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Department of Environmental Quality — 340

Agency and Division — Administrative Rules Chapter Number

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To become effective 04/18/2014 Rulemaking Notice was published in the September 2013 Oregon Bulletin.

RULE CAPTION

Corrections and Clarifications to Toxics Water Quality Standards

Not more than 15 words that reasonably identifies the subject matter of the agency's intended action.

RULEMAKING ACTION

Secure approval of new rule numbers with the Administrative Rules Unit prior to filing.

ADOPT:

AMEND:
340-041-0033

REPEAL:

RENUMBER:

AMEND AND RENUMBER:

Statutory Authority:
ORS 468.020, 468B.030, 468B.035, 468B.048

Other Authority:

Statutes Implemented:
ORS 468B.030, 468B.035, 468B.048

RULE SUMMARY

The EQC amended water quality standards rules for toxic substances to correct and clarify the standards. Revisions to water quality standards require EPA approval before the revisions become effective for Clean Water Act programs.

The rules include the following:
Ã¢â‚¬Â¢ Correct several toxic pollutant criteria that EPA recently disapproved and address other minor revisions to the Toxic Substances rule. EPA disapproved criteria for 11 pesticides based on potentially conflicting information in regards to how the frequency and duration components of these criteria are expressed. DEQ expects that clarifying this aspect of the criteria will lead to EPA approval of 36 pesticide criteria values associated with 11 pesticides.
Ã¢â‚¬Â¢ Correct an error in the expression of freshwater selenium criteria.
Ã¢â‚¬Â¢ Re-propose freshwater and saltwater arsenic criteria and chromium VI saltwater criteria that were inadvertently left off the criteria table during a 2007 rulemaking.
Ã¢â‚¬Â¢ Correct typographical errors made during the 2011 Human Health Toxics Rulemaking.
Ã¢â‚¬Â¢ Move all effective aquatic life criteria from Tables 20, 33A, and 33B into a new aquatic life criteria table, Table 30, and to refer to the new table in the Toxic Substances rule language. As a result, Tables 20, 33A, and 33B are no longer needed and would be repealed under this proposal.
Ã¢â‚¬Â¢ Delete aluminum from Table 30 to reflect EPA's disapproval of the freshwater criteria for aluminum because the disapproval renders the criteria ineffective and there are no other criteria for aluminum. DEQ anticipates adopting revised freshwater criteria for aluminum in a future rulemaking process.

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DIVISION 41

WATER QUALITY STANDARDS: BENEFICIAL USES, POLICIES, AND CRITERIA FOR OREGON

340-041-0033
Toxic Substances

(1) Amendments to sections (1-5) and (7) of this rule (OAR 340-041-0033) and associated revisions to Tables 20, 33A, 33B, 33C, and 40 become effective on April 18, 2014. The amendments do not become applicable for purposes of ORS chapter 468B or the federal Clean Water Act, however, unless approved by EPA pursuant to 40 CFR 131.21 (4/27/2000).

(2) Toxic Substances Narrative. Toxic substances may not be introduced above natural background levels in waters of the state in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare or aquatic life, wildlife, or other designated beneficial uses.

(3) Aquatic Life Numeric Criteria. Levels of toxic substances in waters of the state may not exceed the applicable aquatic life criteria listed in Table 30.

(4) Human Health Numeric Criteria. The criteria for waters of the state listed in Table 40 are established to protect Oregonians from potential adverse health effects associated with long-term exposure to toxic substances associated with consumption of fish, shellfish, and water.

(5) To establish permit or other regulatory limits for toxic substances for which criteria are not included in Table 30 or Table 40, the department may use the guidance values in Table 31, public health advisories, and other published scientific literature. The department may also require or conduct bio-assessment studies to monitor the toxicity to aquatic life of complex effluents, other suspected discharges, or chemical substances without numeric criteria.

(6) Establishing Site-Specific Background Pollutant Criteria: This provision is a performance based water quality standard that results in site-specific human health water quality criteria under the conditions and procedures specified in this rule section. It addresses existing permitted discharges of a pollutant removed from the same body of water. For waterbodies where a discharge does not increase the pollutant's mass and does not increase the pollutant concentration by more than 3%, and where the water body meets a pollutant concentration associated with a risk level of 1×10^{-4}, DEQ concludes that the pollutant concentration continues to protect human health.

(a) Definitions: For the purpose of this section (OAR 340-041-0033(6)):

(A) "Background pollutant concentration" means the ambient water body concentration immediately upstream of the discharge, regardless of whether those pollutants are natural or result from upstream human activity.

