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Conversation: Comment on table 6 in draft industrial stormwater general permit
Subject: Comment on table 6 in draft industrial stormwater general permit

The fact sheet described how Ecology used hardness and Washington specific dissolved to total recoverable translator values to derive water quality-based benchmark values in Table 6 for total copper, lead and zinc from the state's dissolved metals standards.

Note that the marine metal standards for copper, lead and zinc, while not hardness dependent, are also dissolved based standards. Since Table 6 requires monitoring for total copper, lead and zinc, the marine dissolved standards need to be translated to total recoverable standards using the factors in WAC 173-201A-240(3) footnote "II". The marine benchmarks become 5.8 for copper, 220.8 for lead and 95.1 for zinc, and the thresholds ten times those values.

Another concern I have is that DOE needs to be careful with how the ammonia standards are represented. The marine acute standard of 0.233 mg/L from the table in WAC 173-201A-240(3) is for unionized ammonia, and there are tables in EPA's 1989 water quality criteria for Ammonia (Saltwater) document that provide the equivalent values as total ammonia, which varies with salinity, pH and temperature. Below is a copy of the table from EPA that describes the acute marine total ammonia criteria when the salinity is 30 parts per thousand.

**TABLE VIII. TOTAL AMMONIA ACUTE CRITERIA FOR SALTWATER
AQUATIC LIFE (cont.)**

Total Ammonia in mg-N/L at 30 g/kg Salinity

pH	Temperature							
	0°C	5°C	10°C	15°C	20°C	25°C	30°C	35°C
7.0	312	208	148	102	71	48	33	23
7.2	196	135	94	64	44	31	21	15
7.4	125	85	58	40	27	19	13	9.4
7.6	79	54	37	25	21	12	8.5	6.0
7.8	50	33	23	16	11	7.9	5.4	3.7
8.0	31	21	15	10	7.3	5.0	3.5	2.5
8.2	20	14	9.6	6.7	4.6	3.3	2.3	1.7
8.4	12.7	8.7	6.0	4.2	2.9	2.1	1.6	1.1
8.6	8.1	5.6	4.0	2.7	2.0	1.4	1.1	0.81
8.8	5.2	3.5	2.5	1.8	1.3	1.0	0.75	0.58
9.0	3.3	2.3	1.7	1.2	0.94	0.71	0.56	0.46

I note also that the freshwater acute ammonia criteria is a pH dependent formula and varies for whether salmonids are present or absent. There is no discussion in the fact sheet as to how the table 6 freshwater benchmark of 2.1 mg/L for ammonia was derived. The criteria becomes lower (more stringent) as the pH increases. What pH value was used for stormwater? I suspect that stormwater will often have lower pH values than the surface waters that the stormwater flows to, since rainfall throughout the state typically has a lower pH than our surface water quality standards. The following is a table from Alaska's water quality standards manual that presents the freshwater acute ammonia criteria. Alaska's acute freshwater and saltwater ammonia criteria are identical to our state's criteria and are derived from EPA criteria. The benchmark value of 2.1 in Table 6 of the draft industrial stormwater general permit appears to be calculated based on a pH of 8.5, which is a considerably higher pH than found in rainwater, stormwater and surface fresh water in our state. I suggest that using a pH of 7.0 would be conservative.

TABLE VI. ACUTE, FRESH WATER AMMONIA CRITERIA BASED ON PH.
pH Total Ammonia Nitrogen in mg-N/L
Acute Criteria with Salmonids Present Acute Criteria with Salmonids

	Absent	
6.5	32.6	48.8
6.6	31.3	46.8
6.7	29.8	44.6
6.8	28.1	42.0
6.9	26.2	39.1
7.0	24.1	36.1
7.1	22.0	32.8
7.2	19.7	29.5
7.3	17.5	26.2
7.4	15.4	23.0
7.5	13.3	19.9
7.6	11.4	17.0
7.7	9.65	14.4
7.8	8.11	12.1
7.9	6.77	10.1
8.0	5.62	8.40
8.1	4.64	6.95
8.2	3.83	5.72
8.3	3.15	4.71
8.4	2.59	3.88
8.5	2.14	3.20
8.6	1.77	2.65
8.7	1.47	2.20
8.8	1.23	1.84

8.9 1.04 1.56
9.0 0.885 1.32

Please contact me if you have any questions.

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