | 512 | 92.9 | 10.2 | 30.1 | 9.5 | 30.1 | 9.5 | 48.3 | 85.9 | 28.7 |
| 07-Mar-90 | 1.5 | 2.321 | 329 | 36.4 | 4.5 | 12.7 | 4.0 | 12.7 | 4.0 | 20.4 | 36.3 | 29.4 |
| 08-Mar-90 | 1.7 | 2.630 | 362 | 35.4 | 4.4 | 12.1 | 3.8 | 12.1 | 3.8 | 19.5 | 34.6 | 29.4 |
| 09-Mar-90 | 1.7 | 2.630 | 210 | 21.0 | 3.0 | 7.9 | 2.5 | 7.9 | 2.5 | 12.7 | 22.4 | 25.2 |
| 10-Mar-90 | 1.6 | 2.476 | 354 | 36.8 | 4.6 | 12.6 | 4.0 | 12.6 | 4.0 | 20.3 | 36.1 | 18.2 |
| 11-Mar-90 | 1.4 | 2.166 | 190 | 22.9 | 3.2 | 8.8 | 2.8 | 8.8 | 2.8 | 14.2 | 25.1 | 16.7 |
| 12-Mar-90 | 1.2 | 1.857 | 130 | 18.5 | 2.8 | 7.6 | 2.4 | 7.6 | 2.4 | 12.2 | 21.6 | 14.8 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mgN/L, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs) | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mgN/L) | Acute (mgN/L) | Chronic (mgN/L) |
| 13-Mar-90 | 1.3 | 2.011 | 120 | 15.9 | 2.5 | 8.6 | 2.1 | 6.6 | 2.1 | 10.6 | 18.8 | 14.3 |
| 14-Mar-90 | 1.2 | 1.857 | 140 | 19.9 | 2.9 | 8.0 | 2.5 | 8.0 | 2.5 | 12.9 | 22.9 | 12.5 |
| 15-Mar-90 | 1.4 | 2.166 | 555 | 65.1 | 7.4 | 20.7 | 6.5 | 20.7 | 6.5 | 33.2 | 59.0 | 17.2 |
| 16-Mar-90 | 1.1 | 1.702 | 1030 | 152.3 | 16.1 | 43.3 | 13.7 | 43.3 | 13.7 | 69.3 | 123.2 | 31.5 |
| 17-Mar-90 | 1.2 | 1.857 | 925 | 125.6 | 13.5 | 36.4 | 11.5 | 36.4 | 11.5 | 58.3 | 103.6 | 43.4 |
| 18-Mar-90 | 1.2 | 1.857 | 208 | 29.0 | 3.8 | 11.0 | 3.5 | 11.0 | 3.5 | 17.7 | 31.4 | 44.6 |
| 19-Mar-90 | 1.1 | 1.702 | 389 | 58.1 | 6.7 | 19.8 | 6.3 | 19.8 | 6.3 | 31.8 | 56.4 | 44.3 |
| 20-Mar-90 | 1.1 | 1.702 | 749 | 111.0 | 12.0 | 33.5 | 10.6 | 33.5 | 10.6 | 53.7 | 95.4 | 40.4 |
| 21-Mar-90 | 1.1 | 1.702 | 731 | 108.4 | 11.7 | 32.8 | 10.4 | 32.8 | 10.4 | 52.7 | 93.6 | 39.0 |
| 22-Mar-90 | 1.4 | 2.166 | 468 | 55.0 | 6.4 | 18.1 | 5.7 | 18.1 | 5.7 | 29.0 | 51.5 | 41.8 |
| 23-Mar-90 | 1.4 | 2.166 | 724 | 84.6 | 9.4 | 25.6 | 8.1 | 25.6 | 8.1 | 41.1 | 73.0 | 44.1 |
| 24-Mar-90 | 1.1 | 1.702 | 568 | 84.4 | 9.3 | 26.8 | 8.5 | 26.8 | 8.5 | 43.0 | 76.4 | 41.4 |
| 25-Mar-90 | 1 | 1.547 | 283 | 46.7 | 5.6 | 16.9 | 5.3 | 16.9 | 5.3 | 27.1 | 48.1 | 35.0 |
| 26-Mar-90 | 1 | 1.547 | 125 | 21.2 | 3.0 | 8.8 | 2.8 | 8.8 | 2.8 | 14.2 | 25.1 | 31.3 |
| 27-Mar-90 | 0.8 | 1.238 | 111 | 23.4 | 3.2 | 10.0 | 3.2 | 10.0 | 3.2 | 16.1 | 28.5 | 25.1 |
| 28-Mar-90 | 0.9 | 1.392 | 117 | 22.0 | 3.1 | 9.3 | 2.9 | 9.3 | 2.9 | 14.9 | 26.4 | 18.1 |
| 29-Mar-90 | 0.9 | 1.392 | 113 | 21.3 | 3.0 | 9.0 | 2.8 | 9.0 | 2.8 | 14.5 | 25.7 | 14.9 |
| 30-Mar-90 | 0.7 | 1.083 | 439 | 102.3 | 11.1 | 34.2 | 10.8 | 34.2 | 10.8 | 54.9 | 97.5 | 25.1 |
| 31-Mar-90 | 0.7 | 1.083 | 222 | 52.2 | 6.1 | 19.8 | 6.3 | 19.8 | 6.1 | 31.8 | 55.2 | 29.0 |
| 01-Apr-90 | 0.6 | 0.928 | 134 | 37.1 | 4.6 | 15.4 | 4.9 | 15.4 | 4.6 | 24.8 | 41.6 | 31.5 |
| 02-Apr-90 | 0.9 | 1.392 | 367 | 66.9 | 7.6 | 23.1 | 7.3 | 23.1 | 7.3 | 37.0 | 65.8 | 37.1 |
| 03-Apr-90 | 0.7 | 1.083 | 401 | 93.6 | 10.3 | 31.8 | 10.1 | 31.8 | 10.1 | 51.0 | 90.7 | 36.2 |
| 04-Apr-90 | 0.7 | 1.083 | 339 | 79.3 | 8.8 | 27.8 | 8.8 | 27.8 | 8.8 | 44.6 | 79.3 | 39.4 |
| 05-Apr-90 | 0.6 | 0.928 | 369 | 100.4 | 10.9 | 34.7 | 11.0 | 34.7 | 10.9 | 55.7 | 98.5 | 47.1 |
| 06-Apr-90 | 0.7 | 1.083 | 298 | 69.8 | 7.9 | 25.1 | 7.9 | 25.1 | 7.9 | 40.2 | 71.0 | 47.9 |
| 07-Apr-90 | 0.6 | 0.928 | 398 | 108.2 | 11.7 | 36.9 | 11.7 | 36.9 | 11.7 | 59.2 | 105.1 | 49.9 |
| 08-Apr-90 | 0.6 | 0.928 | 568 | 154.0 | 16.3 | 49.1 | 15.5 | 49.1 | 15.5 | 78.7 | 139.9 | 58.4 |
| 09-Apr-90 | 0.8 | 1.238 | 381 | 78.0 | 8.7 | 26.7 | 8.5 | 26.7 | 8.5 | 42.9 | 76.2 | 55.2 |
| 10-Apr-90 | 0.6 | 0.928 | 633 | 171.5 | 18.0 | 53.6 | 16.9 | 53.6 | 16.9 | 85.8 | 152.6 | 66.6 |
| 11-Apr-90 | 0.7 | 1.083 | 708 | 164.4 | 17.3 | 50.3 | 15.9 | 50.3 | 15.9 | 80.5 | 143.2 | 72.0 |
| 12-Apr-90 | 0.6 | 0.928 | 581 | 157.5 | 16.6 | 50.0 | 15.8 | 50.0 | 15.8 | 80.1 | 142.5 | 72.4 |
| 13-Apr-90 | 1 | 1.547 | 507 | 82.9 | 9.2 | 26.9 | 8.5 | 26.9 | 8.5 | 43.2 | 76.7 | 72.4 |
| 14-Apr-90 | 0.7 | 1.083 | 1150 | 266.5 | 27.5 | 74.2 | 23.5 | 74.2 | 23.5 | 118.9 | 211.4 | 80.7 |
| 15-Apr-90 | 0.7 | 1.083 | 1580 | 365.7 | 37.5 | 95.9 | 30.3 | 95.9 | 30.3 | 153.5 | 272.9 | 98.9 |
| 16-Apr-90 | 1.1 | 1.702 | 1720 | 253.7 | 26.3 | 65.3 | 20.7 | 65.3 | 20.7 | 104.6 | 186.0 | 105.0 |
| 17-Apr-90 | 0.8 | 1.238 | 1670 | 338.3 | 34.7 | 87.7 | 27.7 | 87.7 | 27.7 | 140.4 | 249.7 | 129.4 |
| 18-Apr-90 | 0.7 | 1.083 | 1420 | 328.8 | 33.8 | 88.0 | 27.8 | 88.0 | 27.8 | 140.9 | 250.5 | 134.9 |
| 19-Apr-90 | 0.7 | 1.083 | 1420 | 328.8 | 33.8 | 88.0 | 27.8 | 88.0 | 27.8 | 140.9 | 250.5 | 131.7 |
| 20-Apr-90 | 0.9 | 1.392 | 1170 | 211.1 | 22.0 | 58.6 | 18.5 | 58.6 | 18.5 | 93.8 | 166.8 | 129.0 |
| 21-Apr-90 | 0.7 | 1.083 | 900 | 208.7 | 21.8 | 61.0 | 19.3 | 61.0 | 19.3 | 97.6 | 173.6 | 118.3 |
| 22-Apr-90 | 1.1 | 1.702 | 788 | 116.8 | 12.6 | 34.9 | 11.0 | 34.9 | 11.0 | 55.9 | 99.4 | 97.1 |
| 23-Apr-90 | 1.2 | 1.857 | 1540 | 208.4 | 21.7 | 54.8 | 17.3 | 54.8 | 17.3 | 87.8 | 156.1 | 83.8 |
| 24-Apr-90 | 1 | 1.547 | 1830 | 296.7 | 30.6 | 75.5 | 23.9 | 75.5 | 23.9 | 121.0 | 215.1 | 90.6 |
| 25-Apr-90 | 1.4 | 2.166 | 771 | 90.0 | 9.9 | 26.9 | 8.5 | 26.9 | 8.5 | 43.2 | 76.8 | 77.0 |
| 26-Apr-90 | 1.2 | 1.857 | 1010 | 137.0 | 14.6 | 39.0 | 12.3 | 39.0 | 12.3 | 62.6 | 111.2 | 78.6 |
| 27-Apr-90 | 1.9 | 2.940 | 989 | 85.1 | 9.4 | 24.3 | 7.7 | 24.3 | 7.7 | 38.9 | 69.2 | 66.4 |
| 28-Apr-90 | 1.8 | 2.785 | 1220 | 110.5 | 12.0 | 30.3 | 9.6 | 30.3 | 9.6 | 48.6 | 86.4 | 48.3 |
| 29-Apr-90 | 1.9 | 2.940 | 1360 | 116.7 | 12.6 | 31.3 | 9.9 | 31.3 | 9.9 | 50.2 | 89.3 | 50.1 |
| 30-Apr-90 | 1.6 | 2.476 | 1120 | 114.1 | 12.3 | 31.8 | 10.1 | 31.8 | 10.1 | 51.0 | 90.7 | 47.2 |
| 01-Nov-90 | 1.3 | 2.011 | 171 | 22.3 | 3.1 | 8.7 | 2.7 | 8.7 | 2.7 | 14.0 | 24.8 | |
| 02-Nov-90 | 1.1 | 1.702 | 170 | 26.0 | 3.5 | 10.2 | 3.2 | 10.2 | 3.2 | 16.4 | 29.2 | |
| 03-Nov-90 | 1.3 | 2.011 | 227 | 29.2 | 3.8 | 10.9 | 3.4 | 10.9 | 3.4 | 17.6 | 31.1 | |
| 04-Nov-90 | 1.4 | 2.166 | 1010 | 117.6 | 12.7 | 33.5 | 10.6 | 33.5 | 10.6 | 53.7 | 95.4 | 25.4 |
| 05-Nov-90 | 1 | 1.547 | 781 | 127.2 | 13.6 | 38.1 | 12.0 | 38.1 | 12.0 | 61.1 | 108.5 | 37.2 |
| 06-Nov-90 | 1.2 | 1.857 | 195 | 27.3 | 3.6 | 10.5 | 3.3 | 10.5 | 3.3 | 16.8 | 29.8 | 37.3 |
| 07-Nov-90 | 1.3 | 2.011 | 168 | 21.9 | 3.1 | 8.6 | 2.7 | 8.6 | 2.7 | 13.8 | 24.5 | 36.3 |
| 08-Nov-90 | 1.5 | 2.321 | 169 | 19.2 | 2.8 | 7.5 | 2.4 | 7.5 | 2.4 | 12.1 | 21.4 | 25.9 |
| 09-Nov-90 | 3.8 | 5.879 | 717 | 31.5 | 4.0 | 9.4 | 3.0 | 9.4 | 3.0 | 15.1 | 26.9 | 14.5 |
| 10-Nov-90 | 2.7 | 4.177 | 2520 | 151.8 | 16.1 | 36.2 | 11.5 | 36.2 | 11.5 | 58.0 | 103.2 | 24.8 |
| 11-Nov-90 | 1.7 | 2.630 | 1550 | 148.3 | 15.7 | 38.9 | 12.3 | 38.9 | 12.3 | 62.3 | 110.8 | 36.9 |
| 12-Nov-90 | 2.6 | 4.023 | 1030 | 65.0 | 7.4 | 18.3 | 5.8 | 18.3 | 5.8 | 29.4 | 52.3 | 41.2 |
| 13-Nov-90 | 4.4 | 6.808 | 1240 | 46.5 | 5.6 | 12.6 | 4.0 | 12.6 | 4.0 | 20.3 | 36.0 | 42.5 |
| 14-Nov-90 | 2.9 | 4.487 | 1630 | 91.8 | 10.1 | 23.8 | 7.5 | 23.8 | 7.5 | 38.1 | 67.7 | 37.5 |
| 15-Nov-90 | 2.2 | 3.404 | 1500 | 111.2 | 12.0 | 29.3 | 9.3 | 29.3 | 9.3 | 47.0 | 83.5 | 33.7 |
| 16-Nov-90 | 1.6 | 2.476 | 1100 | 112.1 | 12.1 | 31.4 | 9.9 | 31.4 | 9.9 | 50.3 | 89.4 | 38.9 |
| 17-Nov-90 | 2.1 | 3.249 | 584 | 45.9 | 5.5 | 14.4 | 4.6 | 14.4 | 4.6 | 23.1 | 41.1 | 39.6 |
| 18-Nov-90 | 1.7 | 2.630 | 459 | 44.6 | 5.4 | 14.7 | 4.6 | 14.7 | 4.6 | 23.5 | 41.8 | 36.0 |
| 19-Nov-90 | 1.6 | 2.476 | 279 | 29.2 | 3.8 | 10.5 | 3.3 | 10.5 | 3.3 | 16.8 | 29.9 | 28.5 |
| 20-Nov-90 | 1.6 | 2.476 | 193 | 20.5 | 2.9 | 7.8 | 2.5 | 7.8 | 2.5 | 12.6 | 22.3 | 19.0 |
| 21-Nov-90 | 2.6 | 4.023 | 179 | 12.1 | 2.1 | 4.5 | 1.4 | 4.5 | 1.4 | 7.4 | 13.0 | 15.1 |
| 22-Nov-90 | 3.1 | 4.796 | 727 | 38.9 | 4.8 | 11.6 | 3.7 | 11.6 | 3.7 | 18.7 | 33.2 | 13.9 |
| 23-Nov-90 | 3.9 | 6.034 | 2350 | 98.4 | 10.7 | 23.7 | 7.5 | 23.7 | 7.5 | 38.1 | 67.6 | 19.2 |
| 24-Nov-90 | 5 | 7.736 | 3840 | 125.1 | 13.4 | 27.5 | 8.7 | 27.5 | 8.7 | 44.0 | 78.3 | 27.0 |
| 25-Nov-90 | 4.1 | 6.344 | 3960 | 157.1 | 16.6 | 34.3 | 10.9 | 34.3 | 10.9 | 55.0 | 97.8 | 39.0 |
| 26-Nov-90 | 2.7 | 4.177 | 4970 | 298.4 | 30.7 | 62.5 | 19.8 | 62.5 | 19.8 | 100.1 | 178.1 | 59.3 |
| 27-Nov-90 | 2 | 3.094 | 5390 | 436.5 | 44.5 | 90.1 | 28.5 | 90.1 | 28.5 | 144.2 | 256.5 | 85.9 |
| 28-Nov-90 | 1.7 | 2.630 | 5770 | 549.4 | 55.8 | 112.0 | 35.4 | 112.0 | 35.4 | 179.2 | 318.7 | 119.7 |
| 29-Nov-90 | 2.7 | 4.177 | 5240 | 314.6 | 32.4 | 65.2 | 20.6 | 65.2 | 20.6 | 104.5 | 185.8 | 132.0 |
| 30-Nov-90 | 2.2 | 3.404 | 3280 | 241.9 | 25.1 | 54.9 | 17.4 | 54.9 | 17.4 | 88.0 | 156.4 | 129.0 |
| 01-Dec-90 | 2.5 | 3.868 | 2630 | 171.0 | 18.0 | 40.5 | 12.8 | 40.5 | 12.8 | 64.9 | 115.3 | 109.1 |
| 02-Dec-90 | 2.3 | 3.559 | 2310 | 163.3 | 17.2 | 39.6 | 12.5 | 39.6 | 12.5 | 63.5 | 112.9 | 80.2 |
| 03-Dec-90 | 3.1 | 4.796 | 2150 | 113.1 | 12.2 | 27.8 | 8.8 | 27.8 | 8.8 | 44.5 | 79.1 | 65.2 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mg/L, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs) | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mg/L) | Acute (mg/L) | Chronic (mg/L) |
| 04-Dec-90 | 3 | 4.642 | 2450 | 133.0 | 14.2 | 31.9 | 10.1 | 31.9 | 10.1 | 51.1 | 90.8 | 56.0 |
| 05-Dec-90 | 2.6 | 4.023 | 2070 | 129.6 | 13.9 | 32.1 | 10.2 | 32.1 | 10.2 | 51.5 | 91.5 | 52.7 |
| 06-Dec-90 | 2.3 | 3.559 | 1720 | 121.8 | 13.1 | 31.3 | 9.9 | 31.3 | 9.9 | 50.1 | 89.1 | 49.3 |
| 07-Dec-90 | 2.2 | 3.404 | 1390 | 103.1 | 11.2 | 27.6 | 8.7 | 27.6 | 8.7 | 44.2 | 78.5 | 49.2 |
| 08-Dec-90 | 2.1 | 3.249 | 1340 | 104.1 | 11.3 | 28.0 | 8.9 | 28.0 | 8.9 | 44.9 | 79.9 | 47.7 |
| 09-Dec-90 | 2.5 | 3.868 | 1500 | 97.9 | 10.7 | 25.8 | 8.2 | 25.8 | 8.2 | 41.3 | 73.5 | 45.2 |
| 10-Dec-90 | 3.2 | 4.951 | 1720 | 87.9 | 9.7 | 22.5 | 7.1 | 22.5 | 7.1 | 36.1 | 64.1 | 41.6 |
| 11-Dec-90 | 2.7 | 4.177 | 1750 | 105.7 | 11.5 | 27.0 | 8.5 | 27.0 | 8.5 | 43.3 | 77.0 | 41.4 |
| 12-Dec-90 | 2.3 | 3.559 | 1620 | 114.8 | 12.4 | 29.8 | 9.4 | 29.8 | 9.4 | 47.8 | 84.9 | 42.1 |
| 13-Dec-90 | 2.1 | 3.249 | 1350 | 104.9 | 11.4 | 28.2 | 8.9 | 28.2 | 8.9 | 45.2 | 80.3 | 43.1 |
| 14-Dec-90 | 1.9 | 2.940 | 1200 | 103.1 | 11.2 | 28.3 | 9.0 | 28.3 | 9.0 | 45.4 | 80.8 | 45.4 |
| 15-Dec-90 | 1.9 | 2.940 | 1130 | 97.1 | 10.6 | 27.0 | 8.5 | 27.0 | 8.5 | 43.3 | 77.0 | 45.4 |
| 16-Dec-90 | 2 | 3.094 | 1050 | 85.8 | 9.5 | 24.2 | 7.6 | 24.2 | 7.6 | 38.8 | 68.9 | 43.2 |
| 17-Dec-90 | 2 | 3.094 | 1150 | 93.9 | 10.3 | 26.0 | 8.2 | 26.0 | 8.2 | 41.7 | 74.2 | 42.3 |
| 18-Dec-90 | 1.9 | 2.940 | 1410 | 120.9 | 13.0 | 32.3 | 10.2 | 32.3 | 10.2 | 51.7 | 91.9 | 43.9 |
| 19-Dec-90 | 1.9 | 2.940 | 1180 | 101.4 | 11.0 | 28.0 | 8.8 | 28.0 | 8.8 | 44.8 | 79.7 | 44.3 |
| 20-Dec-90 | 2 | 3.094 | 1150 | 93.9 | 10.3 | 26.0 | 8.2 | 26.0 | 8.2 | 41.7 | 74.2 | 45.0 |
| 21-Dec-90 | 1.9 | 2.940 | 1170 | 100.5 | 11.0 | 27.8 | 8.8 | 27.8 | 8.8 | 44.5 | 79.1 | 45.7 |
| 22-Dec-90 | 1.7 | 2.630 | 1360 | 130.3 | 13.9 | 35.0 | 11.1 | 35.0 | 11.1 | 56.1 | 99.8 | 46.8 |
| 23-Dec-90 | 1.8 | 2.785 | 1260 | 114.1 | 12.3 | 31.1 | 9.8 | 31.1 | 9.8 | 49.9 | 88.6 | 48.1 |
| 24-Dec-90 | 1.6 | 2.476 | 1180 | 120.2 | 12.9 | 33.2 | 10.5 | 33.2 | 10.5 | 53.2 | 94.6 | 50.9 |
| 25-Dec-90 | 1.6 | 2.476 | 1110 | 113.1 | 12.2 | 31.6 | 10.0 | 31.6 | 10.0 | 50.7 | 90.0 | 52.5 |
| 26-Dec-90 | 1.9 | 2.940 | 856 | 73.8 | 8.3 | 21.6 | 6.8 | 21.6 | 6.8 | 34.7 | 61.6 | 47.1 |
| 27-Dec-90 | 1.8 | 2.785 | 777 | 70.7 | 8.0 | 21.1 | 6.7 | 21.1 | 6.7 | 33.9 | 60.2 | 43.1 |
| 28-Dec-90 | 2.1 | 3.249 | 429 | 34.0 | 4.3 | 11.2 | 3.6 | 11.2 | 3.6 | 18.1 | 32.1 | 34.3 |
| 29-Dec-90 | 1.8 | 2.785 | 238 | 22.4 | 3.1 | 8.2 | 2.6 | 8.2 | 2.6 | 13.2 | 23.4 | 25.0 |
| 30-Dec-90 | 1.7 | 2.630 | 297 | 29.2 | 3.8 | 10.3 | 3.3 | 10.3 | 3.3 | 16.7 | 29.5 | 20.5 |
| 31-Dec-90 | 1.9 | 2.940 | 259 | 23.0 | 3.2 | 8.3 | 2.6 | 8.3 | 2.6 | 13.4 | 23.7 | 15.3 |
| 01-Jan-91 | 1.5 | 2.321 | 209 | 23.5 | 3.3 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.3 | 14.4 |
| 02-Jan-91 | 1.6 | 2.476 | 182 | 19.4 | 2.8 | 7.4 | 2.4 | 7.4 | 2.4 | 12.0 | 21.3 | 14.1 |
| 03-Jan-91 | 1.5 | 2.321 | 172 | 19.5 | 2.9 | 7.6 | 2.4 | 7.6 | 2.4 | 12.2 | 21.7 | 13.0 |
| 04-Jan-91 | 1.5 | 2.321 | 174 | 19.7 | 2.9 | 7.7 | 2.4 | 7.7 | 2.4 | 12.3 | 21.9 | 12.7 |
| 05-Jan-91 | 1.3 | 2.011 | 180 | 23.4 | 3.2 | 9.1 | 2.9 | 9.1 | 2.9 | 14.6 | 25.9 | 12.8 |
| 06-Jan-91 | 1.5 | 2.321 | 180 | 20.4 | 2.9 | 7.9 | 2.5 | 7.9 | 2.5 | 12.7 | 22.5 | 13.0 |
| 07-Jan-91 | 2.3 | 3.559 | 180 | 13.6 | 2.3 | 5.2 | 1.6 | 5.2 | 1.6 | 8.3 | 14.8 | 12.0 |
| 08-Jan-91 | 2.7 | 4.177 | 180 | 11.8 | 2.1 | 4.4 | 1.4 | 4.4 | 1.4 | 7.1 | 12.6 | 10.7 |
| 09-Jan-91 | 3 | 4.642 | 182 | 10.8 | 2.0 | 4.0 | 1.3 | 4.0 | 1.3 | 6.5 | 11.5 | 8.7 |