(B) An "intake pollutant" is the amount of a pollutant that is present in public waters (including groundwater) as provided in subsection (C), below, at the time it is withdrawn from such waters by the discharger or other facility supplying the discharger with intake water.

(C) "Same body of water": An intake pollutant is considered to be from the "same body of water" as the discharge if the department finds that the intake pollutant would have reached the vicinity of the outfall point in the receiving water within a reasonable period had it not been removed by the permittee. This finding may be deemed established if:

(i) The background concentration of the pollutant in the receiving water (excluding any amount of the pollutant in the facility's discharge) is similar to that in the intake water;

(ii) There is a direct hydrological connection between the intake and discharge points; and

(I) The department may also consider other site-specific factors relevant to the transport and fate of the pollutant to make the finding in a particular case that a pollutant would or would not have reached the vicinity of the outfall point in the receiving water within a reasonable period had it not been removed by the permittee.
(II) An intake pollutant from groundwater may be considered to be from the "same body of water" if the department determines that the pollutant would have reached the vicinity of the outfall point in the receiving water within a reasonable period had it not been removed by the permittee, except that such a pollutant is not from the same body of water if the groundwater contains the pollutant partially or entirely due to past or present human activity, such as industrial, commercial, or municipal operations, disposal actions, or treatment processes.
(iii) Water quality characteristics (e.g., temperature, pH, hardness) are similar in the intake and receiving waters.
(b) Applicability
(A) Site-specific criteria may be established under this rule section only for carcinogenic pollutants.
(B) Site-specific criteria established under this rule section apply in the vicinity of the discharge for purposes of establishing permit limits for the specified permittee.
(C) The underlying waterbody criteria continue to apply for all other Clean Water Act programs.
(D) The site-specific background pollutant criterion will be effective upon department issuance of the permit for the specified permittee.
(E) Any site-specific criteria developed under this procedure will be re-evaluated upon permit renewal.
(c) A site-specific background pollutant criterion may be established where all of the following conditions are met:
(A) The discharger has a currently effective NPDES permit;
(B) The mass of the pollutant discharged to the receiving waterbody does not exceed the mass of the intake pollutant from the same body of water, as defined in section (6)(a)(C) above, and, therefore, does not increase the total mass load of the pollutant in the receiving water body;
(C) The discharger has not been assigned a TMDL wasteload allocation for the pollutant in question;
(D) The permittee uses any feasible pollutant reduction measures available and known to minimize the pollutant concentration in their discharge;
(E) The pollutant discharge has not been chemically or physically altered in a manner that causes adverse water quality impacts that would not occur if the intake pollutants were left in-stream; and,
(F) The timing and location of the pollutant discharge would not cause adverse water quality impacts that would not occur if the intake pollutant were left in-stream.
(d) The site-specific background pollutant criterion must be the most conservative of the following four values. The procedures deriving these values are described in the sections (6)(e) of this rule.
(A) The projected in-stream pollutant concentration resulting from the current discharge concentration and any feasible pollutant reduction measures under (c)(D) above, after mixing with the receiving stream.
(B) The projected in-stream pollutant concentration resulting from the portion of the current discharge concentration associated with the intake pollutant mass after mixing with the receiving stream. This analysis ensures that there will be no increase in the mass of the intake pollutant in the receiving water body as required by condition (c)(B) above.
(C) The projected in-stream pollutant concentration associated with a 3% increase above the background pollutant concentration as calculated:
(i) For the mainstem Willamette and Columbia Rivers, using 25% of the harmonic mean flow of the waterbody.
(ii) For all other waters, using 100% of the harmonic mean flow or similar critical flow value of the waterbody.
(D) A criterion concentration value representing a human health risk level of 1×10^{-4}. This value is calculated using EPA's human health criteria derivation equation for carcinogens (EPA 2000), a risk level of 1×10^{-4}, and the same values for the remaining calculation variables that were used to derive the underlying human health criterion.

