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REGION 6 - AMMONIA WATER QUALITY CRITERIA CALCULATOR

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REQUIRED USER INPUTS	
1-h Temp Cap*	20
4-d Temp Cap*	15
Temp., °C	25
pH	7.00

revised 11/24/04 BTW

One-Hour criteria not to exceed, mg/L as Ammonia (NH3)

	0<T<TCAP			TCAP<T<30		
Parameter	6.5<pH<7.7	7.7<pH<8.0	8.0<pH<9.0	6.5<pH<7.7	7.7<pH<8.0	8.0<pH<9.0
FT	0.708	0.708	0.708	1.000	1.000	1.000
FPH	2.810	2.810	1.000	2.810	2.810	1.000
Unionized N	**0.1307**	**0.1307**	**0.3673**	**0.0925**	**0.0925**	**0.2600**
Total NH3+N	**23.1834**	**23.1834**	**65.1340**	**16.4126**	**16.4126**	**46.1113**

Four-day criteria not to exceed, mg/L as Ammonia (NH3)

	0<T<TCAP			TCAP<T<30		
Parameter	6.5<pH<7.7	7.7<pH<8.0	8.0<pH<9.0	6.5<pH<7.7	7.7<pH<8.0	8.0<pH<9.0
FT	0.708	0.708	0.708	1.413	1.413	1.413
FPH	2.810	2.810	1.000	2.810	2.810	1.000
RATIO	28.899	13.500	13.500	28.899	13.500	13.500
Unionized N	**0.0139**	**0.0298**	**0.0837**	**0.0070**	**0.0149**	**0.0420**
Total NH3+N	**2.4684**	**5.2840**	**14.8454**	**1.2371**	**2.6483**	**7.4403**

* For 1-hour criteria, Salmonids present, TCAP = 20°C; Salmonids absent, TCAP = 25°C
For 4-day criteria, Salmonids present, TCAP = 15°C; Salmonids absent, TCAP = 20°C

A Microsoft Excel spreadsheet
Use only that temperature and pH column which applies to the input data
T = Temperature, °C; TCAP = Temperature Cap, °C; see references for other definitions of terms
There may be slight differences in spreadsheet versus USEPA (1985, 1992) table values because of rounding.

REFERENCES:

Thurston, R. V., R. C. Russo, and K. Emerson. 1974. Aqueous ammonia equilibrium calculations. Tech. Rep. no. 74-1, Fisheries Bioassay Lab., Montana St. Univ., Bozeman MT 59715.
U. S. EPA. 1985. Ambient water quality criteria for ammonia - 1984. EPA 440/5-85-001
U. S. EPA. 1992. Revised tables for determining average freshwater ammonia concentrations. 7/30/92 memo.

Chemical theromdynamic parameters**

pKa	9.246378645
f	0.005638527

** pKa: -log K; K is temperature-corrected equilibrium constant for ammonium
f is the fraction of unionized NH3/(Total NH3+NH4)