| 10-Jan-91 | 3.2 | 4.951 | 212 | 11.7 | 2.1 | 4.2 | 1.3 | 4.2 | 1.3 | 6.9 | 12.2 | 7.2 |
| 11-Jan-91 | 3.5 | 5.415 | 213 | 10.8 | 2.0 | 3.9 | 1.2 | 3.9 | 1.2 | 6.3 | 11.2 | 6.7 |
| 12-Jan-91 | 4.6 | 7.117 | 891 | 32.3 | 4.1 | 9.3 | 2.9 | 9.3 | 2.9 | 14.9 | 26.4 | 8.7 |
| 13-Jan-91 | 3.6 | 5.570 | 2110 | 95.7 | 10.5 | 23.6 | 7.5 | 23.6 | 7.5 | 37.8 | 67.2 | 16.5 |
| 14-Jan-91 | 3.7 | 5.725 | 2160 | 95.3 | 10.4 | 23.4 | 7.4 | 23.4 | 7.4 | 37.5 | 66.6 | 24.1 |
| 15-Jan-91 | 2.7 | 4.177 | 2210 | 133.3 | 14.2 | 32.6 | 10.3 | 32.6 | 10.3 | 52.2 | 92.9 | 35.6 |
| 16-Jan-91 | 2.1 | 3.249 | 1540 | 119.5 | 12.8 | 31.3 | 9.9 | 31.3 | 9.9 | 50.2 | 89.3 | 44.4 |
| 17-Jan-91 | 2.1 | 3.249 | 1240 | 96.4 | 10.5 | 26.3 | 8.3 | 26.3 | 8.3 | 42.2 | 75.0 | 45.5 |
| 18-Jan-91 | 1.7 | 2.630 | 1050 | 100.8 | 11.0 | 28.4 | 9.0 | 28.4 | 9.0 | 45.6 | 81.1 | 47.6 |
| 19-Jan-91 | 1.7 | 2.630 | 885 | 85.1 | 9.4 | 24.8 | 7.8 | 24.8 | 7.8 | 39.8 | 70.7 | 44.5 |
| 20-Jan-91 | 1.5 | 2.321 | 740 | 80.7 | 9.0 | 24.3 | 7.7 | 24.3 | 7.7 | 39.0 | 69.4 | 41.7 |
| 21-Jan-91 | 1.5 | 2.321 | 532 | 58.3 | 6.7 | 18.7 | 5.9 | 18.7 | 5.9 | 30.0 | 53.3 | 38.6 |
| 22-Jan-91 | 1.5 | 2.321 | 248 | 27.7 | 3.7 | 10.1 | 3.2 | 10.1 | 3.2 | 16.3 | 29.0 | 31.3 |
| 23-Jan-91 | 1.4 | 2.166 | 194 | 23.4 | 3.2 | 8.9 | 2.8 | 8.9 | 2.8 | 14.4 | 25.5 | 24.9 |
| 24-Jan-91 | 1.4 | 2.166 | 176 | 21.3 | 3.0 | 8.3 | 2.6 | 8.3 | 2.6 | 13.3 | 23.6 | 18.5 |
| 25-Jan-91 | 1.4 | 2.166 | 176 | 21.3 | 3.0 | 8.3 | 2.6 | 8.3 | 2.6 | 13.3 | 23.6 | 14.3 |
| 26-Jan-91 | 1.2 | 1.857 | 175 | 24.6 | 3.4 | 9.6 | 3.0 | 9.6 | 3.0 | 15.4 | 27.4 | 14.1 |
| 27-Jan-91 | 1.4 | 2.166 | 177 | 21.4 | 3.0 | 8.3 | 2.6 | 8.3 | 2.6 | 13.4 | 23.7 | 13.9 |
| 28-Jan-91 | 1.3 | 2.011 | 178 | 23.1 | 3.2 | 9.0 | 2.8 | 9.0 | 2.8 | 14.5 | 25.7 | 14.2 |
| 29-Jan-91 | 1.3 | 2.011 | 240 | 30.8 | 4.0 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 15.4 |
| 30-Jan-91 | 1.5 | 2.321 | 175 | 19.9 | 2.9 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 22.0 | 14.6 |
| 31-Jan-91 | 1.6 | 2.476 | 177 | 18.9 | 2.8 | 7.3 | 2.3 | 7.3 | 2.3 | 11.7 | 20.8 | 14.2 |
| 01-Feb-91 | 1.2 | 1.857 | 173 | 24.3 | 3.3 | 9.5 | 3.0 | 9.5 | 3.0 | 15.3 | 27.1 | 14.4 |
| 02-Feb-91 | 2.4 | 3.713 | 189 | 13.7 | 2.3 | 5.1 | 1.6 | 5.1 | 1.6 | 8.3 | 14.7 | 11.9 |
| 03-Feb-91 | 2.7 | 4.177 | 568 | 35.0 | 4.4 | 11.0 | 3.5 | 11.0 | 3.5 | 17.6 | 31.3 | 13.3 |
| 04-Feb-91 | 3.4 | 5.260 | 667 | 32.7 | 4.2 | 9.9 | 3.1 | 9.9 | 3.1 | 16.0 | 28.3 | 14.3 |
| 05-Feb-91 | 2.7 | 4.177 | 1760 | 106.3 | 11.5 | 27.1 | 8.6 | 27.1 | 8.6 | 43.5 | 77.4 | 21.4 |
| 06-Feb-91 | 2 | 3.094 | 1700 | 138.3 | 14.7 | 35.6 | 11.3 | 35.6 | 11.3 | 57.1 | 101.5 | 33.6 |
| 07-Feb-91 | 1.7 | 2.630 | 989 | 95.0 | 10.4 | 27.1 | 8.6 | 27.1 | 8.6 | 43.5 | 77.3 | 40.0 |
| 08-Feb-91 | 1.5 | 2.321 | 390 | 43.0 | 5.2 | 14.6 | 4.6 | 14.6 | 4.6 | 23.4 | 41.6 | 41.9 |
| 09-Feb-91 | 1.5 | 2.321 | 173 | 19.6 | 2.9 | 7.6 | 2.4 | 7.6 | 2.4 | 12.3 | 21.8 | 34.1 |
| 10-Feb-91 | 1.3 | 2.011 | 171 | 22.3 | 3.1 | 8.7 | 2.7 | 8.7 | 2.7 | 14.0 | 24.8 | 23.3 |
| 11-Feb-91 | 1.7 | 2.630 | 172 | 17.3 | 2.6 | 6.7 | 2.1 | 6.7 | 2.1 | 10.8 | 19.2 | 15.1 |
| 12-Feb-91 | 1.8 | 2.785 | 178 | 17.0 | 2.6 | 6.5 | 2.1 | 6.5 | 2.1 | 10.5 | 18.6 | 11.9 |
| 13-Feb-91 | 2.9 | 4.487 | 325 | 19.1 | 2.8 | 6.5 | 2.1 | 6.5 | 2.1 | 10.6 | 18.7 | 11.5 |
| 14-Feb-91 | 2.4 | 3.713 | 1740 | 118.1 | 12.7 | 30.3 | 9.6 | 30.3 | 9.6 | 48.5 | 86.2 | 20.1 |
| 15-Feb-91 | 2.2 | 3.404 | 2000 | 147.9 | 15.7 | 36.9 | 11.7 | 36.9 | 11.7 | 59.1 | 105.1 | 32.2 |
| 16-Feb-91 | 1.8 | 2.785 | 1490 | 134.8 | 14.4 | 35.6 | 11.3 | 35.6 | 11.3 | 57.1 | 101.4 | 43.8 |
| 17-Feb-91 | 1.8 | 2.785 | 1280 | 115.9 | 12.5 | 31.5 | 10.0 | 31.5 | 10.0 | 50.5 | 89.8 | 53.8 |
| 18-Feb-91 | 1.5 | 2.321 | 613 | 67.0 | 7.6 | 20.9 | 6.6 | 20.9 | 6.6 | 33.6 | 59.7 | 50.1 |
| 19-Feb-91 | 5 | 7.736 | 3030 | 98.9 | 10.8 | 22.7 | 7.2 | 22.7 | 7.2 | 36.4 | 64.7 | 44.4 |
| 20-Feb-91 | 4.3 | 6.653 | 4900 | 185.1 | 19.4 | 38.8 | 12.3 | 38.8 | 12.3 | 62.2 | 110.6 | 45.7 |
| 21-Feb-91 | 2.7 | 4.177 | 4260 | 255.9 | 26.5 | 55.2 | 17.5 | 55.2 | 17.5 | 88.5 | 157.3 | 55.2 |
| 22-Feb-91 | 2 | 3.094 | 3980 | 322.5 | 33.2 | 70.6 | 22.3 | 70.6 | 22.3 | 113.0 | 201.0 | 75.0 |
| 23-Feb-91 | 1.7 | 2.630 | 3690 | 351.7 | 36.1 | 78.1 | 24.7 | 78.1 | 24.7 | 125.1 | 222.5 | 97.2 |
| 24-Feb-91 | 1.7 | 2.630 | 2420 | 231.0 | 24.0 | 55.7 | 17.6 | 55.7 | 17.6 | 89.1 | 158.5 | 103.9 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mgN/L WLA=WQS*DF-Ca*(DF-1) | | WLA Running Averages for 4-day Averaging Period |
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs): | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mgN/L) | Acute (mgN/L) | Chronic (mgN/L) |
| 25-Feb-91 | 1.5 | 2.321 | 1810 | 196.0 | 20.5 | 49.9 | 15.8 | 49.9 | 15.8 | 80.0 | 142.2 | 101.8 |
| 26-Feb-91 | 1.5 | 2.321 | 1640 | 177.7 | 18.7 | 46.1 | 14.6 | 46.1 | 14.6 | 73.9 | 131.4 | 92.0 |
| 27-Feb-91 | 1.5 | 2.321 | 1380 | 149.7 | 15.9 | 40.1 | 12.7 | 40.1 | 12.7 | 64.3 | 114.4 | 76.8 |
| 28-Feb-91 | 1.4 | 2.166 | 433 | 51.0 | 6.0 | 17.0 | 5.4 | 17.0 | 5.4 | 27.2 | 48.4 | 61.4 |
| 01-Mar-91 | 1.7 | 2.630 | 686 | 66.2 | 7.5 | 20.2 | 6.4 | 20.2 | 6.4 | 32.4 | 57.6 | 49.5 |
| 02-Mar-91 | 2.3 | 3.559 | 610 | 43.9 | 5.3 | 13.6 | 4.3 | 13.6 | 4.3 | 21.9 | 38.9 | 36.5 |
| 03-Mar-91 | 2.7 | 4.177 | 505 | 31.2 | 4.0 | 10.0 | 3.2 | 10.0 | 3.2 | 16.1 | 28.5 | 24.4 |
| 04-Mar-91 | 3.3 | 5.106 | 620 | 31.4 | 4.0 | 9.6 | 3.0 | 9.6 | 3.0 | 15.5 | 27.5 | 21.5 |
| 05-Mar-91 | 2.4 | 3.713 | 344 | 24.2 | 3.3 | 8.3 | 2.6 | 8.3 | 2.6 | 13.3 | 23.6 | 16.7 |
| 06-Mar-91 | 2.1 | 3.249 | 210 | 17.2 | 2.6 | 6.4 | 2.0 | 6.4 | 2.0 | 10.3 | 18.2 | 13.8 |
| 07-Mar-91 | 1.9 | 2.940 | 160 | 14.6 | 2.4 | 5.7 | 1.8 | 5.7 | 1.8 | 9.2 | 16.2 | 12.1 |
| 08-Mar-91 | 1.9 | 2.940 | 138 | 12.7 | 2.2 | 5.0 | 1.6 | 5.0 | 1.6 | 8.2 | 14.5 | 10.2 |
| 09-Mar-91 | 2 | 3.094 | 131 | 11.6 | 2.1 | 4.6 | 1.5 | 4.6 | 1.5 | 7.5 | 13.2 | 8.8 |
| 10-Mar-91 | 1.9 | 2.940 | 155 | 14.2 | 2.3 | 5.5 | 1.7 | 5.5 | 1.7 | 8.9 | 15.8 | 8.4 |
| 11-Mar-91 | 2.4 | 3.713 | 135 | 10.1 | 1.9 | 3.9 | 1.2 | 3.9 | 1.2 | 6.4 | 11.3 | 7.7 |
| 12-Mar-91 | 2.7 | 4.177 | 180 | 11.8 | 2.1 | 4.4 | 1.4 | 4.4 | 1.4 | 7.1 | 12.6 | 7.5 |
| 13-Mar-91 | 2.2 | 3.404 | 144 | 11.6 | 2.1 | 4.5 | 1.4 | 4.5 | 1.4 | 7.3 | 13.0 | 7.5 |
| 14-Mar-91 | 2 | 3.094 | 143 | 12.6 | 2.2 | 4.9 | 1.6 | 4.9 | 1.6 | 8.0 | 14.1 | 7.2 |
| 15-Mar-91 | 1.7 | 2.630 | 139 | 14.2 | 2.3 | 5.7 | 1.8 | 5.7 | 1.8 | 9.2 | 16.2 | 7.9 |
| 16-Mar-91 | 1.6 | 2.476 | 145 | 15.6 | 2.5 | 6.2 | 2.0 | 6.2 | 2.0 | 10.0 | 17.8 | 8.6 |
| 17-Mar-91 | 1.5 | 2.321 | 143 | 16.4 | 2.5 | 6.5 | 2.1 | 6.5 | 2.1 | 10.6 | 18.7 | 9.4 |
| 18-Mar-91 | 1.7 | 2.630 | 142 | 14.5 | 2.3 | 5.8 | 1.8 | 5.8 | 1.8 | 9.3 | 16.5 | 9.8 |
| 19-Mar-91 | 1.6 | 2.476 | 147 | 15.8 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.1 | 18.0 | 10.0 |
| 20-Mar-91 | 1.5 | 2.321 | 144 | 16.5 | 2.6 | 6.6 | 2.1 | 6.6 | 2.1 | 10.6 | 18.8 | 10.2 |
| 21-Mar-91 | 1.5 | 2.321 | 142 | 16.3 | 2.5 | 6.5 | 2.1 | 6.5 | 2.1 | 10.5 | 18.6 | 10.2 |
| 22-Mar-91 | 1.5 | 2.321 | 142 | 16.3 | 2.5 | 6.5 | 2.1 | 6.5 | 2.1 | 10.5 | 18.6 | 10.5 |
| 23-Mar-91 | 1.3 | 2.011 | 136 | 17.9 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.7 | 20.7 | 10.8 |
| 24-Mar-91 | 1.7 | 2.630 | 142 | 14.5 | 2.3 | 5.8 | 1.8 | 5.8 | 1.8 | 9.3 | 16.5 | 10.5 |
| 25-Mar-91 | 1.7 | 2.630 | 143 | 14.6 | 2.4 | 5.8 | 1.8 | 5.8 | 1.8 | 9.4 | 16.5 | 10.2 |
| 26-Mar-91 | 1.6 | 2.476 | 138 | 14.9 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.7 | 17.1 | 10.0 |
| 27-Mar-91 | 1.4 | 2.166 | 139 | 17.0 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.1 | 19.6 | 9.8 |
| 28-Mar-91 | 1.5 | 2.321 | 141 | 16.2 | 2.5 | 6.5 | 2.0 | 6.5 | 2.0 | 10.5 | 18.5 | 10.1 |
| 29-Mar-91 | 1.3 | 2.011 | 138 | 18.2 | 2.7 | 7.3 | 2.3 | 7.3 | 2.3 | 11.8 | 21.0 | 10.8 |
| 30-Mar-91 | 1.3 | 2.011 | 137 | 18.0 | 2.7 | 7.3 | 2.3 | 7.3 | 2.3 | 11.8 | 20.9 | 11.3 |
| 31-Mar-91 | 1.2 | 1.857 | 144 | 20.4 | 2.9 | 8.2 | 2.6 | 8.2 | 2.6 | 13.2 | 23.5 | 11.8 |
| 01-Apr-91 | 1.4 | 2.166 | 138 | 16.9 | 2.6 | 6.8 | 2.2 | 6.8 | 2.2 | 11.0 | 19.5 | 12.0 |
| 02-Apr-91 | 1.4 | 2.166 | 141 | 17.3 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.2 | 19.8 | 11.8 |
| 03-Apr-91 | 2.3 | 3.559 | 139 | 10.8 | 2.0 | 4.2 | 1.3 | 4.2 | 1.3 | 6.8 | 12.1 | 10.6 |
| 04-Apr-91 | 5.1 | 7.891 | 647 | 21.5 | 3.0 | 6.5 | 2.0 | 6.5 | 2.0 | 10.5 | 18.5 | 9.9 |
| 05-Apr-91 | 4.7 | 7.272 | 3040 | 105.5 | 11.5 | 24.2 | 7.7 | 24.2 | 7.7 | 38.8 | 69.0 | 16.8 |
| 06-Apr-91 | 3.1 | 4.796 | 3120 | 163.6 | 17.3 | 37.5 | 11.8 | 37.5 | 11.8 | 60.0 | 106.7 | 29.0 |
| 07-Apr-91 | 2.3 | 3.559 | 1560 | 110.6 | 12.0 | 28.9 | 9.1 | 28.9 | 9.1 | 46.4 | 82.4 | 38.9 |
| 08-Apr-91 | 2.9 | 4.487 | 1390 | 78.4 | 8.7 | 20.9 | 6.6 | 20.9 | 6.6 | 33.6 | 59.6 | 44.7 |
| 09-Apr-91 | 3 | 4.642 | 1360 | 74.3 | 8.3 | 19.9 | 6.3 | 19.9 | 6.3 | 31.9 | 56.6 | 43.0 |
| 10-Apr-91 | 3.2 | 4.951 | 1210 | 62.1 | 7.1 | 17.0 | 5.4 | 17.0 | 5.4 | 27.2 | 48.4 | 34.8 |
| 11-Apr-91 | 2.3 | 3.559 | 961 | 68.5 | 7.8 | 19.6 | 6.2 | 19.6 | 6.2 | 31.5 | 55.9 | 31.0 |
| 12-Apr-91 | 1.9 | 2.940 | 894 | 77.0 | 8.6 | 22.4 | 7.1 | 22.4 | 7.1 | 35.9 | 63.8 | 31.6 |
| 13-Apr-91 | 1.6 | 2.476 | 872 | 89.1 | 9.8 | 26.0 | 8.2 | 26.0 | 8.2 | 41.8 | 74.2 | 34.1 |
| 14-Apr-91 | 1.7 | 2.630 | 864 | 83.1 | 9.2 | 24.3 | 7.7 | 24.3 | 7.7 | 39.0 | 69.3 | 37.0 |
| 15-Apr-91 | 1.7 | 2.630 | 870 | 83.7 | 9.3 | 24.5 | 7.7 | 24.5 | 7.7 | 39.2 | 69.7 | 39.0 |
| 16-Apr-91 | 1.6 | 2.476 | 880 | 89.9 | 9.9 | 26.2 | 8.3 | 26.2 | 8.3 | 42.1 | 74.7 | 40.5 |
| 17-Apr-91 | 1.4 | 2.166 | 796 | 92.9 | 10.2 | 27.6 | 8.7 | 27.6 | 8.7 | 44.3 | 78.8 | 41.2 |
| 18-Apr-91 | 1.7 | 2.630 | 657 | 63.4 | 7.2 | 19.5 | 6.2 | 19.5 | 6.2 | 31.3 | 55.7 | 39.2 |
| 19-Apr-91 | 1.4 | 2.166 | 635 | 74.3 | 8.3 | 23.1 | 7.3 | 23.1 | 7.3 | 37.0 | 65.7 | 38.7 |
| 20-Apr-91 | 1.3 | 2.011 | 631 | 79.4 | 8.8 | 24.7 | 7.8 | 24.7 | 7.8 | 39.6 | 70.4 | 38.1 |
| 21-Apr-91 | 1.3 | 2.011 | 639 | 80.4 | 8.9 | 25.0 | 7.9 | 25.0 | 7.9 | 40.0 | 71.1 | 37.0 |
| 22-Apr-91 | 1.5 | 2.321 | 683 | 74.6 | 8.4 | 22.8 | 7.2 | 22.8 | 7.2 | 36.6 | 65.1 | 38.3 |
| 23-Apr-91 | 1 | 1.547 | 690 | 112.5 | 12.1 | 34.5 | 10.9 | 34.5 | 10.9 | 55.3 | 98.2 | 42.9 |
| 24-Apr-91 | 1 | 1.547 | 704 | 114.8 | 12.4 | 35.0 | 11.1 | 35.0 | 11.1 | 56.2 | 99.8 | 47.0 |
| 25-Apr-91 | 1 | 1.547 | 632 | 103.1 | 11.2 | 32.1 | 10.2 | 32.1 | 10.2 | 51.5 | 91.6 | 49.9 |
| 26-Apr-91 | 1 | 1.547 | 598 | 97.6 | 10.7 | 30.7 | 9.7 | 30.7 | 9.7 | 49.3 | 87.6 | 53.1 |
| 27-Apr-91 | 0.9 | 1.392 | 569 | 103.2 | 11.2 | 32.8 | 10.4 | 32.8 | 10.4 | 52.6 | 93.5 | 52.4 |
| 28-Apr-91 | 1 | 1.547 | 552 | 90.2 | 9.9 | 28.8 | 9.1 | 28.8 | 9.1 | 46.2 | 82.1 | 49.9 |
| 29-Apr-91 | 1 | 1.547 | 578 | 94.4 | 10.3 | 29.9 | 9.5 | 29.9 | 9.5 | 48.0 | 85.2 | 49.0 |
| 30-Apr-91 | 0.8 | 1.238 | 557 | 113.5 | 12.3 | 36.3 | 11.5 | 36.3 | 11.5 | 58.2 | 103.4 | 51.2 |
| 01-Nov-91 | 0.6 | 0.928 | 136 | 37.6 | 4.7 | 15.6 | 4.9 | 15.6 | 4.7 | 25.1 | 42.1 | |
| 02-Nov-91 | 0.5 | 0.774 | 132 | 43.7 | 5.3 | 18.3 | 5.8 | 18.3 | 5.3 | 29.3 | 47.5 | |
| 03-Nov-91 | 0.5 | 0.774 | 132 | 43.7 | 5.3 | 18.3 | 5.8 | 18.3 | 5.3 | 29.3 | 47.5 | |
| 04-Nov-91 | 1.1 | 1.702 | 139 | 21.4 | 3.0 | 8.7 | 2.8 | 8.7 | 2.8 | 14.0 | 24.9 | 24.4 |
| 05-Nov-91 | 0.7 | 1.083 | 557 | 129.6 | 13.9 | 41.5 | 13.1 | 41.5 | 13.1 | 66.4 | 118.1 | 34.8 |
| 06-Nov-91 | 0.6 | 0.928 | 204 | 55.9 | 6.5 | 21.6 | 6.8 | 21.6 | 6.5 | 34.6 | 58.5 | 36.1 |
| 07-Nov-91 | 0.6 | 0.928 | 129 | 35.7 | 4.5 | 15.0 | 4.7 | 15.0 | 4.5 | 24.0 | 40.4 | 34.8 |
| 08-Nov-91 | 0.8 | 1.238 | 141 | 29.5 | 3.8 | 12.1 | 3.8 | 12.1 | 3.8 | 19.4 | 34.4 | 36.1 |
| 09-Nov-91 | 0.7 | 1.083 | 132 | 31.5 | 4.0 | 13.1 | 4.1 | 13.1 | 4.0 | 21.0 | 36.5 | 24.8 |
| 10-Nov-91 | 0.7 | 1.083 | 137 | 32.6 | 4.2 | 13.5 | 4.3 | 13.5 | 4.2 | 21.6 | 37.6 | 21.5 |
| 11-Nov-91 | 1.3 | 2.011 | 143 | 18.8 | 2.8 | 7.5 | 2.4 | 7.5 | 2.4 | 12.2 | 21.6 | 18.6 |
| 12-Nov-91 | 0.9 | 1.392 | 139 | 26.0 | 3.5 | 10.6 | 3.4 | 10.6 | 3.4 | 17.1 | 30.3 | 18.0 |
| 13-Nov-91 | 0.9 | 1.392 | 149 | 27.8 | 3.7 | 11.2 | 3.5 | 11.2 | 3.5 | 18.1 | 32.0 | 17.2 |
| 14-Nov-91 | 0.7 | 1.083 | 141 | 33.5 | 4.3 | 13.8 | 4.4 | 13.8 | 4.3 | 22.1 | 38.4 | 17.4 |
| 15-Nov-91 | 0.7 | 1.083 | 134 | 31.9 | 4.1 | 13.2 | 4.2 | 13.2 | 4.1 | 21.3 | 36.9 | 19.6 |
| 16-Nov-91 | 0.9 | 1.392 | 137 | 25.6 | 3.5 | 10.5 | 3.3 | 10.5 | 3.3 | 16.9 | 30.0 | 19.6 |
| 17-Nov-91 | 1 | 1.547 | 180 | 30.1 | 3.9 | 11.8 | 3.7 | 11.8 | 3.7 | 18.9 | 33.5 | 19.8 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season.