(e) Procedure to derive a site-specific human health water quality criterion to address a background pollutant:
(A) The department will develop a flow-weighted characterization of the relevant flows and pollutant concentrations of the receiving waterbody, effluent and all facility intake pollutant sources to determine the fate and transport of the pollutant mass.
(i) The pollutant mass in the effluent discharged to a receiving waterbody may not exceed the mass of the intake pollutant from the same body of water.
(ii) Where a facility discharges intake pollutants from multiple sources that originate from the receiving waterbody and from other waterbodies, the department will calculate the flow-weighted amount of each source of the pollutant in the characterization.
(iii) Where intake water for a facility is provided by a municipal water supply system and the supplier provides treatment of the raw water that removes an intake water pollutant, the concentration and mass of the intake water pollutant shall be determined at the point where the water enters the water supplier's distribution system.
(B) Using the flow weighted characterization developed in Section (6)(e)(A), the department will calculate the in-stream pollutant concentration following mixing of the discharge into the receiving water. The resultant concentration will be used to determine the conditions in Section (6)(d)(A) and (B).
(C) Using the flow weighted characterization, the department will calculate the in-stream pollutant concentration based on an increase of 3% above background pollutant concentration. The resultant concentration will be used to determine the condition in Section (6)(d)(C).
(i) For the mainstem Willamette and Columbia Rivers, 25% of the harmonic mean flow of the waterbody will be used.
(ii) For all other waters, 100% of the harmonic mean flow or similar critical flow value of the waterbody will be used.
(D) The department will select the most conservative of the following values as the site-specific water quality criterion.
(i) The projected in-stream pollutant concentration described in Section 6(e)(B);
(ii) The in-stream pollutant concentration based on an increase of 3% above background described in Section (6)(e)(C); or
(iii) A water quality criterion based on a risk level of 1×10^{-4}.
(f) Calculation of water quality based effluent limits based on a site-specific background pollutant criterion:
(A) For discharges to receiving waters with a site-specific background pollutant criterion, the department will use the site-specific criterion in the calculation of a numeric water quality based effluent limit.
(B) The department will compare the calculated water quality based effluent limits to any applicable aquatic toxicity or technology based effluent limits and select the most conservative for inclusion in the permit conditions.
(g) In addition to the water quality based effluent limits described in Section (6)(f), the department will calculate a mass-based limit where necessary to ensure that the condition described in Section (6)(c)(B) is met. Where mass-based limits are included, the permit shall specify how compliance with mass-based effluent limitations will be assessed.
(h) The permit shall include a provision requiring the department to consider the re-opening of the permit and re-evaluation of the site-specific background pollutant criterion if new information shows the discharger no longer meets the conditions described in subsections (6)(c) and (e).
(i) Public Notification Requirements.
(A) If the department proposes to grant a site-specific background pollutant criterion, it must provide public notice of the proposal and hold a public hearing. The public notice may be included in the public notification of a draft NPDES permit or other draft regulatory decision that would rely on the criterion and will also be published on the water quality standards website;
(B) The department will publish a list of all site-specific background pollutant criteria approved pursuant to this rule. A criterion will be added to this list within 30 days of its effective date. The list will identify:

the permittee; the site-specific background pollutant criterion and the associated risk level; the waterbody to which the criterion applies; the allowable pollutant effluent limit; and how to obtain additional information about the criterion.

(7) Arsenic Reduction Policy: The inorganic arsenic criterion for the protection of human health from the combined consumption of organisms and drinking water is 2.1 micrograms per liter. While this criterion is protective of human health and more stringent than the federal maximum contaminant level (MCL) for arsenic in drinking water, which is 10 micrograms per liter, it nonetheless is based on a higher risk level than the Commission has used to establish other human health criteria. This higher risk level recognizes that much of the risk is due to naturally high levels of inorganic arsenic in Oregon's waterbodies. In order to maintain the lowest human health risk from inorganic arsenic in drinking water, the Commission has determined that it is appropriate to adopt the following policy to limit the human contribution to that risk.

(a) The arsenic reduction policy established by this rule section does not become applicable for purposes of ORS chapter 468B or the federal Clean Water Act unless and until the numeric arsenic criteria established by this rule are approved by EPA pursuant to 40 CFR 131.21 (4/27/2000).

(b) It is the policy of the Commission that the addition of inorganic arsenic from new or existing anthropogenic sources to waters of the state within a surface water drinking water protection area be reduced the maximum amount feasible. The requirements of this rule section (OAR 340-041-0033(7)) apply to sources that discharge to surface waters of the state with an ambient inorganic arsenic concentration equal to or lower than the applicable numeric inorganic arsenic criteria for the protection of human health.

(c) The following definitions apply to this section (OAR 340-041-0033(7)):

(A) "Add inorganic arsenic" means to discharge a net mass of inorganic arsenic from a point source (the mass of inorganic arsenic discharged minus the mass of inorganic arsenic taken into the facility from a surface water source).