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mg/NL, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs): | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mg/NL) | Acute (mg/NL) | Chronic (mg/NL) |
| 18-Nov-91 | 1 | 1.547 | 149 | 25.1 | 3.4 | 10.1 | 3.2 | 10.1 | 3.2 | 16.3 | 28.9 | 18.3 |
| 19-Nov-91 | 1.1 | 1.702 | 143 | 22.0 | 3.1 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.4 | 16.6 |
| 20-Nov-91 | 1.6 | 2.476 | 695 | 71.2 | 8.0 | 21.7 | 6.9 | 21.7 | 6.9 | 34.8 | 61.9 | 21.1 |
| 21-Nov-91 | 1 | 1.547 | 218 | 36.2 | 4.5 | 13.7 | 4.3 | 13.7 | 4.3 | 22.0 | 39.1 | 21.9 |
| 22-Nov-91 | 0.9 | 1.392 | 134 | 25.1 | 3.4 | 10.3 | 3.3 | 10.3 | 3.3 | 16.6 | 29.4 | 21.9 |
| 23-Nov-91 | 1 | 1.547 | 137 | 23.1 | 3.2 | 9.5 | 3.0 | 9.5 | 3.0 | 15.2 | 27.0 | 22.2 |
| 24-Nov-91 | 2 | 3.094 | 156 | 13.6 | 2.3 | 5.3 | 1.7 | 5.3 | 1.7 | 8.6 | 15.1 | 15.6 |
| 25-Nov-91 | 2.1 | 3.249 | 1300 | 101.0 | 11.0 | 27.4 | 8.6 | 27.4 | 8.6 | 43.9 | 77.9 | 21.1 |
| 26-Nov-91 | 2.5 | 3.868 | 1870 | 121.9 | 13.1 | 30.8 | 9.7 | 30.8 | 9.7 | 49.3 | 87.7 | 29.2 |
| 27-Nov-91 | 2 | 3.094 | 1470 | 119.8 | 12.9 | 31.7 | 10.0 | 31.7 | 10.0 | 50.8 | 90.3 | 38.1 |
| 28-Nov-91 | 1.2 | 1.857 | 1030 | 139.7 | 14.9 | 39.7 | 12.5 | 39.7 | 12.5 | 63.6 | 113.0 | 51.9 |
| 29-Nov-91 | 1.2 | 1.857 | 219 | 30.5 | 3.9 | 11.5 | 3.6 | 11.5 | 3.6 | 18.4 | 32.7 | 45.5 |
| 30-Nov-91 | 1 | 1.547 | 142 | 23.9 | 3.3 | 9.7 | 3.1 | 9.7 | 3.1 | 15.7 | 27.8 | 37.1 |
| 01-Dec-91 | 1 | 1.547 | 142 | 23.9 | 3.3 | 9.7 | 3.1 | 9.7 | 3.1 | 15.7 | 27.8 | 28.3 |
| 02-Dec-91 | 0.9 | 1.392 | 140 | 26.1 | 3.5 | 10.7 | 3.4 | 10.7 | 3.4 | 17.2 | 30.5 | 16.7 |
| 03-Dec-91 | 0.9 | 1.392 | 144 | 26.9 | 3.6 | 10.9 | 3.5 | 10.9 | 3.5 | 17.6 | 31.2 | 16.5 |
| 04-Dec-91 | 1.2 | 1.857 | 145 | 20.5 | 3.0 | 8.3 | 2.6 | 8.3 | 2.6 | 13.3 | 23.6 | 15.9 |
| 05-Dec-91 | 2 | 3.094 | 497 | 41.2 | 5.0 | 13.3 | 4.2 | 13.3 | 4.2 | 21.4 | 37.9 | 17.4 |
| 06-Dec-91 | 2.5 | 3.868 | 1370 | 89.5 | 9.9 | 24.0 | 7.6 | 24.0 | 7.6 | 38.5 | 68.3 | 22.7 |
| 07-Dec-91 | 1.8 | 2.785 | 1610 | 145.5 | 15.5 | 37.9 | 12.0 | 37.9 | 12.0 | 60.7 | 107.9 | 33.5 |
| 08-Dec-91 | 1.4 | 2.166 | 1570 | 182.2 | 19.1 | 47.7 | 15.1 | 47.7 | 15.1 | 76.4 | 135.9 | 49.2 |
| 09-Dec-91 | 1.3 | 2.011 | 2300 | 286.9 | 29.6 | 69.8 | 22.1 | 69.8 | 22.1 | 111.9 | 198.9 | 71.9 |
| 10-Dec-91 | 1.1 | 1.702 | 2080 | 306.5 | 31.6 | 76.1 | 24.1 | 76.1 | 24.1 | 121.9 | 216.8 | 92.7 |
| 11-Dec-91 | 1.1 | 1.702 | 1310 | 193.4 | 20.2 | 52.5 | 16.6 | 52.5 | 16.6 | 84.1 | 149.5 | 98.6 |
| 12-Dec-91 | 1.1 | 1.702 | 1070 | 158.2 | 16.7 | 44.6 | 14.1 | 44.6 | 14.1 | 71.5 | 127.1 | 97.3 |
| 13-Dec-91 | 0.9 | 1.392 | 963 | 173.9 | 18.3 | 50.1 | 15.8 | 50.1 | 15.8 | 80.2 | 142.6 | 89.4 |
| 14-Dec-91 | 0.9 | 1.392 | 370 | 67.4 | 7.6 | 23.2 | 7.3 | 23.2 | 7.3 | 37.3 | 66.2 | 68.3 |
| 15-Dec-91 | 0.9 | 1.392 | 188 | 34.8 | 4.4 | 13.5 | 4.3 | 13.5 | 4.3 | 21.7 | 38.5 | 52.7 |
| 16-Dec-91 | 0.9 | 1.392 | 174 | 32.2 | 4.1 | 12.7 | 4.0 | 12.7 | 4.0 | 20.4 | 36.2 | 39.9 |
| 17-Dec-91 | 0.8 | 1.238 | 155 | 32.3 | 4.1 | 13.0 | 4.1 | 13.0 | 4.1 | 20.9 | 37.1 | 25.1 |
| 18-Dec-91 | 0.8 | 1.238 | 137 | 28.7 | 3.8 | 11.8 | 3.7 | 11.8 | 3.7 | 19.0 | 33.7 | 20.5 |
| 19-Dec-91 | 0.8 | 1.238 | 137 | 28.7 | 3.8 | 11.8 | 3.7 | 11.8 | 3.7 | 19.0 | 33.7 | 19.8 |
| 20-Dec-91 | 1 | 1.547 | 134 | 22.7 | 3.2 | 9.3 | 2.9 | 9.3 | 2.9 | 15.0 | 26.5 | 18.5 |
| 21-Dec-91 | 1.3 | 2.011 | 150 | 19.6 | 2.9 | 7.8 | 2.5 | 7.8 | 2.5 | 12.6 | 22.4 | 16.4 |
| 22-Dec-91 | 1 | 1.547 | 139 | 23.5 | 3.2 | 9.6 | 3.0 | 9.6 | 3.0 | 15.4 | 27.3 | 15.5 |
| 23-Dec-91 | 1 | 1.547 | 135 | 22.8 | 3.2 | 9.3 | 3.0 | 9.3 | 3.0 | 15.0 | 26.7 | 14.5 |
| 24-Dec-91 | 1 | 1.547 | 133 | 22.5 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.9 | 26.4 | 14.5 |
| 25-Dec-91 | 0.8 | 1.238 | 137 | 28.7 | 3.8 | 11.8 | 3.7 | 11.8 | 3.7 | 19.0 | 33.7 | 16.1 |
| 26-Dec-91 | 1 | 1.547 | 496 | 81.1 | 9.0 | 26.5 | 8.4 | 26.5 | 8.4 | 42.4 | 75.4 | 22.8 |
| 27-Dec-91 | 0.9 | 1.392 | 760 | 137.4 | 14.6 | 41.4 | 13.1 | 41.4 | 13.1 | 66.3 | 117.9 | 35.7 |
| 28-Dec-91 | 0.9 | 1.392 | 139 | 26.0 | 3.5 | 10.6 | 3.4 | 10.6 | 3.4 | 17.1 | 30.3 | 36.2 |
| 29-Dec-91 | 0.9 | 1.392 | 137 | 25.6 | 3.5 | 10.5 | 3.3 | 10.5 | 3.3 | 16.9 | 30.0 | 35.7 |
| 30-Dec-91 | 0.9 | 1.392 | 136 | 25.4 | 3.4 | 10.4 | 3.3 | 10.4 | 3.3 | 16.8 | 29.8 | 29.3 |
| 31-Dec-91 | 0.9 | 1.392 | 137 | 25.6 | 3.5 | 10.5 | 3.3 | 10.5 | 3.3 | 16.9 | 30.0 | 16.9 |
| 01-Jan-92 | 1 | 1.547 | 135 | 22.8 | 3.2 | 9.3 | 3.0 | 9.3 | 3.0 | 15.0 | 26.7 | 16.4 |
| 02-Jan-92 | 1.1 | 1.702 | 141 | 21.7 | 3.1 | 8.8 | 2.8 | 8.8 | 2.8 | 14.2 | 25.1 | 15.7 |
| 03-Jan-92 | 1.1 | 1.702 | 139 | 21.4 | 3.0 | 8.7 | 2.8 | 8.7 | 2.8 | 14.0 | 24.9 | 15.0 |
| 04-Jan-92 | 1.1 | 1.702 | 144 | 22.2 | 3.1 | 8.9 | 2.8 | 8.9 | 2.8 | 14.4 | 25.6 | 14.4 |
| 05-Jan-92 | 1 | 1.547 | 135 | 22.8 | 3.2 | 9.3 | 3.0 | 9.3 | 3.0 | 15.0 | 26.7 | 14.4 |
| 06-Jan-92 | 0.9 | 1.392 | 132 | 24.7 | 3.4 | 10.2 | 3.2 | 10.2 | 3.2 | 16.4 | 29.1 | 15.0 |
| 07-Jan-92 | 0.8 | 1.238 | 129 | 27.1 | 3.6 | 11.2 | 3.6 | 11.2 | 3.6 | 18.1 | 32.1 | 16.0 |
| 08-Jan-92 | 0.8 | 1.238 | 138 | 28.9 | 3.8 | 11.9 | 3.8 | 11.9 | 3.8 | 19.1 | 33.9 | 17.2 |
| 09-Jan-92 | 0.8 | 1.238 | 141 | 29.5 | 3.8 | 12.1 | 3.8 | 12.1 | 3.8 | 19.4 | 34.4 | 18.2 |
| 10-Jan-92 | 1.1 | 1.702 | 141 | 21.7 | 3.1 | 8.8 | 2.8 | 8.8 | 2.8 | 14.2 | 25.1 | 17.7 |
| 11-Jan-92 | 0.7 | 1.083 | 137 | 32.6 | 4.2 | 13.5 | 4.3 | 13.5 | 4.2 | 21.6 | 37.6 | 18.6 |
| 12-Jan-92 | 0.7 | 1.083 | 139 | 33.1 | 4.2 | 13.6 | 4.3 | 13.6 | 4.2 | 21.9 | 38.0 | 19.3 |
| 13-Jan-92 | 1.2 | 1.857 | 134 | 19.0 | 2.8 | 7.8 | 2.5 | 7.8 | 2.5 | 12.5 | 22.2 | 17.6 |
| 14-Jan-92 | 0.8 | 1.238 | 129 | 27.1 | 3.6 | 11.2 | 3.6 | 11.2 | 3.6 | 18.1 | 32.1 | 18.5 |
| 15-Jan-92 | 1.3 | 2.011 | 131 | 17.3 | 2.6 | 7.0 | 2.2 | 7.0 | 2.2 | 11.4 | 20.1 | 16.0 |
| 16-Jan-92 | 1.6 | 2.476 | 162 | 17.4 | 2.6 | 6.8 | 2.1 | 6.8 | 2.1 | 11.0 | 19.4 | 13.2 |
| 17-Jan-92 | 1.1 | 1.702 | 135 | 20.8 | 3.0 | 8.5 | 2.7 | 8.5 | 2.7 | 13.7 | 24.3 | 13.5 |
| 18-Jan-92 | 1 | 1.547 | 143 | 24.1 | 3.3 | 9.8 | 3.1 | 9.8 | 3.1 | 15.7 | 27.9 | 12.9 |
| 19-Jan-92 | 1 | 1.547 | 140 | 23.6 | 3.3 | 9.6 | 3.0 | 9.6 | 3.0 | 15.5 | 27.5 | 14.0 |
| 20-Jan-92 | 1 | 1.547 | 144 | 24.3 | 3.3 | 9.8 | 3.1 | 9.8 | 3.1 | 15.8 | 28.1 | 15.2 |
| 21-Jan-92 | 0.9 | 1.392 | 141 | 26.3 | 3.5 | 10.7 | 3.4 | 10.7 | 3.4 | 17.3 | 30.7 | 16.1 |
| 22-Jan-92 | 1.3 | 2.011 | 249 | 31.9 | 4.1 | 11.7 | 3.7 | 11.7 | 3.7 | 18.9 | 33.5 | 16.9 |
| 23-Jan-92 | 2 | 3.094 | 168 | 14.6 | 2.4 | 5.6 | 1.8 | 5.6 | 1.8 | 9.1 | 16.0 | 15.3 |
| 24-Jan-92 | 1.4 | 2.166 | 288 | 34.2 | 4.3 | 12.2 | 3.9 | 12.2 | 3.9 | 19.7 | 34.9 | 16.2 |
| 25-Jan-92 | 1.3 | 2.011 | 139 | 18.3 | 2.7 | 7.4 | 2.3 | 7.4 | 2.3 | 11.9 | 21.1 | 14.9 |
| 26-Jan-92 | 1.3 | 2.011 | 144 | 18.9 | 2.8 | 7.6 | 2.4 | 7.6 | 2.4 | 12.2 | 21.7 | 13.2 |
| 27-Jan-92 | 3.6 | 5.570 | 170 | 8.6 | 1.8 | 3.2 | 1.0 | 3.2 | 1.0 | 5.2 | 9.1 | 12.3 |
| 28-Jan-92 | 3.3 | 5.106 | 1110 | 55.4 | 6.4 | 15.4 | 4.9 | 15.4 | 4.9 | 24.7 | 43.8 | 13.5 |
| 29-Jan-92 | 2.9 | 4.487 | 2140 | 120.2 | 12.9 | 29.6 | 9.4 | 29.6 | 9.4 | 47.4 | 84.3 | 22.4 |
| 30-Jan-92 | 3.7 | 5.725 | 1980 | 87.5 | 9.6 | 21.8 | 6.9 | 21.8 | 6.9 | 35.0 | 62.1 | 28.1 |
| 31-Jan-92 | 1.6 | 2.476 | 1520 | 154.5 | 16.4 | 40.7 | 12.9 | 40.7 | 12.9 | 65.2 | 115.9 | 43.1 |
| 01-Feb-92 | 1.4 | 2.166 | 1270 | 147.6 | 15.7 | 40.2 | 12.7 | 40.2 | 12.7 | 64.5 | 114.6 | 53.0 |
| 02-Feb-92 | 1.3 | 2.011 | 1140 | 142.7 | 15.2 | 39.7 | 12.6 | 39.7 | 12.6 | 63.7 | 113.2 | 57.1 |
| 03-Feb-92 | 1.2 | 1.857 | 548 | 74.8 | 8.4 | 23.9 | 7.6 | 23.9 | 7.6 | 38.3 | 68.1 | 57.9 |
| 04-Feb-92 | 1 | 1.547 | 136 | 23.0 | 3.2 | 9.4 | 3.0 | 9.4 | 3.0 | 15.1 | 26.8 | 45.4 |
| 05-Feb-92 | 1 | 1.547 | 128 | 21.7 | 3.1 | 9.0 | 2.8 | 9.0 | 2.8 | 14.4 | 25.6 | 32.9 |
| 06-Feb-92 | 1 | 1.547 | 121 | 20.6 | 3.0 | 8.6 | 2.7 | 8.6 | 2.7 | 13.8 | 24.5 | 20.4 |
| 07-Feb-92 | 1 | 1.547 | 117 | 19.9 | 2.9 | 8.3 | 2.6 | 8.3 | 2.6 | 13.4 | 23.8 | 14.2 |
| 08-Feb-92 | 0.9 | 1.392 | 116 | 21.8 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.8 | 26.3 | 14.1 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mgN/L. WLA=WQS*DF-Ca*(DF-1) | | WLA Running Averages for 4-day Averaging Period |
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs): | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mgN/L) | Acute (mgN/L) | Chronic (mgN/L) |
| 09-Feb-92 | 0.9 | 1.392 | 116 | 21.8 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.8 | 26.3 | 14.2 |
| 10-Feb-92 | 1 | 1.547 | 117 | 19.9 | 2.9 | 8.3 | 2.6 | 8.3 | 2.6 | 13.4 | 23.8 | 14.1 |
| 11-Feb-92 | 0.8 | 1.238 | 113 | 23.8 | 3.3 | 10.1 | 3.2 | 10.1 | 3.2 | 16.3 | 28.9 | 14.8 |
| 12-Feb-92 | 0.7 | 1.083 | 110 | 26.4 | 3.5 | 11.3 | 3.6 | 11.3 | 3.5 | 18.2 | 32.0 | 15.7 |
| 13-Feb-92 | 0.9 | 1.392 | 111 | 20.9 | 3.0 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.4 | 15.6 |
| 14-Feb-92 | 1.4 | 2.166 | 114 | 14.2 | 2.3 | 5.9 | 1.9 | 5.9 | 1.9 | 9.5 | 16.8 | 14.6 |
| 15-Feb-92 | 1.3 | 2.011 | 143 | 18.8 | 2.8 | 7.5 | 2.4 | 7.5 | 2.4 | 12.2 | 21.6 | 13.5 |
| 16-Feb-92 | 1.1 | 1.702 | 120 | 18.6 | 2.8 | 7.7 | 2.4 | 7.7 | 2.4 | 12.5 | 22.1 | 12.1 |
| 17-Feb-92 | 1 | 1.547 | 118 | 20.1 | 2.9 | 8.4 | 2.7 | 8.4 | 2.7 | 13.5 | 24.0 | 11.9 |
| 18-Feb-92 | 1.6 | 2.476 | 132 | 14.3 | 2.3 | 5.8 | 1.8 | 5.8 | 1.8 | 9.3 | 16.5 | 11.9 |
| 19-Feb-92 | 1.5 | 2.321 | 179 | 20.3 | 2.9 | 7.8 | 2.5 | 7.8 | 2.5 | 12.6 | 22.4 | 12.0 |
| 20-Feb-92 | 2 | 3.094 | 162 | 14.1 | 2.3 | 5.4 | 1.7 | 5.4 | 1.7 | 8.8 | 15.6 | 11.1 |
| 21-Feb-92 | 2.6 | 4.023 | 171 | 11.6 | 2.1 | 4.4 | 1.4 | 4.4 | 1.4 | 7.1 | 12.6 | 9.5 |
| 22-Feb-92 | 1.9 | 2.940 | 305 | 26.9 | 3.6 | 9.5 | 3.0 | 9.5 | 3.0 | 15.2 | 27.0 | 10.9 |
| 23-Feb-92 | 1.4 | 2.166 | 242 | 28.9 | 3.8 | 10.7 | 3.4 | 10.7 | 3.4 | 17.1 | 30.4 | 12.1 |
| 24-Feb-92 | 1.3 | 2.011 | 144 | 18.9 | 2.8 | 7.6 | 2.4 | 7.6 | 2.4 | 12.2 | 21.7 | 12.9 |
| 25-Feb-92 | 1.2 | 1.857 | 135 | 19.2 | 2.8 | 7.8 | 2.5 | 7.8 | 2.5 | 12.6 | 22.3 | 14.3 |
| 26-Feb-92 | 1 | 1.547 | 466 | 76.3 | 8.5 | 25.2 | 8.0 | 25.2 | 8.0 | 40.4 | 71.7 | 20.6 |
| 27-Feb-92 | 1 | 1.547 | 511 | 83.6 | 9.3 | 27.1 | 8.6 | 27.1 | 8.6 | 43.5 | 77.2 | 27.2 |
| 28-Feb-92 | 0.9 | 1.392 | 123 | 23.1 | 3.2 | 9.6 | 3.0 | 9.6 | 3.0 | 15.5 | 27.5 | 28.0 |
| 29-Feb-92 | 0.9 | 1.392 | 119 | 22.4 | 3.1 | 9.4 | 3.0 | 9.4 | 3.0 | 15.1 | 26.8 | 28.6 |
| 01-Mar-92 | 0.9 | 1.392 | 117 | 22.0 | 3.1 | 9.3 | 2.9 | 9.3 | 2.9 | 14.9 | 26.4 | 22.2 |
| 02-Mar-92 | 0.9 | 1.392 | 113 | 21.3 | 3.0 | 9.0 | 2.8 | 9.0 | 2.8 | 14.5 | 25.7 | 15.0 |
| 03-Mar-92 | 1 | 1.547 | 118 | 20.1 | 2.9 | 8.4 | 2.7 | 8.4 | 2.7 | 13.5 | 24.0 | 14.5 |
| 04-Mar-92 | 1 | 1.547 | 115 | 19.6 | 2.9 | 8.2 | 2.6 | 8.2 | 2.6 | 13.3 | 23.5 | 14.1 |
| 05-Mar-92 | 1 | 1.547 | 127 | 21.5 | 3.1 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.4 | 13.9 |
| 06-Mar-92 | 1 | 1.547 | 135 | 22.8 | 3.2 | 9.3 | 3.0 | 9.3 | 3.0 | 15.0 | 26.7 | 14.0 |
| 07-Mar-92 | 0.9 | 1.392 | 130 | 24.3 | 3.3 | 10.1 | 3.2 | 10.1 | 3.2 | 16.2 | 28.7 | 14.7 |
| 08-Mar-92 | 0.9 | 1.392 | 130 | 24.3 | 3.3 | 10.1 | 3.2 | 10.1 | 3.2 | 16.2 | 28.7 | 15.4 |
| 09-Mar-92 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 16.4 |
| 10-Mar-92 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 17.3 |
| 11-Mar-92 | 0.7 | 1.083 | 130 | 31.0 | 4.0 | 12.9 | 4.1 | 12.9 | 4.0 | 20.8 | 36.1 | 18.4 |
| 12-Mar-92 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 18.9 |
| 13-Mar-92 | 0.8 | 1.238 | 136 | 28.5 | 3.7 | 11.7 | 3.7 | 11.7 | 3.7 | 18.9 | 33.5 | 19.1 |
| 14-Mar-92 | 0.9 | 1.392 | 134 | 25.1 | 3.4 | 10.3 | 3.3 | 10.3 | 3.3 | 16.6 | 29.4 | 18.6 |
| 15-Mar-92 | 1.1 | 1.702 | 140 | 21.6 | 3.1 | 8.8 | 2.8 | 8.8 | 2.8 | 14.1 | 25.0 | 17.0 |
| 16-Mar-92 | 1.2 | 1.857 | 138 | 19.6 | 2.9 | 7.9 | 2.5 | 7.9 | 2.5 | 12.8 | 22.7 | 15.6 |
| 17-Mar-92 | 1.6 | 2.476 | 151 | 16.2 | 2.5 | 6.4 | 2.0 | 6.4 | 2.0 | 10.4 | 18.4 | 13.5 |
| 18-Mar-92 | 1.1 | 1.702 | 134 | 20.7 | 3.0 | 8.5 | 2.7 | 8.5 | 2.7 | 13.6 | 24.2 | 12.7 |
| 19-Mar-92 | 1 | 1.547 | 133 | 22.5 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.9 | 26.4 | 12.9 |
| 20-Mar-92 | 1 | 1.547 | 132 | 22.3 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.8 | 26.2 | 13.4 |
| 21-Mar-92 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 15.4 |
| 22-Mar-92 | 0.7 | 1.083 | 131 | 31.2 | 4.0 | 13.0 | 4.1 | 13.0 | 4.0 | 20.9 | 36.3 | 17.2 |
| 23-Mar-92 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 18.1 |
| 24-Mar-92 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 19.0 |
| 25-Mar-92 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 19.0 |
| 26-Mar-92 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 18.3 |
| 27-Mar-92 | 0.9 | 1.392 | 138 | 25.8 | 3.5 | 10.6 | 3.3 | 10.6 | 3.3 | 17.0 | 30.1 | 18.0 |
| 28-Mar-92 | 0.7 | 1.083 | 134 | 31.9 | 4.1 | 13.2 | 4.2 | 13.2 | 4.1 | 21.3 | 36.9 | 18.7 |
| 29-Mar-92 | 0.7 | 1.083 | 131 | 31.2 | 4.0 | 13.0 | 4.1 | 13.0 | 4.0 | 20.9 | 36.3 | 19.4 |
| 30-Mar-92 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 19.4 |
| 31-Mar-92 | 0.6 | 0.928 | 131 | 36.3 | 4.5 | 15.1 | 4.8 | 15.1 | 4.5 | 24.3 | 40.9 | 21.2 |
| 01-Apr-92 | 0.7 | 1.083 | 131 | 31.2 | 4.0 | 13.0 | 4.1 | 13.0 | 4.0 | 20.9 | 36.3 | 21.1 |
| 02-Apr-92 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 20.5 |
| 03-Apr-92 | 0.7 | 1.083 | 137 | 32.6 | 4.2 | 13.5 | 4.3 | 13.5 | 4.2 | 21.6 | 37.6 | 21.3 |
| 04-Apr-92 | 0.8 | 1.238 | 132 | 27.7 | 3.7 | 11.5 | 3.6 | 11.5 | 3.6 | 18.4 | 32.7 | 19.8 |
| 05-Apr-92 | 0.7 | 1.083 | 135 | 32.2 | 4.1 | 13.3 | 4.2 | 13.3 | 4.1 | 21.4 | 37.1 | 19.9 |
| 06-Apr-92 | 0.8 | 1.238 | 138 | 28.9 | 3.8 | 11.9 | 3.8 | 11.9 | 3.8 | 19.1 | 33.9 | 20.1 |
| 07-Apr-92 | 0.7 | 1.083 | 136 | 32.4 | 4.1 | 13.4 | 4.2 | 13.4 | 4.1 | 21.5 | 37.4 | 20.1 |
| 08-Apr-92 | 0.7 | 1.083 | 134 | 31.9 | 4.1 | 13.2 | 4.2 | 13.2 | 4.1 | 21.3 | 36.9 | 20.8 |
| 09-Apr-92 | 1.2 | 1.857 | 140 | 19.9 | 2.9 | 8.0 | 2.5 | 8.0 | 2.5 | 12.9 | 22.9 | 18.7 |
| 10-Apr-92 | 1 | 1.547 | 138 | 23.3 | 3.2 | 9.5 | 3.0 | 9.5 | 3.0 | 15.3 | 27.2 | 17.8 |
| 11-Apr-92 | 0.9 | 1.392 | 133 | 24.9 | 3.4 | 10.2 | 3.2 | 10.2 | 3.2 | 16.5 | 29.3 | 16.5 |
| 12-Apr-92 | 1 | 1.547 | 134 | 22.7 | 3.2 | 9.3 | 2.9 | 9.3 | 2.9 | 15.0 | 26.5 | 14.9 |
| 13-Apr-92 | 0.9 | 1.392 | 130 | 24.3 | 3.3 | 10.1 | 3.2 | 10.1 | 3.2 | 16.2 | 28.7 | 15.7 |
| 14-Apr-92 | 0.8 | 1.238 | 130 | 27.3 | 3.6 | 11.3 | 3.6 | 11.3 | 3.6 | 18.2 | 32.3 | 16.5 |
| 15-Apr-92 | 0.9 | 1.392 | 131 | 24.5 | 3.4 | 10.1 | 3.2 | 10.1 | 3.2 | 16.3 | 28.9 | 16.4 |
| 16-Apr-92 | 1.8 | 2.785 | 138 | 13.4 | 2.2 | 5.3 | 1.7 | 5.3 | 1.7 | 8.6 | 15.2 | 14.8 |
| 17-Apr-92 | 1.8 | 2.785 | 192 | 18.2 | 2.7 | 6.9 | 2.2 | 6.9 | 2.2 | 11.2 | 19.8 | 13.6 |
| 18-Apr-92 | 1.3 | 2.011 | 304 | 38.8 | 4.8 | 13.8 | 4.4 | 13.8 | 4.4 | 22.1 | 39.3 | 14.5 |
| 19-Apr-92 | 1.1 | 1.702 | 135 | 20.8 | 3.0 | 8.5 | 2.7 | 8.5 | 2.7 | 13.7 | 24.3 | 13.9 |
| 20-Apr-92 | 1.1 | 1.702 | 150 | 23.0 | 3.2 | 9.2 | 2.9 | 9.2 | 2.9 | 14.9 | 26.4 | 15.5 |
| 21-Apr-92 | 1 | 1.547 | 149 | 25.1 | 3.4 | 10.1 | 3.2 | 10.1 | 3.2 | 16.3 | 28.9 | 16.7 |
| 22-Apr-92 | 1 | 1.547 | 148 | 24.9 | 3.4 | 10.1 | 3.2 | 10.1 | 3.2 | 16.2 | 28.7 | 15.3 |
| 23-Apr-92 | 1 | 1.547 | 145 | 24.4 | 3.3 | 9.9 | 3.1 | 9.9 | 3.1 | 15.9 | 28.2 | 15.8 |
| 24-Apr-92 | 0.9 | 1.392 | 139 | 26.0 | 3.5 | 10.6 | 3.4 | 10.6 | 3.4 | 17.1 | 30.3 | 16.4 |
| 25-Apr-92 | 0.8 | 1.238 | 137 | 28.7 | 3.8 | 11.8 | 3.7 | 11.8 | 3.7 | 19.0 | 33.7 | 17.0 |
| 26-Apr-92 | 0.9 | 1.392 | 136 | 25.4 | 3.4 | 10.4 | 3.3 | 10.4 | 3.3 | 16.8 | 29.8 | 17.2 |
| 27-Apr-92 | 1 | 1.547 | 137 | 23.1 | 3.2 | 9.5 | 3.0 | 9.5 | 3.0 | 15.2 | 27.0 | 17.0 |
| 28-Apr-92 | 1 | 1.547 | 136 | 23.0 | 3.2 | 9.4 | 3.0 | 9.4 | 3.0 | 15.1 | 26.8 | 16.5 |
| 29-Apr-92 | 1.5 | 2.321 | 237 | 26.5 | 3.6 | 9.8 | 3.1 | 9.8 | 3.1 | 15.8 | 27.9 | 15.7 |
| 30-Apr-92 | 1.1 | 1.702 | 856 | 126.7 | 13.6 | 37.3 | 11.8 | 37.3 | 11.8 | 59.8 | 106.2 | 26.5 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Contiuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mgN/L, WLA=WQS*DF-Ca*(DF-1) | | Contiuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs) | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mgN/L) | Acute (mgN/L) | Chronic (mgN/L) |
| 01-Nov-92 | 1.5 | 2.321 | 149 | 17.1 | 2.6 | 6.8 | 2.1 | 6.8 | 2.1 | 10.9 | 19.4 | |
| 02-Nov-92 | 1.2 | 1.857 | 150 | 21.2 | 3.0 | 8.5 | 2.7 | 8.5 | 2.7 | 13.7 | 24.2 | |
| 03-Nov-92 | 1.2 | 1.857 | 136 | 19.3 | 2.8 | 7.8 | 2.5 | 7.8 | 2.5 | 12.7 | 22.4 | |
| 04-Nov-92 | 1.2 | 1.857 | 147 | 20.8 | 3.0 | 8.3 | 2.6 | 8.3 | 2.6 | 13.5 | 23.9 | 12.7 |
| 05-Nov-92 | 1.1 | 1.702 | 138 | 21.3 | 3.0 | 8.7 | 2.7 | 8.7 | 2.7 | 13.9 | 24.7 | 13.4 |
| 06-Nov-92 | 1.3 | 2.011 | 139 | 18.3 | 2.7 | 7.4 | 2.3 | 7.4 | 2.3 | 11.9 | 21.1 | 13.0 |
| 07-Nov-92 | 1.3 | 2.011 | 157 | 20.5 | 3.0 | 8.1 | 2.6 | 8.1 | 2.6 | 13.1 | 23.2 | 13.1 |
| 08-Nov-92 | 2.2 | 3.404 | 190 | 15.0 | 2.4 | 5.6 | 1.8 | 5.6 | 1.8 | 9.1 | 16.1 | 12.0 |
| 09-Nov-92 | 1.5 | 2.321 | 208 | 23.4 | 3.2 | 8.8 | 2.8 | 8.8 | 2.8 | 14.2 | 25.2 | 12.1 |
| 10-Nov-92 | 1.3 | 2.011 | 162 | 21.1 | 3.0 | 8.3 | 2.6 | 8.3 | 2.6 | 13.4 | 23.8 | 12.5 |
| 11-Nov-92 | 2.2 | 3.404 | 225 | 17.5 | 2.7 | 6.4 | 2.0 | 6.4 | 2.0 | 10.4 | 18.4 | 11.8 |
| 12-Nov-92 | 1.5 | 2.321 | 338 | 37.4 | 4.6 | 13.0 | 4.1 | 13.0 | 4.1 | 20.9 | 37.1 | 14.7 |
| 13-Nov-92 | 1.3 | 2.011 | 166 | 21.6 | 3.1 | 8.5 | 2.7 | 8.5 | 2.7 | 13.7 | 24.3 | 14.6 |
| 14-Nov-92 | 1.2 | 1.857 | 156 | 22.0 | 3.1 | 8.7 | 2.8 | 8.7 | 2.8 | 14.1 | 25.0 | 14.8 |
| 15-Nov-92 | 1.2 | 1.857 | 146 | 20.7 | 3.0 | 8.3 | 2.6 | 8.3 | 2.6 | 13.4 | 23.7 | 15.5 |
| 16-Nov-92 | 1.1 | 1.702 | 144 | 22.2 | 3.1 | 8.9 | 2.8 | 8.9 | 2.8 | 14.4 | 25.6 | 13.9 |
| 17-Nov-92 | 2 | 3.094 | 153 | 13.4 | 2.2 | 5.2 | 1.6 | 5.2 | 1.6 | 8.4 | 14.9 | 12.6 |
| 18-Nov-92 | 2 | 3.094 | 165 | 14.3 | 2.3 | 5.5 | 1.7 | 5.5 | 1.7 | 8.9 | 15.8 | 11.3 |
| 19-Nov-92 | 1.9 | 2.940 | 182 | 16.5 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.1 | 18.0 | 10.5 |
| 20-Nov-92 | 1.4 | 2.166 | 166 | 20.2 | 2.9 | 7.9 | 2.5 | 7.9 | 2.5 | 12.7 | 22.6 | 10.1 |
| 21-Nov-92 | 3.2 | 4.951 | 554 | 29.0 | 3.8 | 9.1 | 2.9 | 9.1 | 2.9 | 14.6 | 25.9 | 11.6 |
| 22-Nov-92 | 1.9 | 2.940 | 1300 | 111.6 | 12.1 | 30.2 | 9.6 | 30.2 | 9.6 | 48.5 | 86.1 | 21.5 |
| 23-Nov-92 | 1.5 | 2.321 | 446 | 49.0 | 5.8 | 16.2 | 5.1 | 16.2 | 5.1 | 26.1 | 46.3 | 25.5 |
| 24-Nov-92 | 1.3 | 2.011 | 172 | 22.4 | 3.1 | 8.7 | 2.8 | 8.7 | 2.8 | 14.1 | 25.0 | 25.8 |
| 25-Nov-92 | 1.2 | 1.857 | 157 | 22.1 | 3.1 | 8.8 | 2.8 | 8.8 | 2.8 | 14.2 | 25.1 | 25.7 |
| 26-Nov-92 | 1.2 | 1.857 | 149 | 21.1 | 3.0 | 8.4 | 2.7 | 8.4 | 2.7 | 13.6 | 24.1 | 17.0 |
| 27-Nov-92 | 1.5 | 2.321 | 159 | 18.1 | 2.7 | 7.1 | 2.3 | 7.1 | 2.3 | 11.5 | 20.4 | 13.3 |
| 28-Nov-92 | 1.3 | 2.011 | 153 | 20.0 | 2.9 | 8.0 | 2.5 | 8.0 | 2.5 | 12.8 | 22.8 | 13.0 |
| 29-Nov-92 | 1.6 | 2.476 | 139 | 15.0 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.7 | 17.2 | 11.9 |
| 30-Nov-92 | 1.8 | 2.785 | 178 | 17.0 | 2.6 | 6.5 | 2.1 | 6.5 | 2.1 | 10.5 | 18.6 | 11.1 |
| 01-Dec-92 | 1.4 | 2.166 | 153 | 18.7 | 2.8 | 7.4 | 2.3 | 7.4 | 2.3 | 11.9 | 21.2 | 11.2 |
| 02-Dec-92 | 1.2 | 1.857 | 141 | 20.0 | 2.9 | 8.1 | 2.6 | 8.1 | 2.6 | 13.0 | 23.1 | 11.3 |
| 03-Dec-92 | 1.2 | 1.857 | 134 | 19.0 | 2.8 | 7.8 | 2.5 | 7.8 | 2.5 | 12.5 | 22.2 | 12.0 |
| 04-Dec-92 | 1.1 | 1.702 | 133 | 20.5 | 3.0 | 8.4 | 2.7 | 8.4 | 2.7 | 13.5 | 24.0 | 12.8 |
| 05-Dec-92 | 1.1 | 1.702 | 129 | 19.9 | 2.9 | 8.2 | 2.6 | 8.2 | 2.6 | 13.2 | 23.4 | 13.1 |
| 06-Dec-92 | 1.1 | 1.702 | 130 | 20.1 | 2.9 | 8.3 | 2.6 | 8.3 | 2.6 | 13.3 | 23.6 | 13.1 |
| 07-Dec-92 | 1.1 | 1.702 | 131 | 20.2 | 2.9 | 8.3 | 2.6 | 8.3 | 2.6 | 13.4 | 23.7 | 13.4 |
| 08-Dec-92 | 1.2 | 1.857 | 133 | 18.9 | 2.8 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 22.0 | 13.1 |
| 09-Dec-92 | 1.3 | 2.011 | 133 | 17.5 | 2.7 | 7.1 | 2.3 | 7.1 | 2.3 | 11.5 | 20.4 | 12.7 |
| 10-Dec-92 | 2.1 | 3.249 | 146 | 12.2 | 2.1 | 4.8 | 1.5 | 4.8 | 1.5 | 7.7 | 13.7 | 11.3 |
| 11-Dec-92 | 1.8 | 2.785 | 140 | 13.6 | 2.3 | 5.4 | 1.7 | 5.4 | 1.7 | 8.7 | 15.4 | 10.1 |
| 12-Dec-92 | 1.6 | 2.476 | 137 | 14.8 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.6 | 17.0 | 9.4 |
| 13-Dec-92 | 1.6 | 2.476 | 133 | 14.4 | 2.3 | 5.8 | 1.8 | 5.8 | 1.8 | 9.4 | 16.6 | 8.9 |
| 14-Dec-92 | 2 | 3.094 | 189 | 16.3 | 2.5 | 6.1 | 1.9 | 6.1 | 1.9 | 9.9 | 17.6 | 9.4 |
| 15-Dec-92 | 1.7 | 2.630 | 159 | 16.1 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.2 | 18.0 | 9.8 |
| 16-Dec-92 | 1.6 | 2.476 | 140 | 15.1 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.8 | 17.3 | 9.8 |
| 17-Dec-92 | 1.6 | 2.476 | 137 | 14.8 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.6 | 17.0 | 9.9 |
| 18-Dec-92 | 1.4 | 2.166 | 129 | 15.9 | 2.5 | 6.5 | 2.0 | 6.5 | 2.0 | 10.4 | 18.5 | 10.0 |
| 19-Dec-92 | 2.2 | 3.404 | 139 | 11.2 | 2.0 | 4.4 | 1.4 | 4.4 | 1.4 | 7.1 | 12.6 | 9.2 |
| 20-Dec-92 | 2.5 | 3.868 | 214 | 14.8 | 2.4 | 5.4 | 1.7 | 5.4 | 1.7 | 8.8 | 15.6 | 9.0 |
| 21-Dec-92 | 2.2 | 3.404 | 158 | 12.6 | 2.2 | 4.9 | 1.5 | 4.9 | 1.5 | 7.9 | 13.9 | 8.6 |
| 22-Dec-92 | 1.7 | 2.630 | 129 | 13.3 | 2.2 | 5.3 | 1.7 | 5.3 | 1.7 | 8.6 | 15.3 | 8.1 |
| 23-Dec-92 | 1.6 | 2.476 | 133 | 14.4 | 2.3 | 5.8 | 1.8 | 5.8 | 1.8 | 9.4 | 16.6 | 8.7 |
| 24-Dec-92 | 1.6 | 2.476 | 129 | 14.0 | 2.3 | 5.7 | 1.8 | 5.7 | 1.8 | 9.2 | 16.2 | 8.8 |
| 25-Dec-92 | 1.5 | 2.321 | 128 | 14.8 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.7 | 17.2 | 9.2 |
| 26-Dec-92 | 1.5 | 2.321 | 129 | 14.9 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.8 | 17.3 | 9.5 |
| 27-Dec-92 | 1.5 | 2.321 | 128 | 14.8 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.7 | 17.2 | 9.6 |
| 28-Dec-92 | 1.6 | 2.476 | 128 | 13.9 | 2.3 | 5.6 | 1.8 | 5.6 | 1.8 | 9.1 | 16.1 | 9.6 |
| 29-Dec-92 | 1.5 | 2.321 | 128 | 14.8 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.7 | 17.2 | 9.6 |
| 30-Dec-92 | 1.4 | 2.166 | 129 | 15.9 | 2.5 | 6.5 | 2.0 | 6.5 | 2.0 | 10.4 | 18.5 | 9.7 |
| 31-Dec-92 | 1.4 | 2.166 | 131 | 16.1 | 2.5 | 6.5 | 2.1 | 6.5 | 2.1 | 10.6 | 18.7 | 10.0 |
| 01-Jan-93 | 1.3 | 2.011 | 132 | 17.4 | 2.6 | 7.1 | 2.2 | 7.1 | 2.2 | 11.4 | 20.2 | 10.5 |
| 02-Jan-93 | 1.4 | 2.166 | 130 | 16.0 | 2.5 | 6.5 | 2.1 | 6.5 | 2.1 | 10.5 | 18.6 | 10.7 |
| 03-Jan-93 | 1.5 | 2.321 | 133 | 15.3 | 2.4 | 6.2 | 2.0 | 6.2 | 2.0 | 10.0 | 17.7 | 10.6 |
| 04-Jan-93 | 1.5 | 2.321 | 130 | 15.0 | 2.4 | 6.1 | 1.9 | 6.1 | 1.9 | 9.8 | 17.4 | 10.4 |
| 05-Jan-93 | 1.4 | 2.166 | 129 | 15.9 | 2.5 | 6.5 | 2.0 | 6.5 | 2.0 | 10.4 | 18.5 | 10.2 |
| 06-Jan-93 | 1.4 | 2.166 | 134 | 16.5 | 2.5 | 6.7 | 2.1 | 6.7 | 2.1 | 10.8 | 19.1 | 10.3 |
| 07-Jan-93 | 1.4 | 2.166 | 146 | 17.9 | 2.7 | 7.1 | 2.3 | 7.1 | 2.3 | 11.5 | 20.4 | 10.6 |
| 08-Jan-93 | 1.4 | 2.166 | 130 | 16.0 | 2.5 | 6.5 | 2.1 | 6.5 | 2.1 | 10.5 | 18.6 | 10.8 |
| 09-Jan-93 | 1.3 | 2.011 | 449 | 56.8 | 6.6 | 18.8 | 5.9 | 18.8 | 5.9 | 30.2 | 53.6 | 15.7 |
| 10-Jan-93 | 1.4 | 2.166 | 502 | 58.9 | 6.8 | 19.1 | 6.0 | 19.1 | 6.0 | 30.7 | 54.5 | 20.7 |
| 11-Jan-93 | 1.4 | 2.166 | 377 | 44.5 | 5.4 | 15.2 | 4.8 | 15.2 | 4.8 | 24.4 | 43.3 | 23.9 |
| 12-Jan-93 | 1.4 | 2.166 | 320 | 37.9 | 4.7 | 13.3 | 4.2 | 13.3 | 4.2 | 21.4 | 38.0 | 26.7 |
| 13-Jan-93 | 1.4 | 2.166 | 479 | 56.3 | 6.5 | 18.4 | 5.8 | 18.4 | 5.8 | 29.5 | 52.5 | 26.5 |
| 14-Jan-93 | 1.4 | 2.166 | 529 | 62.1 | 7.1 | 19.9 | 6.3 | 19.9 | 6.3 | 32.0 | 56.8 | 26.8 |
| 15-Jan-93 | 1.3 | 2.011 | 539 | 68.0 | 7.7 | 21.8 | 6.9 | 21.8 | 6.9 | 34.9 | 62.1 | 29.5 |
| 16-Jan-93 | 1.3 | 2.011 | 483 | 61.0 | 7.0 | 19.9 | 6.3 | 19.9 | 6.3 | 32.0 | 56.8 | 32.1 |
| 17-Jan-93 | 1.4 | 2.166 | 322 | 38.2 | 4.7 | 13.4 | 4.2 | 13.4 | 4.2 | 21.5 | 38.2 | 30.1 |
| 18-Jan-93 | 1.3 | 2.011 | 210 | 27.1 | 3.6 | 10.2 | 3.2 | 10.2 | 3.2 | 16.5 | 29.2 | 26.2 |
| 19-Jan-93 | 1.5 | 2.321 | 156 | 17.8 | 2.7 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 20.1 | 20.3 |
| 20-Jan-93 | 1.2 | 1.857 | 170 | 23.9 | 3.3 | 9.4 | 3.0 | 9.4 | 3.0 | 15.1 | 26.8 | 16.1 |
| 21-Jan-93 | 1.3 | 2.011 | 163 | 21.3 | 3.0 | 8.4 | 2.6 | 8.4 | 2.6 | 13.5 | 23.9 | 14.1 |
| 22-Jan-93 | 1.7 | 2.630 | 136 | 13.9 | 2.3 | 5.6 | 1.8 | 5.6 | 1.8 | 9.0 | 15.9 | 12.2 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mgN/L, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs) | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mgN/L) | Acute (mgN/L) | Chronic (mgN/L) |
| 23-Jan-93 | 1.5 | 2.321 | 134 | 15.4 | 2.4 | 6.2 | 2.0 | 6.2 | 2.0 | 10.1 | 17.8 | 11.9 |
| 24-Jan-93 | 2.5 | 3.868 | 143 | 10.2 | 1.9 | 4.0 | 1.3 | 4.0 | 1.3 | 6.4 | 11.4 | 9.7 |
| 25-Jan-93 | 3.4 | 5.260 | 2020 | 97.0 | 10.8 | 24.1 | 7.6 | 24.1 | 7.6 | 38.6 | 68.7 | 16.0 |
| 26-Jan-93 | 3 | 4.642 | 2680 | 145.3 | 15.4 | 34.3 | 10.8 | 34.3 | 10.8 | 54.9 | 97.6 | 27.5 |
| 27-Jan-93 | 2 | 3.094 | 1420 | 115.7 | 12.5 | 30.8 | 9.7 | 30.8 | 9.7 | 49.4 | 87.8 | 37.4 |
| 28-Jan-93 | 1.8 | 2.785 | 890 | 80.9 | 9.0 | 23.5 | 7.4 | 23.5 | 7.4 | 37.8 | 67.1 | 45.2 |
| 29-Jan-93 | 1.6 | 2.476 | 700 | 71.7 | 8.1 | 21.8 | 6.9 | 21.8 | 6.9 | 35.0 | 62.2 | 44.3 |
| 30-Jan-93 | 1.6 | 2.476 | 588 | 60.4 | 6.9 | 19.0 | 6.0 | 19.0 | 6.0 | 30.5 | 54.1 | 38.2 |
| 31-Jan-93 | 1.5 | 2.321 | 539 | 59.1 | 6.8 | 18.9 | 6.0 | 18.9 | 6.0 | 30.3 | 53.8 | 33.4 |
| 01-Feb-93 | 1.5 | 2.321 | 488 | 53.6 | 6.3 | 17.4 | 5.5 | 17.4 | 5.5 | 28.0 | 49.7 | 30.9 |
| 02-Feb-93 | 1.4 | 2.166 | 427 | 50.3 | 5.9 | 16.8 | 5.3 | 16.8 | 5.3 | 26.9 | 47.8 | 28.9 |
| 03-Feb-93 | 1.4 | 2.166 | 392 | 46.2 | 5.5 | 15.7 | 5.0 | 15.7 | 5.0 | 25.2 | 44.7 | 27.6 |
| 04-Feb-93 | 1.4 | 2.166 | 371 | 43.8 | 5.3 | 15.0 | 4.7 | 15.0 | 4.7 | 24.1 | 42.8 | 26.0 |
| 05-Feb-93 | 1.4 | 2.166 | 370 | 43.7 | 5.3 | 15.0 | 4.7 | 15.0 | 4.7 | 24.0 | 42.7 | 25.1 |
| 06-Feb-93 | 1.4 | 2.166 | 367 | 43.4 | 5.2 | 14.9 | 4.7 | 14.9 | 4.7 | 23.9 | 42.4 | 24.3 |
| 07-Feb-93 | 1.4 | 2.166 | 410 | 48.3 | 5.7 | 16.2 | 5.1 | 16.2 | 5.1 | 26.1 | 46.3 | 24.5 |
| 08-Feb-93 | 1.4 | 2.166 | 606 | 70.9 | 8.0 | 22.2 | 7.0 | 22.2 | 7.0 | 35.6 | 63.3 | 27.4 |
| 09-Feb-93 | 1.4 | 2.166 | 1120 | 130.3 | 13.9 | 36.4 | 11.5 | 36.4 | 11.5 | 58.3 | 103.6 | 36.0 |
| 10-Feb-93 | 1.4 | 2.166 | 1110 | 129.1 | 13.8 | 36.1 | 11.4 | 36.1 | 11.4 | 57.9 | 102.9 | 44.5 |
| 11-Feb-93 | 1.5 | 2.321 | 1080 | 117.3 | 12.6 | 33.0 | 10.4 | 33.0 | 10.4 | 52.9 | 93.9 | 51.2 |
| 12-Feb-93 | 1.4 | 2.166 | 919 | 107.1 | 11.6 | 31.0 | 9.8 | 31.0 | 9.8 | 49.7 | 88.4 | 54.7 |
| 13-Feb-93 | 1.4 | 2.166 | 274 | 32.6 | 4.2 | 11.8 | 3.7 | 11.8 | 3.7 | 18.9 | 33.6 | 44.8 |
| 14-Feb-93 | 1.4 | 2.166 | 132 | 16.2 | 2.5 | 6.6 | 2.1 | 6.6 | 2.1 | 10.6 | 18.8 | 33.0 |
| 15-Feb-93 | 1.4 | 2.166 | 131 | 16.1 | 2.5 | 6.5 | 2.1 | 6.5 | 2.1 | 10.6 | 18.7 | 22.5 |
| 16-Feb-93 | 1.4 | 2.166 | 129 | 15.9 | 2.5 | 6.5 | 2.0 | 6.5 | 2.0 | 10.4 | 18.5 | 12.6 |
| 17-Feb-93 | 1.4 | 2.166 | 133 | 16.4 | 2.5 | 6.6 | 2.1 | 6.6 | 2.1 | 10.7 | 18.9 | 10.6 |
| 18-Feb-93 | 1.4 | 2.166 | 136 | 16.7 | 2.6 | 6.7 | 2.1 | 6.7 | 2.1 | 10.9 | 19.3 | 10.6 |
| 19-Feb-93 | 1.3 | 2.011 | 141 | 18.5 | 2.8 | 7.5 | 2.4 | 7.5 | 2.4 | 12.0 | 21.3 | 11.0 |
| 20-Feb-93 | 1.4 | 2.166 | 138 | 16.9 | 2.6 | 6.8 | 2.2 | 6.8 | 2.2 | 11.0 | 19.5 | 11.2 |
| 21-Feb-93 | 1.3 | 2.011 | 131 | 17.3 | 2.6 | 7.0 | 2.2 | 7.0 | 2.2 | 11.4 | 20.1 | 11.3 |
| 22-Feb-93 | 1.2 | 1.857 | 131 | 18.6 | 2.8 | 7.6 | 2.4 | 7.6 | 2.4 | 12.3 | 21.8 | 11.7 |
| 23-Feb-93 | 1.2 | 1.857 | 133 | 18.9 | 2.8 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 22.0 | 11.8 |
| 24-Feb-93 | 1.3 | 2.011 | 133 | 17.5 | 2.7 | 7.1 | 2.3 | 7.1 | 2.3 | 11.5 | 20.4 | 11.9 |
| 25-Feb-93 | 1.4 | 2.166 | 133 | 16.4 | 2.5 | 6.6 | 2.1 | 6.6 | 2.1 | 10.7 | 18.9 | 11.7 |
| 26-Feb-93 | 1.3 | 2.011 | 137 | 18.0 | 2.7 | 7.3 | 2.3 | 7.3 | 2.3 | 11.8 | 20.9 | 11.6 |
| 27-Feb-93 | 1.3 | 2.011 | 134 | 17.7 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.5 | 11.4 |
| 28-Feb-93 | 1.4 | 2.166 | 138 | 16.9 | 2.6 | 6.8 | 2.2 | 6.8 | 2.2 | 11.0 | 19.5 | 11.3 |
| 01-Mar-93 | 1.3 | 2.011 | 135 | 17.8 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.6 | 11.5 |
| 02-Mar-93 | 1.4 | 2.166 | 131 | 16.1 | 2.5 | 6.5 | 2.1 | 6.5 | 2.1 | 10.6 | 18.7 | 11.2 |
| 03-Mar-93 | 1.4 | 2.166 | 140 | 17.2 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.1 | 19.7 | 11.1 |
| 04-Mar-93 | 1.5 | 2.321 | 134 | 15.4 | 2.4 | 6.2 | 2.0 | 6.2 | 2.0 | 10.1 | 17.8 | 10.8 |
| 05-Mar-93 | 1.4 | 2.166 | 129 | 15.9 | 2.5 | 6.5 | 2.0 | 6.5 | 2.0 | 10.4 | 18.5 | 10.5 |
| 06-Mar-93 | 1.4 | 2.166 | 133 | 16.4 | 2.5 | 6.6 | 2.1 | 6.6 | 2.1 | 10.7 | 18.9 | 10.6 |
| 07-Mar-93 | 1.3 | 2.011 | 127 | 16.8 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.1 | 19.6 | 10.6 |
| 08-Mar-93 | 1.4 | 2.166 | 133 | 16.4 | 2.5 | 6.6 | 2.1 | 6.6 | 2.1 | 10.7 | 18.9 | 10.7 |
| 09-Mar-93 | 1.4 | 2.166 | 131 | 16.1 | 2.5 | 6.5 | 2.1 | 6.5 | 2.1 | 10.6 | 18.7 | 10.8 |
| 10-Mar-93 | 1.3 | 2.011 | 128 | 16.9 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.2 | 19.8 | 10.9 |
| 11-Mar-93 | 1.3 | 2.011 | 128 | 16.9 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.2 | 19.8 | 10.9 |
| 12-Mar-93 | 1.3 | 2.011 | 130 | 17.2 | 2.6 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 20.0 | 11.0 |
| 13-Mar-93 | 1.2 | 1.857 | 129 | 18.4 | 2.7 | 7.5 | 2.4 | 7.5 | 2.4 | 12.1 | 21.5 | 11.4 |
| 14-Mar-93 | 1.6 | 2.476 | 142 | 15.3 | 2.4 | 6.1 | 1.9 | 6.1 | 1.9 | 9.9 | 17.5 | 11.1 |
| 15-Mar-93 | 1.5 | 2.321 | 770 | 83.9 | 9.3 | 25.1 | 7.9 | 25.1 | 7.9 | 40.3 | 71.6 | 18.4 |
| 16-Mar-93 | 0.7 | 1.083 | 394 | 91.9 | 10.1 | 31.4 | 9.9 | 31.4 | 9.9 | 50.3 | 89.4 | 28.2 |
| 17-Mar-93 | 1.3 | 2.011 | 172 | 22.4 | 3.1 | 8.7 | 2.8 | 8.7 | 2.8 | 14.1 | 25.0 | 28.6 |
| 18-Mar-93 | 0.8 | 1.238 | 155 | 32.3 | 4.1 | 13.0 | 4.1 | 13.0 | 4.1 | 20.9 | 37.1 | 31.4 |
| 19-Mar-93 | 0.7 | 1.083 | 137 | 32.6 | 4.2 | 13.5 | 4.3 | 13.5 | 4.2 | 21.6 | 37.6 | 26.7 |
| 20-Mar-93 | 0.7 | 1.083 | 128 | 30.5 | 4.0 | 12.8 | 4.0 | 12.8 | 4.0 | 20.5 | 35.7 | 19.3 |
| 21-Mar-93 | 1.6 | 2.476 | 127 | 13.8 | 2.3 | 5.6 | 1.8 | 5.6 | 1.8 | 9.1 | 16.0 | 18.0 |
| 22-Mar-93 | 2.9 | 4.487 | 232 | 13.9 | 2.3 | 5.0 | 1.6 | 5.0 | 1.6 | 8.1 | 14.4 | 14.8 |
| 23-Mar-93 | 2.5 | 3.868 | 2190 | 142.5 | 15.2 | 34.9 | 11.0 | 34.9 | 11.0 | 56.0 | 99.5 | 23.4 |
| 24-Mar-93 | 1.5 | 2.321 | 1450 | 157.2 | 16.6 | 41.8 | 13.2 | 41.8 | 13.2 | 66.9 | 119.0 | 35.0 |
| 25-Mar-93 | 1.1 | 1.702 | 518 | 77.1 | 8.6 | 24.9 | 7.9 | 24.9 | 7.9 | 40.0 | 71.0 | 42.8 |
| 26-Mar-93 | 1 | 1.547 | 159 | 26.7 | 3.6 | 10.6 | 3.4 | 10.6 | 3.4 | 17.1 | 30.4 | 45.0 |
| 27-Mar-93 | 0.6 | 0.928 | 137 | 37.9 | 4.7 | 15.7 | 5.0 | 15.7 | 4.7 | 25.2 | 42.3 | 37.3 |
| 28-Mar-93 | 0.7 | 1.083 | 140 | 33.3 | 4.2 | 13.7 | 4.3 | 13.7 | 4.2 | 22.0 | 38.2 | 26.1 |
| 29-Mar-93 | 0.6 | 0.928 | 132 | 36.5 | 4.6 | 15.2 | 4.8 | 15.2 | 4.6 | 24.5 | 41.1 | 22.2 |
| 30-Mar-93 | 0.7 | 1.083 | 134 | 31.9 | 4.1 | 13.2 | 4.2 | 13.2 | 4.1 | 21.3 | 36.9 | 23.2 |
| 31-Mar-93 | 0.7 | 1.083 | 129 | 30.8 | 4.0 | 12.8 | 4.1 | 12.8 | 4.0 | 20.6 | 35.9 | 22.1 |
| 01-Apr-93 | 0.9 | 1.392 | 136 | 25.4 | 3.4 | 10.4 | 3.3 | 10.4 | 3.3 | 16.8 | 29.8 | 20.8 |
| 02-Apr-93 | 1 | 1.547 | 137 | 23.1 | 3.2 | 9.5 | 3.0 | 9.5 | 3.0 | 15.2 | 27.0 | 18.5 |
| 03-Apr-93 | 1.5 | 2.321 | 156 | 17.8 | 2.7 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 20.1 | 16.0 |
| 04-Apr-93 | 1 | 1.547 | 141 | 23.8 | 3.3 | 9.7 | 3.1 | 9.7 | 3.1 | 15.6 | 27.6 | 14.7 |
| 05-Apr-93 | 0.8 | 1.238 | 130 | 27.3 | 3.6 | 11.3 | 3.6 | 11.3 | 3.6 | 18.2 | 32.3 | 15.1 |
| 06-Apr-93 | 0.9 | 1.392 | 133 | 24.9 | 3.4 | 10.2 | 3.2 | 10.2 | 3.2 | 16.5 | 29.3 | 15.4 |
| 07-Apr-93 | 0.8 | 1.238 | 130 | 27.3 | 3.6 | 11.3 | 3.6 | 11.3 | 3.6 | 18.2 | 32.3 | 17.1 |
| 08-Apr-93 | 1.3 | 2.011 | 136 | 17.9 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.7 | 20.7 | 16.1 |
| 09-Apr-93 | 1.6 | 2.476 | 244 | 25.6 | 3.5 | 9.4 | 3.0 | 9.4 | 3.0 | 15.1 | 26.8 | 15.4 |
| 10-Apr-93 | 1.3 | 2.011 | 160 | 20.9 | 3.0 | 8.2 | 2.6 | 8.2 | 2.6 | 13.3 | 23.6 | 14.6 |
| 11-Apr-93 | 1.3 | 2.011 | 153 | 20.0 | 2.9 | 8.0 | 2.5 | 8.0 | 2.5 | 12.8 | 22.8 | 13.2 |
| 12-Apr-93 | 1 | 1.547 | 145 | 24.4 | 3.3 | 9.9 | 3.1 | 9.9 | 3.1 | 15.9 | 28.2 | 14.3 |
| 13-Apr-93 | 0.9 | 1.392 | 136 | 25.4 | 3.4 | 10.4 | 3.3 | 10.4 | 3.3 | 16.8 | 29.8 | 14.7 |
| 14-Apr-93 | 0.7 | 1.083 | 130 | 31.0 | 4.0 | 12.9 | 4.1 | 12.9 | 4.0 | 20.8 | 36.1 | 16.6 |
| 15-Apr-93 | 0.7 | 1.083 | 132 | 31.5 | 4.0 | 13.1 | 4.1 | 13.1 | 4.0 | 21.0 | 36.5 | 18.6 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mgN/L, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs) | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mgN/L) | Acute (mgN/L) | Chronic (mgN/L) |
| 16-Apr-93 | 1.1 | 1.702 | 1070 | 158.2 | 16.7 | 44.6 | 14.1 | 44.6 | 14.1 | 71.5 | 127.1 | 32.5 |
| 17-Apr-93 | 1.1 | 1.702 | 164 | 25.1 | 3.4 | 9.9 | 3.1 | 9.9 | 3.1 | 16.0 | 28.3 | 32.3 |
| 18-Apr-93 | 1 | 1.547 | 136 | 23.0 | 3.2 | 9.4 | 3.0 | 9.4 | 3.0 | 15.1 | 26.8 | 30.9 |
| 19-Apr-93 | 0.8 | 1.238 | 135 | 28.3 | 3.7 | 11.7 | 3.7 | 11.7 | 3.7 | 18.5 | 33.3 | 30.3 |
| 20-Apr-93 | 0.7 | 1.083 | 129 | 30.8 | 4.0 | 12.8 | 4.1 | 12.8 | 4.0 | 20.6 | 35.9 | 17.6 |
| 21-Apr-93 | 0.8 | 1.238 | 130 | 27.3 | 3.6 | 11.3 | 3.6 | 11.3 | 3.6 | 18.2 | 32.3 | 18.2 |
| 22-Apr-93 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 19.0 |
| 23-Apr-93 | 0.8 | 1.238 | 131 | 27.5 | 3.6 | 11.4 | 3.6 | 11.4 | 3.6 | 18.3 | 32.5 | 18.9 |
| 24-Apr-93 | 0.9 | 1.392 | 139 | 26.0 | 3.5 | 10.6 | 3.4 | 10.6 | 3.4 | 17.1 | 30.3 | 18.0 |
| 25-Apr-93 | 1.1 | 1.702 | 142 | 21.9 | 3.1 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.3 | 17.0 |
| 26-Apr-93 | 1.4 | 2.166 | 143 | 17.5 | 2.7 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 20.1 | 15.2 |
| 27-Apr-93 | 1.2 | 1.857 | 151 | 21.3 | 3.0 | 8.5 | 2.7 | 8.5 | 2.7 | 13.7 | 24.4 | 14.1 |
| 28-Apr-93 | 1 | 1.547 | 131 | 22.2 | 3.1 | 9.1 | 2.9 | 9.1 | 2.9 | 14.7 | 26.1 | 13.5 |
| 29-Apr-93 | 1.3 | 2.011 | 153 | 20.0 | 2.9 | 8.0 | 2.5 | 8.0 | 2.5 | 12.8 | 22.8 | 13.1 |
| 30-Apr-93 | 1.2 | 1.857 | 193 | 27.0 | 3.6 | 10.4 | 3.3 | 10.4 | 3.3 | 16.7 | 29.6 | 14.5 |
| 01-Nov-93 | 1 | 1.547 | 132 | 22.3 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.8 | 26.2 | |
| 02-Nov-93 | 1 | 1.547 | 130 | 22.0 | 3.1 | 9.1 | 2.9 | 9.1 | 2.9 | 14.6 | 25.9 | |
| 03-Nov-93 | 1 | 1.547 | 140 | 23.6 | 3.3 | 9.6 | 3.0 | 9.6 | 3.0 | 15.5 | 27.5 | |
| 04-Nov-93 | 1 | 1.547 | 133 | 22.5 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.9 | 26.4 | 14.9 |
| 05-Nov-93 | 1 | 1.547 | 131 | 22.2 | 3.1 | 9.1 | 2.9 | 9.1 | 2.9 | 14.7 | 26.1 | 14.9 |
| 06-Nov-93 | 1 | 1.547 | 130 | 22.0 | 3.1 | 9.1 | 2.9 | 9.1 | 2.9 | 14.6 | 25.9 | 14.9 |
| 07-Nov-93 | 1.1 | 1.702 | 130 | 20.1 | 2.9 | 8.3 | 2.6 | 8.3 | 2.6 | 13.3 | 23.6 | 14.4 |
| 08-Nov-93 | 1 | 1.547 | 132 | 22.3 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.8 | 26.2 | 14.3 |
| 09-Nov-93 | 1 | 1.547 | 134 | 22.7 | 3.2 | 9.3 | 2.9 | 9.3 | 2.9 | 15.0 | 26.5 | 14.4 |
| 10-Nov-93 | 1 | 1.547 | 132 | 22.3 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.8 | 26.2 | 14.5 |
| 11-Nov-93 | 1 | 1.547 | 131 | 22.2 | 3.1 | 9.1 | 2.9 | 9.1 | 2.9 | 14.7 | 26.1 | 14.8 |
| 12-Nov-93 | 2 | 3.094 | 133 | 11.7 | 2.1 | 4.7 | 1.5 | 4.7 | 1.5 | 7.6 | 13.4 | 13.0 |
| 13-Nov-93 | 1 | 1.547 | 133 | 22.5 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.9 | 26.4 | 13.0 |
| 14-Nov-93 | 0.9 | 1.392 | 131 | 24.5 | 3.4 | 10.1 | 3.2 | 10.1 | 3.2 | 16.3 | 28.9 | 13.4 |
| 15-Nov-93 | 1 | 1.547 | 132 | 22.3 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.8 | 26.2 | 13.4 |
| 16-Nov-93 | 1 | 1.547 | 134 | 22.7 | 3.2 | 9.3 | 2.9 | 9.3 | 2.9 | 15.0 | 26.5 | 15.2 |
| 17-Nov-93 | 1.1 | 1.702 | 130 | 20.1 | 2.9 | 8.3 | 2.6 | 8.3 | 2.6 | 13.3 | 23.6 | 14.8 |
| 18-Nov-93 | 1 | 1.547 | 133 | 22.5 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.9 | 26.4 | 14.5 |
| 19-Nov-93 | 1 | 1.547 | 131 | 22.2 | 3.1 | 9.1 | 2.9 | 9.1 | 2.9 | 14.7 | 26.1 | 14.5 |
| 20-Nov-93 | 0.9 | 1.392 | 131 | 24.5 | 3.4 | 10.1 | 3.2 | 10.1 | 3.2 | 16.3 | 28.9 | 14.8 |
| 21-Nov-93 | 1 | 1.547 | 136 | 23.0 | 3.2 | 9.4 | 3.0 | 9.4 | 3.0 | 15.1 | 26.8 | 15.3 |
| 22-Nov-93 | 1 | 1.547 | 197 | 32.8 | 4.2 | 12.6 | 4.0 | 12.6 | 4.0 | 20.3 | 36.0 | 16.6 |
| 23-Nov-93 | 1 | 1.547 | 133 | 22.5 | 3.1 | 9.2 | 2.9 | 9.2 | 2.9 | 14.9 | 26.4 | 16.7 |
| 24-Nov-93 | 1 | 1.547 | 136 | 23.0 | 3.2 | 9.4 | 3.0 | 9.4 | 3.0 | 15.1 | 26.8 | 16.4 |
| 25-Nov-93 | 1 | 1.547 | 146 | 24.6 | 3.4 | 9.9 | 3.1 | 9.9 | 3.1 | 16.0 | 28.4 | 16.6 |
| 26-Nov-93 | 1 | 1.547 | 134 | 22.7 | 3.2 | 9.3 | 2.9 | 9.3 | 2.9 | 15.0 | 26.5 | 15.2 |
| 27-Nov-93 | 1.1 | 1.702 | 134 | 20.7 | 3.0 | 8.5 | 2.7 | 8.5 | 2.7 | 13.6 | 24.2 | 14.9 |
| 28-Nov-93 | 1.2 | 1.857 | 133 | 18.9 | 2.8 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 22.0 | 14.3 |
| 29-Nov-93 | 1.3 | 2.011 | 139 | 18.3 | 2.7 | 7.4 | 2.3 | 7.4 | 2.3 | 11.9 | 21.1 | 13.2 |
| 30-Nov-93 | 1.3 | 2.011 | 135 | 17.8 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.6 | 12.4 |
| 01-Dec-93 | 1.5 | 2.321 | 379 | 41.8 | 5.1 | 14.2 | 4.5 | 14.2 | 4.5 | 22.9 | 40.6 | 14.7 |
| 02-Dec-93 | 1.4 | 2.166 | 452 | 53.2 | 6.2 | 17.6 | 5.6 | 17.6 | 5.6 | 28.2 | 50.1 | 18.7 |
| 03-Dec-93 | 1.4 | 2.166 | 135 | 16.6 | 2.6 | 6.7 | 2.1 | 6.7 | 2.1 | 10.8 | 19.2 | 18.4 |
| 04-Dec-93 | 1.3 | 2.011 | 129 | 17.0 | 2.6 | 7.0 | 2.2 | 7.0 | 2.2 | 11.2 | 19.9 | 18.3 |
| 05-Dec-93 | 1.2 | 1.857 | 131 | 18.6 | 2.8 | 7.6 | 2.4 | 7.6 | 2.4 | 12.3 | 21.8 | 15.6 |
| 06-Dec-93 | 1.2 | 1.857 | 133 | 18.9 | 2.8 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 22.0 | 11.7 |
| 07-Dec-93 | 1.3 | 2.011 | 130 | 17.2 | 2.6 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 20.0 | 11.8 |
| 08-Dec-93 | 1.4 | 2.166 | 130 | 16.0 | 2.5 | 6.5 | 2.1 | 6.5 | 2.1 | 10.5 | 18.6 | 11.6 |
| 09-Dec-93 | 1.3 | 2.011 | 131 | 17.3 | 2.6 | 7.0 | 2.2 | 7.0 | 2.2 | 11.4 | 20.1 | 11.4 |
| 10-Dec-93 | 1.3 | 2.011 | 140 | 18.4 | 2.7 | 7.4 | 2.3 | 7.4 | 2.3 | 12.0 | 21.2 | 11.3 |
| 11-Dec-93 | 1.3 | 2.011 | 137 | 18.0 | 2.7 | 7.3 | 2.3 | 7.3 | 2.3 | 11.8 | 20.9 | 11.4 |
| 12-Dec-93 | 1.4 | 2.166 | 132 | 16.2 | 2.5 | 6.6 | 2.1 | 6.6 | 2.1 | 10.6 | 18.8 | 11.4 |
| 13-Dec-93 | 1.3 | 2.011 | 132 | 17.4 | 2.6 | 7.1 | 2.2 | 7.1 | 2.2 | 11.4 | 20.2 | 11.4 |
| 14-Dec-93 | 1.2 | 1.857 | 132 | 18.8 | 2.8 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 21.9 | 11.5 |
| 15-Dec-93 | 1.2 | 1.857 | 130 | 18.5 | 2.8 | 7.6 | 2.4 | 7.6 | 2.4 | 12.2 | 21.6 | 11.7 |
| 16-Dec-93 | 1.2 | 1.857 | 129 | 18.4 | 2.7 | 7.5 | 2.4 | 7.5 | 2.4 | 12.1 | 21.5 | 12.0 |
| 17-Dec-93 | 1.1 | 1.702 | 129 | 19.9 | 2.9 | 8.2 | 2.6 | 8.2 | 2.6 | 13.2 | 23.4 | 12.5 |
| 18-Dec-93 | 1.1 | 1.702 | 129 | 19.9 | 2.9 | 8.2 | 2.6 | 8.2 | 2.6 | 13.2 | 23.4 | 12.7 |
| 19-Dec-93 | 1.1 | 1.702 | 131 | 20.2 | 2.9 | 8.3 | 2.6 | 8.3 | 2.6 | 13.4 | 23.7 | 13.0 |
| 20-Dec-93 | 1.1 | 1.702 | 140 | 21.6 | 3.1 | 8.8 | 2.8 | 8.8 | 2.8 | 14.1 | 25.0 | 13.5 |
| 21-Dec-93 | 1.1 | 1.702 | 139 | 21.4 | 3.0 | 8.7 | 2.8 | 8.7 | 2.8 | 14.0 | 24.9 | 13.7 |
| 22-Dec-93 | 0.6 | 0.928 | 134 | 37.1 | 4.6 | 15.4 | 4.9 | 15.4 | 4.6 | 24.8 | 41.6 | 16.6 |
| 23-Dec-93 | 0.7 | 1.083 | 137 | 32.6 | 4.2 | 13.5 | 4.3 | 13.5 | 4.2 | 21.6 | 37.6 | 18.6 |
| 24-Dec-93 | 0.7 | 1.083 | 141 | 33.5 | 4.3 | 13.8 | 4.4 | 13.8 | 4.3 | 22.1 | 38.4 | 20.6 |
| 25-Dec-93 | 0.6 | 0.928 | 134 | 37.1 | 4.6 | 15.4 | 4.9 | 15.4 | 4.6 | 24.8 | 41.6 | 23.3 |
| 26-Dec-93 | 0.7 | 1.083 | 132 | 31.5 | 4.0 | 13.1 | 4.1 | 13.1 | 4.0 | 21.0 | 36.5 | 22.4 |
| 27-Dec-93 | 0.7 | 1.083 | 133 | 31.7 | 4.1 | 13.2 | 4.2 | 13.2 | 4.1 | 21.1 | 36.7 | 22.3 |
| 28-Dec-93 | 0.6 | 0.928 | 135 | 37.4 | 4.6 | 15.5 | 4.9 | 15.5 | 4.6 | 24.9 | 41.8 | 23.0 |
| 29-Dec-93 | 0.6 | 0.928 | 136 | 37.6 | 4.7 | 15.6 | 4.9 | 15.6 | 4.7 | 25.1 | 42.1 | 23.0 |
| 30-Dec-93 | 1 | 1.547 | 134 | 22.7 | 3.2 | 9.3 | 2.9 | 9.3 | 2.9 | 15.0 | 26.5 | 21.5 |
| 31-Dec-93 | 1.3 | 2.011 | 141 | 18.5 | 2.8 | 7.5 | 2.4 | 7.5 | 2.4 | 12.0 | 21.3 | 19.2 |
| 01-Jan-94 | 1.2 | 1.857 | 176 | 24.7 | 3.4 | 9.6 | 3.0 | 9.6 | 3.0 | 15.5 | 27.5 | 16.9 |
| 02-Jan-94 | 1.5 | 2.321 | 155 | 17.7 | 2.7 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 20.0 | 13.4 |
| 03-Jan-94 | 1.6 | 2.476 | 153 | 16.5 | 2.5 | 6.5 | 2.0 | 6.5 | 2.0 | 10.5 | 18.5 | 12.3 |
| 04-Jan-94 | 1.9 | 2.940 | 182 | 16.5 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.1 | 18.0 | 11.8 |
| 05-Jan-94 | 1.8 | 2.785 | 236 | 22.2 | 3.1 | 8.1 | 2.6 | 8.1 | 2.6 | 13.1 | 23.3 | 11.3 |
| 06-Jan-94 | 1.4 | 2.166 | 145 | 17.7 | 2.7 | 7.1 | 2.2 | 7.1 | 2.2 | 11.4 | 20.3 | 11.3 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mgN/L, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs): | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mgN/L) | Acute (mgN/L) | Chronic (mgN/L) |
| 07-Jan-94 | 1.6 | 2.476 | 140 | 15.1 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.8 | 17.3 | 11.1 |
| 08-Jan-94 | 1.5 | 2.321 | 146 | 16.7 | 2.6 | 6.7 | 2.1 | 6.7 | 2.1 | 10.8 | 19.0 | 11.3 |
| 09-Jan-94 | 1.4 | 2.166 | 142 | 17.4 | 2.6 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 19.9 | 10.8 |
| 10-Jan-94 | 1.8 | 2.785 | 146 | 14.1 | 2.3 | 5.6 | 1.8 | 5.6 | 1.8 | 9.0 | 15.9 | 10.2 |
| 11-Jan-94 | 1.5 | 2.321 | 166 | 18.9 | 2.8 | 7.4 | 2.3 | 7.4 | 2.3 | 11.9 | 21.1 | 10.7 |
| 12-Jan-94 | 1.8 | 2.785 | 201 | 19.0 | 2.8 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.5 | 10.9 |
| 13-Jan-94 | 1.6 | 2.476 | 517 | 53.2 | 6.2 | 17.1 | 5.4 | 17.1 | 5.4 | 27.5 | 48.8 | 15.0 |
| 14-Jan-94 | 1.5 | 2.321 | 418 | 46.0 | 5.5 | 15.4 | 4.9 | 15.4 | 4.9 | 24.7 | 43.9 | 18.9 |
| 15-Jan-94 | 1.3 | 2.011 | 152 | 19.9 | 2.9 | 7.9 | 2.5 | 7.9 | 2.5 | 12.8 | 22.6 | 19.1 |
| 16-Jan-94 | 1.3 | 2.011 | 135 | 17.8 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.6 | 19.2 |
| 17-Jan-94 | 1.3 | 2.011 | 139 | 18.3 | 2.7 | 7.4 | 2.3 | 7.4 | 2.3 | 11.9 | 21.1 | 15.3 |
| 18-Jan-94 | 1.2 | 1.857 | 134 | 19.0 | 2.8 | 7.8 | 2.5 | 7.8 | 2.5 | 12.5 | 22.2 | 12.2 |
| 19-Jan-94 | 1.2 | 1.857 | 134 | 19.0 | 2.8 | 7.8 | 2.5 | 7.8 | 2.5 | 12.5 | 22.2 | 12.1 |
| 20-Jan-94 | 1.1 | 1.702 | 135 | 20.8 | 3.0 | 8.5 | 2.7 | 8.5 | 2.7 | 13.7 | 24.3 | 12.7 |
| 21-Jan-94 | 1.2 | 1.857 | 131 | 18.6 | 2.8 | 7.6 | 2.4 | 7.6 | 2.4 | 12.3 | 21.8 | 12.8 |
| 22-Jan-94 | 1.5 | 2.321 | 136 | 15.7 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.2 | 18.0 | 12.2 |
| 23-Jan-94 | 1.7 | 2.630 | 140 | 14.3 | 2.3 | 5.7 | 1.8 | 5.7 | 1.8 | 9.2 | 16.3 | 11.3 |
| 24-Jan-94 | 1.7 | 2.630 | 137 | 14.0 | 2.3 | 5.6 | 1.8 | 5.6 | 1.8 | 9.1 | 16.0 | 10.2 |
| 25-Jan-94 | 1.6 | 2.476 | 141 | 15.2 | 2.4 | 6.1 | 1.9 | 6.1 | 1.9 | 9.8 | 17.4 | 9.6 |
| 26-Jan-94 | 1.4 | 2.166 | 138 | 16.9 | 2.6 | 6.8 | 2.2 | 6.8 | 2.2 | 11.0 | 19.5 | 9.8 |
| 27-Jan-94 | 1.4 | 2.166 | 134 | 16.5 | 2.5 | 6.7 | 2.1 | 6.7 | 2.1 | 10.8 | 19.1 | 10.2 |
| 28-Jan-94 | 1.2 | 1.857 | 139 | 19.7 | 2.9 | 8.0 | 2.5 | 8.0 | 2.5 | 12.9 | 22.8 | 11.1 |
| 29-Jan-94 | 1.2 | 1.857 | 135 | 19.2 | 2.8 | 7.8 | 2.5 | 7.8 | 2.5 | 12.6 | 22.3 | 11.8 |
| 30-Jan-94 | 1.2 | 1.857 | 135 | 19.2 | 2.8 | 7.8 | 2.5 | 7.8 | 2.5 | 12.6 | 22.3 | 12.2 |
| 31-Jan-94 | 1.2 | 1.857 | 135 | 19.2 | 2.8 | 7.8 | 2.5 | 7.8 | 2.5 | 12.6 | 22.3 | 12.7 |
| 01-Feb-94 | 1.2 | 1.857 | 137 | 19.4 | 2.8 | 7.9 | 2.5 | 7.9 | 2.5 | 12.7 | 22.6 | 12.6 |
| 02-Feb-94 | 1.1 | 1.702 | 132 | 20.4 | 2.9 | 8.4 | 2.6 | 8.4 | 2.6 | 13.5 | 23.9 | 12.8 |
| 03-Feb-94 | 1.1 | 1.702 | 136 | 21.0 | 3.0 | 8.6 | 2.7 | 8.6 | 2.7 | 13.8 | 24.4 | 13.1 |
| 04-Feb-94 | 1.1 | 1.702 | 134 | 20.7 | 3.0 | 8.5 | 2.7 | 8.5 | 2.7 | 13.6 | 24.2 | 13.4 |
| 05-Feb-94 | 1.1 | 1.702 | 136 | 21.0 | 3.0 | 8.6 | 2.7 | 8.6 | 2.7 | 13.8 | 24.4 | 13.7 |
| 06-Feb-94 | 1 | 1.547 | 135 | 22.8 | 3.2 | 9.3 | 3.0 | 9.3 | 3.0 | 15.0 | 26.7 | 14.1 |
| 07-Feb-94 | 1.1 | 1.702 | 135 | 20.8 | 3.0 | 8.5 | 2.7 | 8.5 | 2.7 | 13.7 | 24.3 | 14.0 |
| 08-Feb-94 | 1.1 | 1.702 | 137 | 21.1 | 3.0 | 8.6 | 2.7 | 8.6 | 2.7 | 13.9 | 24.6 | 14.1 |
| 09-Feb-94 | 1.1 | 1.702 | 140 | 21.6 | 3.1 | 8.8 | 2.8 | 8.8 | 2.8 | 14.1 | 25.0 | 14.2 |
| 10-Feb-94 | 1.1 | 1.702 | 135 | 20.8 | 3.0 | 8.5 | 2.7 | 8.5 | 2.7 | 13.7 | 24.3 | 13.8 |
| 11-Feb-94 | 1 | 1.547 | 134 | 22.7 | 3.2 | 9.3 | 2.9 | 9.3 | 2.9 | 15.0 | 26.5 | 14.2 |
| 12-Feb-94 | 1.1 | 1.702 | 132 | 20.4 | 2.9 | 8.4 | 2.6 | 8.4 | 2.6 | 13.5 | 23.9 | 14.1 |
| 13-Feb-94 | 1.3 | 2.011 | 137 | 18.0 | 2.7 | 7.3 | 2.3 | 7.3 | 2.3 | 11.8 | 20.9 | 13.5 |
| 14-Feb-94 | 1.2 | 1.857 | 134 | 19.0 | 2.8 | 7.8 | 2.5 | 7.8 | 2.5 | 12.5 | 22.2 | 13.2 |
| 15-Feb-94 | 1.3 | 2.011 | 138 | 18.2 | 2.7 | 7.3 | 2.3 | 7.3 | 2.3 | 11.8 | 21.0 | 12.4 |
| 16-Feb-94 | 1.3 | 2.011 | 135 | 17.8 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.6 | 11.9 |
| 17-Feb-94 | 2.2 | 3.404 | 151 | 12.1 | 2.1 | 4.7 | 1.5 | 4.7 | 1.5 | 7.6 | 13.4 | 10.9 |
| 18-Feb-94 | 1.6 | 2.476 | 143 | 15.4 | 2.4 | 6.1 | 1.9 | 6.1 | 1.9 | 9.9 | 17.6 | 10.2 |
| 19-Feb-94 | 1.4 | 2.166 | 145 | 17.7 | 2.7 | 7.1 | 2.2 | 7.1 | 2.2 | 11.4 | 20.3 | 10.2 |
| 20-Feb-94 | 1.3 | 2.011 | 133 | 17.5 | 2.7 | 7.1 | 2.3 | 7.1 | 2.3 | 11.5 | 20.4 | 10.1 |
| 21-Feb-94 | 1.4 | 2.166 | 137 | 16.8 | 2.6 | 6.8 | 2.1 | 6.8 | 2.1 | 10.9 | 19.4 | 11.0 |
| 22-Feb-94 | 1.7 | 2.630 | 135 | 13.8 | 2.3 | 5.5 | 1.7 | 5.5 | 1.7 | 8.9 | 15.8 | 10.7 |
| 23-Feb-94 | 2 | 3.094 | 151 | 13.2 | 2.2 | 5.1 | 1.6 | 5.1 | 1.6 | 8.3 | 14.8 | 9.9 |
| 24-Feb-94 | 2.3 | 3.559 | 130 | 10.1 | 1.9 | 4.0 | 1.3 | 4.0 | 1.3 | 6.5 | 11.5 | 8.7 |
| 25-Feb-94 | 2 | 3.094 | 137 | 12.1 | 2.1 | 4.8 | 1.5 | 4.8 | 1.5 | 7.7 | 13.7 | 7.9 |
| 26-Feb-94 | 3 | 4.642 | 149 | 9.0 | 1.8 | 3.4 | 1.1 | 3.4 | 1.1 | 5.6 | 9.8 | 7.0 |
| 27-Feb-94 | 2.1 | 3.249 | 144 | 12.1 | 2.1 | 4.7 | 1.5 | 4.7 | 1.5 | 7.7 | 13.6 | 6.9 |
| 28-Feb-94 | 1.8 | 2.785 | 170 | 16.3 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.1 | 18.0 | 7.8 |
| 01-Mar-94 | 1.6 | 2.476 | 253 | 26.6 | 3.6 | 9.7 | 3.1 | 9.7 | 3.1 | 15.6 | 27.6 | 9.7 |
| 02-Mar-94 | 2.6 | 4.023 | 351 | 22.8 | 3.2 | 7.8 | 2.5 | 7.8 | 2.5 | 12.5 | 22.2 | 11.5 |
| 03-Mar-94 | 3.4 | 5.260 | 1480 | 71.3 | 8.0 | 18.8 | 5.9 | 18.8 | 5.9 | 30.1 | 53.5 | 17.1 |
| 04-Mar-94 | 2.6 | 4.023 | 1250 | 78.7 | 8.8 | 21.4 | 6.8 | 21.4 | 6.8 | 34.4 | 61.1 | 23.1 |
| 05-Mar-94 | 1.9 | 2.940 | 563 | 48.9 | 5.8 | 15.4 | 4.9 | 15.4 | 4.9 | 24.8 | 44.1 | 25.5 |
| 06-Mar-94 | 1.7 | 2.630 | 183 | 18.4 | 2.7 | 7.0 | 2.2 | 7.0 | 2.2 | 11.4 | 20.1 | 25.2 |
| 07-Mar-94 | 1.5 | 2.321 | 146 | 16.7 | 2.6 | 6.7 | 2.1 | 6.7 | 2.1 | 10.8 | 19.0 | 20.3 |
| 08-Mar-94 | 1.4 | 2.166 | 151 | 18.4 | 2.7 | 7.3 | 2.3 | 7.3 | 2.3 | 11.8 | 20.9 | 14.7 |
| 09-Mar-94 | 1.4 | 2.166 | 146 | 17.9 | 2.7 | 7.1 | 2.3 | 7.1 | 2.3 | 11.5 | 20.4 | 11.4 |
| 10-Mar-94 | 1.5 | 2.321 | 150 | 17.2 | 2.6 | 6.8 | 2.2 | 6.8 | 2.2 | 11.0 | 19.5 | 11.3 |
| 11-Mar-94 | 1.4 | 2.166 | 149 | 18.2 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.7 | 20.7 | 11.5 |
| 12-Mar-94 | 1.3 | 2.011 | 145 | 19.0 | 2.8 | 7.6 | 2.4 | 7.6 | 2.4 | 12.3 | 21.8 | 11.6 |
| 13-Mar-94 | 1.3 | 2.011 | 152 | 19.9 | 2.9 | 7.9 | 2.5 | 7.9 | 2.5 | 12.8 | 22.6 | 11.9 |
| 14-Mar-94 | 1.4 | 2.166 | 143 | 17.5 | 2.7 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 20.1 | 12.0 |
| 15-Mar-94 | 1.3 | 2.011 | 146 | 19.1 | 2.8 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 21.9 | 12.2 |
| 16-Mar-94 | 1.5 | 2.321 | 145 | 16.6 | 2.6 | 6.6 | 2.1 | 6.6 | 2.1 | 10.7 | 18.9 | 11.8 |
| 17-Mar-94 | 1.9 | 2.940 | 149 | 13.7 | 2.3 | 5.4 | 1.7 | 5.4 | 1.7 | 8.7 | 15.4 | 10.8 |
| 18-Mar-94 | 2.4 | 3.713 | 172 | 12.6 | 2.2 | 4.8 | 1.5 | 4.8 | 1.5 | 7.7 | 13.7 | 9.9 |
| 19-Mar-94 | 1.7 | 2.630 | 149 | 15.2 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.7 | 17.1 | 9.2 |
| 20-Mar-94 | 2 | 3.094 | 153 | 13.4 | 2.2 | 5.2 | 1.6 | 5.2 | 1.6 | 8.4 | 14.9 | 8.6 |
| 21-Mar-94 | 2.1 | 3.249 | 156 | 13.0 | 2.2 | 5.0 | 1.6 | 5.0 | 1.6 | 8.2 | 14.4 | 8.5 |
| 22-Mar-94 | 1.9 | 2.940 | 148 | 13.6 | 2.3 | 5.3 | 1.7 | 5.3 | 1.7 | 8.6 | 15.3 | 8.7 |
| 23-Mar-94 | 1.7 | 2.630 | 145 | 14.8 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.5 | 16.8 | 8.7 |
| 24-Mar-94 | 1.5 | 2.321 | 146 | 16.7 | 2.6 | 6.7 | 2.1 | 6.7 | 2.1 | 10.8 | 19.0 | 9.3 |
| 25-Mar-94 | 1.4 | 2.166 | 143 | 17.5 | 2.7 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 20.1 | 10.0 |
| 26-Mar-94 | 1.3 | 2.011 | 144 | 18.9 | 2.8 | 7.6 | 2.4 | 7.6 | 2.4 | 12.2 | 21.7 | 10.9 |
| 27-Mar-94 | 1.3 | 2.011 | 150 | 19.6 | 2.9 | 7.8 | 2.5 | 7.8 | 2.5 | 12.6 | 22.4 | 11.7 |
| 28-Mar-94 | 1.4 | 2.166 | 150 | 18.3 | 2.7 | 7.3 | 2.3 | 7.3 | 2.3 | 11.8 | 20.8 | 12.0 |
| 29-Mar-94 | 1.1 | 1.702 | 157 | 24.1 | 3.3 | 9.6 | 3.0 | 9.6 | 3.0 | 15.4 | 27.4 | 13.0 |
| 30-Mar-94 | 1.1 | 1.702 | 142 | 21.9 | 3.1 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.3 | 13.5 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season.

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mg/L, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs) | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mg/L) | Acute (mg/L) | Chronic (mg/L) |
| 31-Mar-94 | 1.1 | 1.702 | 142 | 21.9 | 3.1 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.3 | 13.9 |
| 01-Apr-94 | 1.1 | 1.702 | 147 | 22.6 | 3.2 | 9.1 | 2.9 | 9.1 | 2.9 | 14.7 | 26.0 | 14.7 |
| 02-Apr-94 | 1 | 1.547 | 149 | 25.1 | 3.4 | 10.1 | 3.2 | 10.1 | 3.2 | 16.3 | 28.9 | 14.9 |
| 03-Apr-94 | 1.1 | 1.702 | 147 | 22.6 | 3.2 | 9.1 | 2.9 | 9.1 | 2.9 | 14.7 | 26.0 | 15.0 |
| 04-Apr-94 | 1.1 | 1.702 | 143 | 22.0 | 3.1 | 8.9 | 2.8 | 8.9 | 2.8 | 14.3 | 25.4 | 15.0 |
| 05-Apr-94 | 1.2 | 1.857 | 147 | 20.8 | 3.0 | 8.3 | 2.6 | 8.3 | 2.6 | 13.5 | 23.9 | 14.7 |
| 06-Apr-94 | 1.5 | 2.321 | 151 | 17.3 | 2.6 | 6.8 | 2.2 | 6.8 | 2.2 | 11.0 | 19.6 | 13.4 |
| 07-Apr-94 | 1.5 | 2.321 | 144 | 16.5 | 2.6 | 6.6 | 2.1 | 6.6 | 2.1 | 10.8 | 18.8 | 12.4 |
| 08-Apr-94 | 1.9 | 2.940 | 165 | 15.0 | 2.4 | 5.8 | 1.8 | 5.8 | 1.8 | 9.4 | 16.6 | 11.1 |
| 09-Apr-94 | 1.5 | 2.321 | 157 | 17.9 | 2.7 | 7.1 | 2.2 | 7.1 | 2.2 | 11.4 | 20.2 | 10.6 |
| 10-Apr-94 | 1.4 | 2.166 | 162 | 19.7 | 2.9 | 7.7 | 2.4 | 7.7 | 2.4 | 12.5 | 22.1 | 11.0 |
| 11-Apr-94 | 1.4 | 2.166 | 143 | 17.5 | 2.7 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 20.1 | 11.1 |
| 12-Apr-94 | 1.7 | 2.630 | 160 | 16.2 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.2 | 18.1 | 11.4 |
| 13-Apr-94 | 1.5 | 2.321 | 145 | 16.6 | 2.6 | 6.6 | 2.1 | 6.6 | 2.1 | 10.7 | 18.9 | 11.2 |
| 14-Apr-94 | 1.4 | 2.166 | 141 | 17.3 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.2 | 19.8 | 10.9 |
| 15-Apr-94 | 1.3 | 2.011 | 145 | 19.0 | 2.8 | 7.6 | 2.4 | 7.6 | 2.4 | 12.3 | 21.8 | 11.1 |
| 16-Apr-94 | 1.3 | 2.011 | 153 | 20.0 | 2.9 | 8.0 | 2.5 | 8.0 | 2.5 | 12.8 | 22.8 | 11.8 |
| 17-Apr-94 | 1.2 | 1.857 | 156 | 21.9 | 3.1 | 8.7 | 2.8 | 8.7 | 2.8 | 14.0 | 24.9 | 12.6 |
| 18-Apr-94 | 1.3 | 2.011 | 152 | 19.9 | 2.9 | 7.9 | 2.5 | 7.9 | 2.5 | 12.8 | 22.6 | 13.0 |
| 19-Apr-94 | 1.2 | 1.857 | 195 | 27.3 | 3.6 | 10.5 | 3.3 | 10.5 | 3.3 | 16.8 | 29.8 | 14.1 |
| 20-Apr-94 | 1.3 | 2.011 | 205 | 26.5 | 3.5 | 10.0 | 3.2 | 10.0 | 3.2 | 16.2 | 28.7 | 14.9 |
| 21-Apr-94 | 1.6 | 2.476 | 236 | 24.8 | 3.4 | 9.1 | 2.9 | 9.1 | 2.9 | 14.7 | 26.1 | 15.1 |
| 22-Apr-94 | 1.4 | 2.166 | 223 | 26.7 | 3.6 | 10.0 | 3.2 | 10.0 | 3.2 | 16.1 | 28.5 | 16.0 |
| 23-Apr-94 | 1.3 | 2.011 | 185 | 24.0 | 3.3 | 9.3 | 2.9 | 9.3 | 2.9 | 14.9 | 26.4 | 15.5 |
| 24-Apr-94 | 1.3 | 2.011 | 395 | 50.1 | 5.9 | 17.0 | 5.4 | 17.0 | 5.4 | 27.3 | 48.4 | 18.2 |
| 25-Apr-94 | 1.2 | 1.857 | 369 | 50.7 | 6.0 | 17.4 | 5.5 | 17.4 | 5.5 | 27.9 | 49.6 | 21.5 |
| 26-Apr-94 | 1.2 | 1.857 | 368 | 50.6 | 6.0 | 17.4 | 5.5 | 17.4 | 5.5 | 27.9 | 49.5 | 24.5 |
| 27-Apr-94 | 1.1 | 1.702 | 367 | 54.9 | 6.4 | 18.9 | 6.0 | 18.9 | 6.0 | 30.3 | 53.9 | 28.4 |
| 28-Apr-94 | 1.2 | 1.857 | 379 | 52.0 | 6.1 | 17.8 | 5.6 | 17.8 | 5.6 | 28.5 | 50.7 | 28.7 |
| 29-Apr-94 | 1.3 | 2.011 | 381 | 48.4 | 5.7 | 16.5 | 5.2 | 16.5 | 5.2 | 26.5 | 47.0 | 28.3 |
| 30-Apr-94 | 1.1 | 1.702 | 186 | 28.3 | 3.7 | 11.0 | 3.5 | 11.0 | 3.5 | 17.7 | 31.3 | 25.8 |
| 01-Nov-94 | 1.9 | 2.940 | 1910 | 163.4 | 17.2 | 41.2 | 13.0 | 41.2 | 13.0 | 66.0 | 117.3 | |
| 02-Nov-94 | 1.6 | 2.476 | 1770 | 179.8 | 18.9 | 46.0 | 14.5 | 46.0 | 14.5 | 73.7 | 131.0 | |
| 03-Nov-94 | 1.6 | 2.476 | 1040 | 106.0 | 11.5 | 30.0 | 9.5 | 30.0 | 9.5 | 48.1 | 85.5 | |
| 04-Nov-94 | 1.9 | 2.940 | 170 | 15.5 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.6 | 17.0 | 49.3 |
| 05-Nov-94 | 1.6 | 2.476 | 141 | 15.2 | 2.4 | 6.1 | 1.9 | 6.1 | 1.9 | 9.8 | 17.4 | 35.3 |
| 06-Nov-94 | 1.6 | 2.476 | 140 | 15.1 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.8 | 17.3 | 19.3 |
| 07-Nov-94 | 1.5 | 2.321 | 136 | 15.7 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.2 | 18.0 | 9.8 |
| 08-Nov-94 | 1.5 | 2.321 | 133 | 15.3 | 2.4 | 6.2 | 2.0 | 6.2 | 2.0 | 10.0 | 17.7 | 9.9 |
| 09-Nov-94 | 1.6 | 2.476 | 132 | 14.3 | 2.3 | 5.8 | 1.8 | 5.8 | 1.8 | 9.3 | 16.5 | 9.8 |
| 10-Nov-94 | 1.5 | 2.321 | 128 | 14.8 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.7 | 17.2 | 9.8 |
| 11-Nov-94 | 1.5 | 2.321 | 129 | 14.9 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.8 | 17.3 | 9.7 |
| 12-Nov-94 | 1.2 | 1.857 | 128 | 18.2 | 2.7 | 7.5 | 2.4 | 7.5 | 2.4 | 12.1 | 21.4 | 10.2 |
| 13-Nov-94 | 1.4 | 2.166 | 127 | 15.7 | 2.5 | 6.4 | 2.0 | 6.4 | 2.0 | 10.3 | 18.3 | 10.5 |
| 14-Nov-94 | 1.5 | 2.321 | 129 | 14.9 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.8 | 17.3 | 10.5 |
| 15-Nov-94 | 1.7 | 2.630 | 131 | 13.5 | 2.2 | 5.4 | 1.7 | 5.4 | 1.7 | 8.7 | 15.5 | 10.2 |
| 16-Nov-94 | 2.2 | 3.404 | 142 | 11.4 | 2.0 | 4.5 | 1.4 | 4.5 | 1.4 | 7.2 | 12.8 | 9.0 |
| 17-Nov-94 | 1.8 | 2.785 | 132 | 12.8 | 2.2 | 5.1 | 1.6 | 5.1 | 1.6 | 8.3 | 14.7 | 8.5 |
| 18-Nov-94 | 1.6 | 2.476 | 136 | 14.7 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.5 | 16.9 | 8.5 |
| 19-Nov-94 | 2 | 3.094 | 144 | 12.6 | 2.2 | 5.0 | 1.6 | 5.0 | 1.6 | 8.0 | 14.2 | 8.3 |
| 20-Nov-94 | 2 | 3.094 | 180 | 15.5 | 2.5 | 5.9 | 1.9 | 5.9 | 1.9 | 9.6 | 16.9 | 8.9 |
| 21-Nov-94 | 1.7 | 2.630 | 142 | 14.5 | 2.3 | 5.8 | 1.8 | 5.8 | 1.8 | 9.3 | 16.5 | 9.1 |
| 22-Nov-94 | 1.7 | 2.630 | 133 | 13.6 | 2.3 | 5.5 | 1.7 | 5.5 | 1.7 | 8.8 | 15.7 | 8.9 |
| 23-Nov-94 | 1.7 | 2.630 | 133 | 13.6 | 2.3 | 5.5 | 1.7 | 5.5 | 1.7 | 8.8 | 15.7 | 9.1 |
| 24-Nov-94 | 1.5 | 2.321 | 130 | 15.0 | 2.4 | 6.1 | 1.9 | 6.1 | 1.9 | 9.8 | 17.4 | 9.2 |
| 25-Nov-94 | 2.2 | 3.404 | 136 | 11.0 | 2.0 | 4.3 | 1.4 | 4.3 | 1.4 | 7.0 | 12.4 | 8.6 |
| 26-Nov-94 | 2.6 | 4.023 | 140 | 9.7 | 1.9 | 3.8 | 1.2 | 3.8 | 1.2 | 6.1 | 10.8 | 7.9 |
| 27-Nov-94 | 2.1 | 3.249 | 136 | 11.5 | 2.0 | 4.5 | 1.4 | 4.5 | 1.4 | 7.3 | 13.0 | 7.6 |
| 28-Nov-94 | 1.8 | 2.785 | 137 | 13.3 | 2.2 | 5.3 | 1.7 | 5.3 | 1.7 | 8.5 | 15.2 | 7.3 |
| 29-Nov-94 | 2.6 | 4.023 | 152 | 10.4 | 1.9 | 4.0 | 1.3 | 4.0 | 1.3 | 6.5 | 11.5 | 7.1 |
| 30-Nov-94 | 4.5 | 6.962 | 1590 | 58.1 | 6.7 | 15.0 | 4.8 | 15.0 | 4.8 | 24.2 | 42.9 | 11.6 |
| 01-Dec-94 | 3.5 | 5.415 | 1800 | 84.1 | 9.3 | 21.3 | 6.7 | 21.3 | 6.7 | 34.2 | 60.8 | 18.4 |
| 02-Dec-94 | 2.8 | 4.332 | 2270 | 132.0 | 14.1 | 32.1 | 10.2 | 32.1 | 10.2 | 51.5 | 91.5 | 29.1 |
| 03-Dec-94 | 2 | 3.094 | 2030 | 165.0 | 17.4 | 41.1 | 13.0 | 41.1 | 13.0 | 65.8 | 117.0 | 43.9 |
| 04-Dec-94 | 1.8 | 2.785 | 1740 | 157.2 | 16.6 | 40.3 | 12.8 | 40.3 | 12.8 | 64.6 | 114.9 | 54.0 |
| 05-Dec-94 | 1.6 | 2.476 | 918 | 93.7 | 10.3 | 27.1 | 8.6 | 27.1 | 8.6 | 43.5 | 77.3 | 56.4 |
| 06-Dec-94 | 1.7 | 2.630 | 253 | 25.0 | 3.4 | 9.1 | 2.9 | 9.1 | 2.9 | 14.7 | 26.0 | 47.2 |
| 07-Dec-94 | 1.5 | 2.321 | 296 | 32.9 | 4.2 | 11.7 | 3.7 | 11.7 | 3.7 | 18.8 | 33.4 | 35.4 |
| 08-Dec-94 | 1.6 | 2.476 | 189 | 20.1 | 2.9 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 21.9 | 22.3 |
| 09-Dec-94 | 1.6 | 2.476 | 173 | 18.5 | 2.7 | 7.1 | 2.3 | 7.1 | 2.3 | 11.5 | 20.4 | 14.3 |
| 10-Dec-94 | 1.6 | 2.476 | 154 | 16.6 | 2.6 | 6.5 | 2.1 | 6.5 | 2.1 | 10.5 | 18.6 | 13.3 |
| 11-Dec-94 | 1.6 | 2.476 | 148 | 15.9 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.2 | 18.1 | 11.2 |
| 12-Dec-94 | 1.5 | 2.321 | 146 | 16.7 | 2.6 | 6.7 | 2.1 | 6.7 | 2.1 | 10.8 | 19.0 | 10.8 |
| 13-Dec-94 | 1.5 | 2.321 | 140 | 16.1 | 2.5 | 6.4 | 2.0 | 6.4 | 2.0 | 10.4 | 18.4 | 10.5 |
| 14-Dec-94 | 1.5 | 2.321 | 136 | 15.7 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.2 | 18.0 | 10.4 |
| 15-Dec-94 | 1.6 | 2.476 | 136 | 14.7 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.5 | 16.9 | 10.2 |
| 16-Dec-94 | 2.2 | 3.404 | 155 | 12.4 | 2.1 | 4.8 | 1.5 | 4.8 | 1.5 | 7.8 | 13.7 | 9.5 |
| 17-Dec-94 | 2.5 | 3.868 | 259 | 17.7 | 2.7 | 6.3 | 2.0 | 6.3 | 2.0 | 10.2 | 18.1 | 9.4 |
| 18-Dec-94 | 2 | 3.094 | 285 | 22.4 | 3.1 | 8.0 | 2.5 | 8.0 | 2.5 | 13.0 | 23.0 | 10.1 |
| 19-Dec-94 | 2 | 3.094 | 222 | 18.9 | 2.8 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 20.0 | 10.6 |
| 20-Dec-94 | 4.4 | 6.808 | 392 | 15.4 | 2.4 | 5.0 | 1.6 | 5.0 | 1.6 | 8.2 | 14.4 | 10.7 |
| 21-Dec-94 | 2.8 | 4.332 | 384 | 23.2 | 3.2 | 7.7 | 2.4 | 7.7 | 2.4 | 12.5 | 22.1 | 11.2 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mg/NL, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs): | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mg/NL) | Acute (mg/NL) | Chronic (mg/NL) |
| 22-Dec-94 | 2.2 | 3.404 | 262 | 20.2 | 2.9 | 7.3 | 2.3 | 7.3 | 2.3 | 11.7 | 20.7 | 10.9 |
| 23-Dec-94 | 1.9 | 2.940 | 238 | 21.2 | 3.0 | 7.8 | 2.5 | 7.8 | 2.5 | 12.5 | 22.2 | 11.2 |
| 24-Dec-94 | 1.7 | 2.630 | 216 | 21.5 | 3.1 | 8.0 | 2.5 | 8.0 | 2.5 | 12.9 | 22.9 | 12.4 |
| 25-Dec-94 | 2.1 | 3.249 | 191 | 15.7 | 2.5 | 5.9 | 1.9 | 5.9 | 1.9 | 9.6 | 16.9 | 11.7 |
| 26-Dec-94 | 4.7 | 7.272 | 409 | 15.1 | 2.4 | 4.9 | 1.5 | 4.9 | 1.5 | 7.9 | 14.0 | 10.7 |
| 27-Dec-94 | 3.7 | 5.725 | 1840 | 81.4 | 9.0 | 20.5 | 6.5 | 20.5 | 6.5 | 33.0 | 58.6 | 15.8 |
| 28-Dec-94 | 2.5 | 3.868 | 4470 | 289.9 | 29.9 | 62.0 | 19.6 | 62.0 | 19.6 | 99.3 | 176.6 | 37.4 |
| 29-Dec-94 | 2.1 | 3.249 | 4280 | 330.3 | 33.9 | 71.3 | 22.5 | 71.3 | 22.5 | 114.1 | 203.0 | 63.6 |
| 30-Dec-94 | 1.8 | 2.785 | 3970 | 357.4 | 36.6 | 78.3 | 24.8 | 78.3 | 24.8 | 125.3 | 222.9 | 92.9 |
| 31-Dec-94 | 1.7 | 2.630 | 3610 | 344.1 | 35.3 | 76.8 | 24.3 | 76.8 | 24.3 | 122.9 | 218.6 | 115.4 |
| 01-Jan-95 | 1.6 | 2.476 | 2180 | 221.2 | 23.0 | 54.4 | 17.2 | 54.4 | 17.2 | 87.1 | 154.8 | 112.4 |
| 02-Jan-95 | 1.7 | 2.630 | 1240 | 118.9 | 12.8 | 32.5 | 10.3 | 32.5 | 10.3 | 52.1 | 92.6 | 96.9 |
| 03-Jan-95 | 1.6 | 2.476 | 1130 | 115.1 | 12.4 | 32.1 | 10.1 | 32.1 | 10.1 | 51.4 | 91.3 | 78.4 |
| 04-Jan-95 | 1.6 | 2.476 | 1040 | 106.0 | 11.5 | 30.0 | 9.5 | 30.0 | 9.5 | 48.1 | 85.5 | 59.7 |
| 05-Jan-95 | 1.6 | 2.476 | 1170 | 119.2 | 12.8 | 33.0 | 10.4 | 33.0 | 10.4 | 52.8 | 93.9 | 51.1 |
| 06-Jan-95 | 1.5 | 2.321 | 1190 | 129.2 | 13.8 | 35.6 | 11.3 | 35.6 | 11.3 | 57.1 | 101.5 | 52.4 |
| 07-Jan-95 | 1.5 | 2.321 | 1130 | 122.7 | 13.2 | 34.2 | 10.8 | 34.2 | 10.8 | 54.8 | 97.4 | 53.2 |
| 08-Jan-95 | 1.5 | 2.321 | 1100 | 119.5 | 12.8 | 33.5 | 10.6 | 33.5 | 10.6 | 53.6 | 95.3 | 54.6 |
| 09-Jan-95 | 1.6 | 2.476 | 800 | 81.8 | 9.1 | 24.3 | 7.7 | 24.3 | 7.7 | 39.0 | 69.2 | 51.1 |
| 10-Jan-95 | 1.8 | 2.785 | 456 | 41.9 | 5.1 | 13.8 | 4.4 | 13.8 | 4.4 | 22.1 | 39.3 | 42.4 |
| 11-Jan-95 | 1.6 | 2.476 | 413 | 42.7 | 5.2 | 14.3 | 4.5 | 14.3 | 4.5 | 23.0 | 40.8 | 34.4 |
| 12-Jan-95 | 1.7 | 2.630 | 411 | 40.1 | 4.9 | 13.4 | 4.2 | 13.4 | 4.2 | 21.6 | 38.3 | 26.4 |
| 13-Jan-95 | 1.8 | 2.785 | 385 | 35.6 | 4.5 | 12.0 | 3.8 | 12.0 | 3.8 | 19.3 | 34.3 | 21.5 |
| 14-Jan-95 | 1.7 | 2.630 | 352 | 34.5 | 4.3 | 11.8 | 3.7 | 11.8 | 3.7 | 19.1 | 33.8 | 20.7 |
| 15-Jan-95 | 1.9 | 2.940 | 390 | 34.2 | 4.3 | 11.5 | 3.6 | 11.5 | 3.6 | 18.5 | 32.9 | 19.6 |
| 16-Jan-95 | 1.9 | 2.940 | 414 | 36.2 | 4.5 | 12.1 | 3.8 | 12.1 | 3.8 | 19.4 | 34.5 | 19.1 |
| 17-Jan-95 | 1.9 | 2.940 | 376 | 33.0 | 4.2 | 11.2 | 3.5 | 11.2 | 3.5 | 18.0 | 31.9 | 18.8 |
| 18-Jan-95 | 2. | 3.094 | 344 | 28.8 | 3.8 | 9.9 | 3.1 | 9.9 | 3.1 | 15.9 | 28.3 | 18.0 |
| 19-Jan-95 | 1.8 | 2.785 | 252 | 23.6 | 3.3 | 8.6 | 2.7 | 8.6 | 2.7 | 13.8 | 24.5 | 16.8 |
| 20-Jan-95 | 1.7 | 2.630 | 164 | 16.6 | 2.6 | 6.5 | 2.0 | 6.5 | 2.0 | 10.4 | 18.5 | 14.5 |
| 21-Jan-95 | 1.6 | 2.476 | 137 | 14.8 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.6 | 17.0 | 12.4 |
| 22-Jan-95 | 1.5 | 2.321 | 138 | 15.9 | 2.5 | 6.4 | 2.0 | 6.4 | 2.0 | 10.3 | 18.2 | 11.0 |
| 23-Jan-95 | 1.5 | 2.321 | 139 | 16.0 | 2.5 | 6.4 | 2.0 | 6.4 | 2.0 | 10.3 | 18.3 | 10.2 |
| 24-Jan-95 | 1.4 | 2.166 | 137 | 16.8 | 2.6 | 6.8 | 2.1 | 6.8 | 2.1 | 10.9 | 19.4 | 10.3 |
| 25-Jan-95 | 1.4 | 2.166 | 138 | 16.9 | 2.6 | 6.8 | 2.2 | 6.8 | 2.2 | 11.0 | 19.5 | 10.6 |
| 26-Jan-95 | 1.4 | 2.166 | 141 | 17.3 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.2 | 19.8 | 10.9 |
| 27-Jan-95 | 1.4 | 2.166 | 139 | 17.0 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.1 | 19.6 | 11.1 |
| 28-Jan-95 | 1.7 | 2.630 | 142 | 14.5 | 2.3 | 5.8 | 1.8 | 5.8 | 1.8 | 9.3 | 16.5 | 10.6 |
| 29-Jan-95 | 1.9 | 2.940 | 169 | 15.4 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.6 | 16.9 | 10.3 |
| 30-Jan-95 | 2.4 | 3.713 | 197 | 14.3 | 2.3 | 5.3 | 1.7 | 5.3 | 1.7 | 8.6 | 15.2 | 9.6 |
| 31-Jan-95 | 2.8 | 4.332 | 935 | 55.0 | 6.4 | 15.8 | 5.0 | 15.8 | 5.0 | 25.3 | 45.0 | 13.2 |
| 01-Feb-95 | 3 | 4.642 | 1700 | 92.6 | 10.2 | 23.8 | 7.5 | 23.8 | 7.5 | 38.1 | 67.7 | 20.4 |
| 02-Feb-95 | 2.2 | 3.404 | 1870 | 138.3 | 14.7 | 35.0 | 11.1 | 35.0 | 11.1 | 56.0 | 99.6 | 32.0 |
| 03-Feb-95 | 1.9 | 2.940 | 1850 | 158.3 | 16.7 | 40.1 | 12.7 | 40.1 | 12.7 | 64.3 | 114.3 | 45.9 |
| 04-Feb-95 | 1.7 | 2.630 | 1740 | 166.4 | 17.5 | 42.7 | 13.5 | 42.7 | 13.5 | 68.4 | 121.6 | 56.7 |
| 05-Feb-95 | 1.7 | 2.630 | 1560 | 149.3 | 15.8 | 39.1 | 12.4 | 39.1 | 12.4 | 62.7 | 111.4 | 62.9 |
| 06-Feb-95 | 1.6 | 2.476 | 1270 | 129.3 | 13.8 | 35.2 | 11.1 | 35.2 | 11.1 | 56.4 | 100.3 | 63.0 |
| 07-Feb-95 | 1.6 | 2.476 | 991 | 101.1 | 11.0 | 28.9 | 9.1 | 28.9 | 9.1 | 46.3 | 82.2 | 58.4 |
| 08-Feb-95 | 1.5 | 2.321 | 463 | 50.9 | 6.0 | 16.7 | 5.3 | 16.7 | 5.3 | 26.8 | 47.7 | 48.1 |
| 09-Feb-95 | 1.5 | 2.321 | 173 | 19.6 | 2.9 | 7.6 | 2.4 | 7.6 | 2.4 | 12.3 | 21.8 | 35.5 |
| 10-Feb-95 | 1.4 | 2.166 | 160 | 19.5 | 2.8 | 7.7 | 2.4 | 7.7 | 2.4 | 12.4 | 21.9 | 24.4 |
| 11-Feb-95 | 1.9 | 2.940 | 170 | 15.5 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.6 | 17.0 | 15.3 |
| 12-Feb-95 | 1.6 | 2.476 | 156 | 16.8 | 2.6 | 6.6 | 2.1 | 6.6 | 2.1 | 10.6 | 18.8 | 11.2 |
| 13-Feb-95 | 1.7 | 2.630 | 148 | 15.1 | 2.4 | 5.9 | 1.9 | 5.9 | 1.9 | 9.6 | 17.0 | 10.6 |
| 14-Feb-95 | 1.6 | 2.476 | 142 | 15.3 | 2.4 | 6.1 | 1.9 | 6.1 | 1.9 | 9.9 | 17.5 | 9.9 |
| 15-Feb-95 | 1.6 | 2.476 | 143 | 15.4 | 2.4 | 6.1 | 1.9 | 6.1 | 1.9 | 9.9 | 17.6 | 10.0 |
| 16-Feb-95 | 1.7 | 2.630 | 138 | 14.1 | 2.3 | 5.6 | 1.8 | 5.6 | 1.8 | 9.1 | 16.1 | 9.6 |
| 17-Feb-95 | 2.1 | 3.249 | 160 | 13.3 | 2.2 | 5.1 | 1.6 | 5.1 | 1.6 | 8.3 | 14.7 | 9.3 |
| 18-Feb-95 | 3.3 | 5.106 | 192 | 10.4 | 1.9 | 3.8 | 1.2 | 3.8 | 1.2 | 6.2 | 10.9 | 8.4 |
| 19-Feb-95 | 4.3 | 6.653 | 1910 | 72.8 | 8.2 | 18.2 | 5.8 | 18.2 | 5.8 | 29.3 | 52.0 | 13.2 |
| 20-Feb-95 | 3.7 | 5.725 | 2420 | 106.7 | 11.6 | 25.6 | 8.1 | 25.6 | 8.1 | 41.1 | 72.9 | 21.2 |
| 21-Feb-95 | 2.6 | 4.023 | 2360 | 147.7 | 15.7 | 35.7 | 11.3 | 35.7 | 11.3 | 57.2 | 101.6 | 33.4 |
| 22-Feb-95 | 2.1 | 3.249 | 2290 | 177.2 | 18.6 | 43.1 | 13.6 | 43.1 | 13.6 | 69.1 | 122.8 | 49.1 |
| 23-Feb-95 | 1.9 | 2.940 | 2200 | 188.1 | 19.7 | 46.1 | 14.6 | 46.1 | 14.6 | 73.9 | 131.4 | 60.3 |
| 24-Feb-95 | 1.9 | 2.940 | 2100 | 179.6 | 18.9 | 44.4 | 14.1 | 44.4 | 14.1 | 71.2 | 126.6 | 67.8 |
| 25-Feb-95 | 1.8 | 2.785 | 1960 | 176.9 | 18.6 | 44.4 | 14.0 | 44.4 | 14.0 | 71.1 | 126.4 | 71.3 |
| 26-Feb-95 | 1.6 | 2.476 | 1750 | 177.7 | 18.7 | 45.6 | 14.4 | 45.6 | 14.4 | 73.0 | 129.8 | 72.3 |
| 27-Feb-95 | 1.6 | 2.476 | 1030 | 105.0 | 11.4 | 29.8 | 9.4 | 29.8 | 9.4 | 47.7 | 84.8 | 65.7 |
| 28-Feb-95 | 1.5 | 2.321 | 297 | 33.0 | 4.2 | 11.7 | 3.7 | 11.7 | 3.7 | 18.8 | 33.4 | 52.7 |
| 01-Mar-95 | 1.5 | 2.321 | 179 | 20.3 | 2.9 | 7.8 | 2.5 | 7.8 | 2.5 | 12.6 | 22.4 | 38.0 |
| 02-Mar-95 | 1.5 | 2.321 | 194 | 21.9 | 3.1 | 8.3 | 2.6 | 8.3 | 2.6 | 13.4 | 23.8 | 23.2 |
| 03-Mar-95 | 1.4 | 2.166 | 175 | 21.2 | 3.0 | 8.2 | 2.6 | 8.2 | 2.6 | 13.3 | 23.5 | 14.5 |
| 04-Mar-95 | 1.5 | 2.321 | 174 | 19.7 | 2.9 | 7.7 | 2.4 | 7.7 | 2.4 | 12.3 | 21.9 | 12.9 |
| 05-Mar-95 | 1.5 | 2.321 | 181 | 20.5 | 2.9 | 7.9 | 2.5 | 7.9 | 2.5 | 12.7 | 22.6 | 12.9 |
| 06-Mar-95 | 1.4 | 2.166 | 765 | 89.3 | 9.8 | 26.8 | 8.5 | 26.8 | 8.5 | 42.9 | 76.3 | 20.3 |
| 07-Mar-95 | 1.4 | 2.166 | 1450 | 168.4 | 17.7 | 44.8 | 14.2 | 44.8 | 14.2 | 71.7 | 127.5 | 34.9 |
| 08-Mar-95 | 1.8 | 2.785 | 575 | 52.6 | 6.2 | 16.6 | 5.2 | 16.6 | 5.2 | 26.6 | 47.3 | 38.5 |
| 09-Mar-95 | 2.5 | 3.868 | 195 | 13.6 | 2.3 | 5.1 | 1.6 | 5.1 | 1.6 | 8.2 | 14.5 | 37.4 |
| 10-Mar-95 | 2.2 | 3.404 | 194 | 15.2 | 2.4 | 5.7 | 1.8 | 5.7 | 1.8 | 9.2 | 16.4 | 28.9 |
| 11-Mar-95 | 2.6 | 4.023 | 199 | 13.4 | 2.2 | 4.9 | 1.6 | 4.9 | 1.6 | 8.0 | 14.2 | 13.0 |
| 12-Mar-95 | 2.3 | 3.559 | 227 | 16.9 | 2.6 | 6.2 | 2.0 | 6.2 | 2.0 | 10.0 | 17.7 | 8.9 |
| 13-Mar-95 | 2.1 | 3.249 | 200 | 16.4 | 2.5 | 6.1 | 1.9 | 6.1 | 1.9 | 9.9 | 17.5 | 9.3 |
| 14-Mar-95 | 2 | 3.094 | 188 | 16.2 | 2.5 | 6.1 | 1.9 | 6.1 | 1.9 | 9.9 | 17.5 | 9.5 |

Continuous simulation of Enumclaw Waste Load Allocations for ammonia during the November-April permit season

| | | | | Maximum Allowable Dilution Factors Based on Percentages of River Flow in WAC 173-201A-100 (25% for Chronic, 2.5% for acute) | | Centerline Dilution Factors Predicted at the Mixing Zone Boundary Using RIVPLUM4 (Equation 5.9 in Fischer et al 1979) | | Selected Limiting Dilution Factor Based on Minimum of RIVPLUM4 Prediction vs Percentage of River Flow | | Continuous Simulation of Ammonia WLAs: Waste Load Allocations For Ammonia Assuming Upstream Ammonia (Ca) = 0.1 mgN/L, WLA=WQS*DF-Ca*(DF-1) | | Continuous Simulation of Ammonia WLAs: WLA Running Averages for 4-day Averaging Period |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Date | Effluent Discharge Rate (mgd) | Effluent Discharge Rate (cfs) | River Discharge Rate at USGS 12100000 (cfs) | Chronic | Acute | Chronic | Acute | Chronic | Acute | Chronic (mgN/L) | Acute (mgN/L) | Chronic (mgN/L) |
| 15-Mar-95 | 1.9 | 2.940 | 184 | 16.6 | 2.6 | 6.3 | 2.0 | 6.3 | 2.0 | 10.2 | 18.1 | 10.0 |
| 16-Mar-95 | 1.8 | 2.785 | 182 | 17.3 | 2.6 | 6.6 | 2.1 | 6.6 | 2.1 | 10.7 | 18.9 | 10.2 |
| 17-Mar-95 | 1.7 | 2.630 | 858 | 82.6 | 9.2 | 24.2 | 7.7 | 24.2 | 7.7 | 38.8 | 69.0 | 17.4 |
| 18-Mar-95 | 2.1 | 3.249 | 1790 | 138.7 | 14.8 | 35.4 | 11.2 | 35.4 | 11.2 | 56.7 | 100.7 | 29.1 |
| 19-Mar-95 | 1.9 | 2.940 | 1190 | 102.2 | 11.1 | 28.2 | 8.9 | 28.2 | 8.9 | 45.1 | 80.2 | 37.8 |
| 20-Mar-95 | 1.6 | 2.476 | 241 | 25.3 | 3.4 | 9.3 | 2.9 | 9.3 | 2.9 | 15.0 | 26.6 | 38.9 |
| 21-Mar-95 | 1.7 | 2.630 | 180 | 18.1 | 2.7 | 6.9 | 2.2 | 6.9 | 2.2 | 11.2 | 19.9 | 32.0 |
| 22-Mar-95 | 1.7 | 2.630 | 300 | 29.5 | 3.9 | 10.4 | 3.3 | 10.4 | 3.3 | 16.8 | 29.8 | 22.0 |
| 23-Mar-95 | 1.9 | 2.940 | 1140 | 97.9 | 10.7 | 27.2 | 8.6 | 27.2 | 8.6 | 43.6 | 77.5 | 21.6 |
| 24-Mar-95 | 1.6 | 2.476 | 176 | 18.8 | 2.8 | 7.2 | 2.3 | 7.2 | 2.3 | 11.7 | 20.7 | 20.8 |
| 25-Mar-95 | 1.5 | 2.321 | 160 | 18.2 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.5 | 20.9 |
| 26-Mar-95 | 1.6 | 2.476 | 156 | 16.8 | 2.6 | 6.6 | 2.1 | 6.6 | 2.1 | 10.6 | 18.8 | 19.4 |
| 27-Mar-95 | 1.6 | 2.476 | 154 | 16.6 | 2.6 | 6.5 | 2.1 | 6.5 | 2.1 | 10.5 | 18.6 | 11.1 |
| 28-Mar-95 | 1.6 | 2.476 | 153 | 16.5 | 2.5 | 6.5 | 2.0 | 6.5 | 2.0 | 10.5 | 18.5 | 10.8 |
| 29-Mar-95 | 1.5 | 2.321 | 150 | 17.2 | 2.6 | 6.8 | 2.2 | 6.8 | 2.2 | 11.0 | 19.5 | 10.7 |
| 30-Mar-95 | 1.6 | 2.476 | 151 | 16.2 | 2.5 | 6.4 | 2.0 | 6.4 | 2.0 | 10.4 | 18.4 | 10.6 |
| 31-Mar-95 | 1.5 | 2.321 | 152 | 17.4 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.1 | 19.7 | 10.7 |
| 01-Apr-95 | 1.6 | 2.476 | 153 | 16.5 | 2.5 | 6.5 | 2.0 | 6.5 | 2.0 | 10.5 | 18.5 | 10.7 |
| 02-Apr-95 | 1.7 | 2.630 | 149 | 15.2 | 2.4 | 6.0 | 1.9 | 6.0 | 1.9 | 9.7 | 17.1 | 10.4 |
| 03-Apr-95 | 1.6 | 2.476 | 147 | 15.8 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.1 | 18.0 | 10.3 |
| 04-Apr-95 | 1.5 | 2.321 | 147 | 16.8 | 2.6 | 6.7 | 2.1 | 6.7 | 2.1 | 10.8 | 19.2 | 10.3 |
| 05-Apr-95 | 1.6 | 2.476 | 148 | 15.9 | 2.5 | 6.3 | 2.0 | 6.3 | 2.0 | 10.2 | 18.1 | 10.2 |
| 06-Apr-95 | 1.5 | 2.321 | 151 | 17.3 | 2.6 | 6.8 | 2.2 | 6.8 | 2.2 | 11.0 | 19.6 | 10.6 |
| 07-Apr-95 | 1.6 | 2.476 | 150 | 16.1 | 2.5 | 6.4 | 2.0 | 6.4 | 2.0 | 10.3 | 18.3 | 10.6 |
| 08-Apr-95 | 1.5 | 2.321 | 154 | 17.6 | 2.7 | 6.9 | 2.2 | 6.9 | 2.2 | 11.2 | 19.9 | 10.7 |
| 09-Apr-95 | 1.5 | 2.321 | 153 | 17.5 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.2 | 19.8 | 10.9 |
| 10-Apr-95 | 1.7 | 2.630 | 154 | 15.6 | 2.5 | 6.1 | 1.9 | 6.1 | 1.9 | 9.9 | 17.6 | 10.6 |
| 11-Apr-95 | 1.9 | 2.940 | 157 | 14.4 | 2.3 | 5.6 | 1.8 | 5.6 | 1.8 | 9.0 | 16.0 | 10.3 |
| 12-Apr-95 | 1.7 | 2.630 | 144 | 14.7 | 2.4 | 5.8 | 1.8 | 5.8 | 1.8 | 9.4 | 16.7 | 9.9 |
| 13-Apr-95 | 1.6 | 2.476 | 152 | 16.4 | 2.5 | 6.4 | 2.0 | 6.4 | 2.0 | 10.4 | 18.5 | 9.7 |
| 14-Apr-95 | 1.4 | 2.166 | 146 | 17.9 | 2.7 | 7.1 | 2.3 | 7.1 | 2.3 | 11.5 | 20.4 | 10.1 |
| 15-Apr-95 | 1.5 | 2.321 | 141 | 16.2 | 2.5 | 6.5 | 2.0 | 6.5 | 2.0 | 10.5 | 18.5 | 10.4 |
| 16-Apr-95 | 1.4 | 2.166 | 140 | 17.2 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.1 | 19.7 | 10.9 |
| 17-Apr-95 | 1.4 | 2.166 | 142 | 17.4 | 2.6 | 7.0 | 2.2 | 7.0 | 2.2 | 11.3 | 19.9 | 11.1 |
| 18-Apr-95 | 1.4 | 2.166 | 145 | 17.7 | 2.7 | 7.1 | 2.2 | 7.1 | 2.2 | 11.4 | 20.3 | 11.1 |
| 19-Apr-95 | 1.4 | 2.166 | 141 | 17.3 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.2 | 19.8 | 11.3 |
| 20-Apr-95 | 1.4 | 2.166 | 147 | 18.0 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.5 | 11.4 |
| 21-Apr-95 | 1.4 | 2.166 | 145 | 17.7 | 2.7 | 7.1 | 2.2 | 7.1 | 2.2 | 11.4 | 20.3 | 11.4 |
| 22-Apr-95 | 1.4 | 2.166 | 147 | 18.0 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.5 | 11.4 |
| 23-Apr-95 | 1.4 | 2.166 | 147 | 18.0 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.6 | 20.5 | 11.5 |
| 24-Apr-95 | 1.5 | 2.321 | 151 | 17.3 | 2.6 | 6.8 | 2.2 | 6.8 | 2.2 | 11.0 | 19.6 | 11.4 |
| 25-Apr-95 | 1.4 | 2.166 | 149 | 18.2 | 2.7 | 7.2 | 2.3 | 7.2 | 2.3 | 11.7 | 20.7 | 11.5 |
| 26-Apr-95 | 1.4 | 2.166 | 139 | 17.0 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.1 | 19.6 | 11.3 |
| 27-Apr-95 | 1.4 | 2.166 | 140 | 17.2 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.1 | 19.7 | 11.2 |
| 28-Apr-95 | 1.5 | 2.321 | 142 | 16.3 | 2.5 | 6.5 | 2.1 | 6.5 | 2.1 | 10.5 | 18.6 | 11.1 |
| 29-Apr-95 | 1.4 | 2.166 | 140 | 17.2 | 2.6 | 6.9 | 2.2 | 6.9 | 2.2 | 11.1 | 19.7 | 11.0 |
| 30-Apr-95 | 1.4 | 2.166 | 137 | 16.8 | 2.6 | 6.8 | 2.1 | 6.8 | 2.1 | 10.9 | 19.4 | 10.9 |

**Minima for Nov-Apr Permiting Periods (mg/L as N):**

| | | |
|---|---|---|
| 1987-88 | 9.64 | 9.64 |
| 1988-89 | 9.57 | 11.14 |
| 1989-90 | 11.48 | 9.42 |
| 1990-91 | 11.19 | 6.72 |
| 1991-92 | 9.14 | 9.47 |
| 1992-93 | 11.38 | 8.11 |
| 1993-94 | 9.85 | 6.86 |
| 1994-95 | 10.78 | 7.12 |

**Log10-transformed Minima for Nov-Apr Periods:**

| | | |
|---|---|---|
| 1987-88 | 0.9842 | 0.9842 |
| 1988-89 | 0.9811 | 1.0468 |
| 1989-90 | 1.0598 | 0.9739 |
| 1990-91 | 1.0488 | 0.8272 |
| 1991-92 | 0.9611 | 0.9764 |
| 1992-93 | 1.0561 | 0.9092 |
| 1993-94 | 0.9933 | 0.8366 |
| 1994-95 | 1.0324 | 0.8527 |

**Summary Statistics of Seasonal Minima in Units of mg/L**

| | | |
|---|---|---|
| Mean | 10.3778 | 8.5606 |
| Standard Deviation | 0.9273 | 1.5996 |
| Mean of Log-transformed values | 1.0146 | 0.9259 |
| Standard Deviation of Log-transformed values | 0.0390 | 0.0813 |
| Annual 3-year return period from normal distribution | 9.54 | 7.12 |
| Annual 3-year return period from log-normal distribution | 9.54 | 7.12 |
| Annual 10-year return period from normal distribution | 8.85 | 5.93 |
| Annual 10-year return period from log-normal distribution | 8.92 | 6.20 |

# Appendix B

Example calculation of dilution factors at the acute and chronic mixing zone boundaries using the RIVPLUM4 spreadsheet.

Spread of a plume from a point source in a river with and without
boundary effects from the shoreline (Fischer et al , 1979)
Calculation check of formulas in 'ENUMFLO3 XLW\Continuous Simulation'
Based on Lotus File RIVPLUM4 WK1, Ecology Permit Writer's Manual

## INPUT

| Data to check calculations on sheet 'Continuous Simulation': | 01-Nov-87 Chronic | 01-Nov-87 Acute | 30-Apr-95 Chronic | 30-Apr-95 Acute |
|---|---|---|---|---|
| 1 Effluent Discharge Rate (cfs): | 1 24 | 1 24 | 2 17 | 2.17 |
| 2 Receiving Water Characteristics Downstream From Waste Input | | | | |
| Flow (cfs) | 157.2 | 157.2 | 139.2 | 139.2 |
| Stream Depth (ft): | 0 866 | 0.866 | 0.835 | 0.835 |
| Stream Velocity (fps): | 1.61 | 1.61 | 1.51 | 1.51 |
| Channel Width (ft): | 112 | 112 | 111 | 111 |
| Stream Slope (ft/ft) or Manning roughness "n": | 0 007 | 0 007 | 0 007 | 0 007 |
| 0 if slope or 1 if Manning "n" in previous cell: | 0 | 0 | 0 | 0 |
| 3. Discharge Distance From Nearest Shoreline (ft): | 0 00 | 0 00 | 0 00 | 0 00 |
| 4. Location of Point of Interest to Estimate Dilution | | | | |
| Distance Downstream to Point of Interest (ft): | 300 00 | 30 00 | 300.00 | 30 00 |
| Distance From Nearest Shoreline (ft): | 0.00 | 0 00 | 0.00 | 0 00 |
| 5. Transverse Mixing Coefficient Constant (usually 0 6): | 0 6 | 0 6 | 0 6 | 0 6 |

## OUTPUT

| | | | | |
|---|---|---|---|---|
| 1 Source Conservative Mass Input Rate | | | | |
| Concentration of Conservative Substance (%): | 100 00 | 100 00 | 100 00 | 100 00 |
| Source Conservative Mass Input Rate (cfs*%): | 123 78 | 123 78 | 216 61 | 216 61 |
| 2. Shear Velocity | | | | |
| Shear Velocity based on slope (ft/sec): | 0 442 | 0 442 | 0 434 | 0.434 |
| Shear Velocity based on Manning "n": | | | | |
| using Prasuhn equations 8-26 and 8-54 assuming | | | | |
| hydraulic radius equals depth for wide channel | | | | |
| Darcy-Weisbach friction factor "f": | #N/A | #N/A | #N/A | #N/A |
| Shear Velocity from Darcy-Weisbach "f" (ft/sec): | #N/A | #N/A | #N/A | #N/A |
| Selected Shear Velocity for next step (ft/sec): | 0 442 | 0 442 | 0 434 | 0.434 |
| 3. Transverse Mixing Coefficient (ft2/sec): | 0 230 | 0 230 | 0 217 | 0.217 |
| 4. Plume Characteristics Assuming No Shoreline Effect | | | | |
| Unbounded Plume Width at Point of Interest (ft): | 36.969 | 11.691 | 37.218 | 11.770 |
| Concentration at Point of Interest (Fischer Eqn 5 7): | 3 82E+00 | 1 21E+01 | 7 38E+00 | 2 33E+01 |
| Calculated Dilution Factor at Point of Interest: | 26 167 | 8 275 | 13 553 | 4 286 |
| 5. Plume Characteristics Accounting for Shoreline Effect | | | | |
| Co: | 7 87E-01 | 7 87E-01 | 1.56E+00 | 1.56E+00 |
| x': | 3.38E-03 | 3.38E-04 | 3.54E-03 | 3.54E-04 |
| y'o: | 0 00E+00 | 0 00E+00 | 0 00E+00 | 0 00E+00 |
| y' at point of interest: | 0.00E+00 | 0.00E+00 | 0 00E+00 | 0 00E+00 |
| Solution using superposition equation (Fischer eqn 5 9) | | | | |
| Term for n= -2 | 0.00E+00 | 0 00E+00 | 0.00E+00 | 0 00E+00 |
| Term for n= -1 | 4.73E-129 | 0.00E+00 | 4.52E-123 | 0 00E+00 |
| Term for n= 0 | 2.00E+00 | 2 00E+00 | 2.00E+00 | 2.00E+00 |
| Term for n= 1 | 4.73E-129 | 0 00E+00 | 4.52E-123 | 0 00E+00 |
| Term for n= 2 | 0 00E+00 | 0 00E+00 | 0 00E+00 | 0 00E+00 |
| C/Co (dimensionless): | 9 71E+00 | 3 07E+01 | 9 48E+00 | 3 00E+01 |
| Concentration at Point of Interest (Fischer Eqn 5 9): | 7 64E+00 | 2.42E+01 | 1.48E+01 | 4 67E+01 |
| Plume half-width (ft) | 18.485 | 5.845 | 18.609 | 5.885 |
| Distance from near shore to discharge point (ft) | 0.00 | 0.00 | 0.00 | 0.00 |
| Distance from far shore to discharge point (ft) | 112 47 | 112.47 | 110 56 | 110 56 |
| Plume width bounded by shoreline (ft) | 18.48 | 5.85 | 18 61 | 5 88 |
| Approximate Downstream Distance to Complete Mix (ft): | 35,541 | 35 541 | 33 888 | 33 888 |
| Theoretical Dilution Factor at Complete Mix: | 127.034 | 127.034 | 64 248 | 64.248 |
| Calculated Flux-Average Dilution Factor Across Entire Plume Width: | 20 878 | 6.602 | 10 814 | 3.420 |
| Calculated Dilution Factor at Point of Interest: | 13 083 | 4.137 | 6 776 | 2.143 |

# Appendix C

Calculation of recommended water quality based permit limits for ammonia based on WLAs from continuous simulation modeling

Recommended water quality-based permit limits for ammonia during November-April
(based on EPA/505/2-90-001 Box 5-2)

Based on Lotus File WQBP2 WK1 Ecology Permit Writer's Manual

| INPUT | Annual 3-year Return Period | Annual 10-year Return Period |
|---|---|---|
| 1 Recommended Waste Load Allocations for November-April from Continuous Simulation | | |
| Acute (one-hour) WLA: | 9 54 | 8 92 |
| Chronic (n1-day) WLA: | 7 12 | 6 20 |
| 2 Coefficient of Variation for Effluent Concentration (use 0 6 if data are not available): | 0 6 | 0 6 |
| 3 Number of days (n1) for chronic average (usually four or seven; four is recommended): | 4 | 4 |
| 4 Number of samples (n2) required per month for monitoring: | 9 | 9 |
| **OUTPUT** | | |
| 1 Z Statistics | | |
| LTA Derivation (99%tile): | 2 326 | 2 326 |
| Daily Maximum Permit Limit (99%tile): | 2 326 | 2 326 |
| Monthly Average Permit Limit (95%tile): | 1 645 | 1 645 |
| 2 Derivation of LTAs using April 1990 TSD (Box 5-2 Step 2 & 3) | | |
| Sigma^2: | 0 3075 | 0 3075 |
| Sigma^2-n1: | 0.0862 | 0.0862 |
| LTA for Acute (1-hour) WLA: | 3 063 | 2 864 |
| LTA for Chronic (n1-day) WLA: | 3 755 | 3 270 |
| Most Limiting LTA (minimum of acute and chronic): | 3 063 | 2 864 |
| 3 Derivation of Permit Limits From Limiting LTA (Box 5-2 Step 4) | | |
| Sigma^2-n2: | 0 0392 | 0 0392 |
| Daily Maximum Permit Limit: | 9 5 | 8 9 |
| Monthly Average Permit Limit: | 4 2 | 3 9 |