(B) A "surface water drinking water protection area," for the purpose of this section, means an area delineated as such by DEQ under the source water assessment program of the federal Safe Drinking Water Act, 42 U.S.C. ¦ 300j 13. The areas are delineated for the purpose of protecting public or community drinking water supplies that use surface water sources. These delineations can be found at DEQ's drinking water program website.

(C) "Potential to significantly increase inorganic arsenic concentrations in the public drinking water supply source water" means:

(i) to increase the concentration of inorganic arsenic in the receiving water for a discharge by 10 percent or more after mixing with the harmonic mean flow of the receiving water; or

(ii) as an alternative, if sufficient data are available, the discharge will increase the concentration of inorganic arsenic in the surface water intake water of a public water system by 0.021 micrograms per liter or more based on a mass balance calculation.

(d) Following the effective date of this rule, applications for an individual NPDES permit or permit renewal received from industrial dischargers located in a surface water drinking water protection area and identified by DEQ as likely to add inorganic arsenic to the receiving water must include sufficient data to enable DEQ to determine whether:

(A) The discharge in fact adds inorganic arsenic; and

(B) The discharge has the potential to significantly increase inorganic arsenic concentrations in the public drinking water supply source water.

(e) Where DEQ determines that both conditions in subsection (d) of this section (7) are true, the industrial discharger must develop an inorganic arsenic reduction plan and propose all feasible measures to reduce its inorganic arsenic loading to the receiving water. The proposed plan, including proposed measures, monitoring and reporting requirements, and a schedule for those actions, will be described in the fact sheet and incorporated into the source's NPDES permit after public comment and DEQ review and approval. In developing the plan, the source must:

(A) Identify how much it can minimize its inorganic arsenic discharge through pollution prevention measures, process changes, wastewater treatment, alternative water supply (for groundwater users) or other possible pollution prevention and/or control measures;
(B) Evaluate the costs, feasibility and environmental impacts of the potential inorganic arsenic reduction and control measures;
(C) Estimate the predicted reduction in inorganic arsenic and the reduced human health risk expected to result from the control measures;
(D) Propose specific inorganic arsenic reduction or control measures, if feasible, and an implementation schedule; and
(E) Propose monitoring and reporting requirements to document progress in plan implementation and the inorganic arsenic load reductions.
(f) In order to implement this section, DEQ will develop the following information and guidance within 120 days of the effective date of this rule and periodically update it as warranted by new information:
(A) A list of industrial sources or source categories, including industrial stormwater and sources covered by general permits, that are likely to add inorganic arsenic to surface waters of the State.
(i) For industrial sources or source categories permitted under a general permit that have been identified by DEQ as likely sources of inorganic arsenic, DEQ will evaluate options for reducing inorganic arsenic during permit renewal or evaluation of Stormwater Pollution Control Plans.
(B) Quantitation limits for monitoring inorganic arsenic concentrations.
(C) Information and guidance to assist sources in estimating, pursuant to subsection (e)(C) of this section, the reduced human health risk expected to result from inorganic arsenic control measures based on the most current EPA risk assessment.
(g) It is the policy of the Commission that landowners engaged in agricultural or development practices on land where pesticides, fertilizers, or soil amendments containing arsenic are currently being or have previously been applied, implement conservation practices to minimize the erosion and runoff of inorganic arsenic to waters of the State or to a location where such material could readily migrate into waters of the State.
[ED. NOTE: Tables referencing the toxics criteria are not included in rule text. Click here for a PDF copy of Table 30: Aquatic Life Water Quality Criteria for Toxic Pollutants. Click here for a PDF copy of Table 31: Aquatic Life Water Quality Guidance Values for Toxic Pollutants. Click here for a PDF copy of Table 40: Human Health Water Quality Criteria for Toxic Pollutants.]
Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048
Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048
Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 3-2004, f. & cert. ef. 5-28-04; DEQ 17-2010, f. & cert. ef. 12-21-10; DEQ 8-2011, f. & cert. ef. 6-30-11; DEQ 10-2011, f. & cert. ef. 7-13-11

DIVISION 41

WATER QUALITY STANDARDS: BENEFICIAL USES, POLICIES, AND CRITERIA FOR OREGON

340-041-0033

Toxic Substances

TABLE 30: Aquatic Life Water Quality Criteria for Toxic Pollutants

Effective April 18, 2014

Aquatic Life Criteria Summary

The concentration for each compound listed in Table 30 is a criterion not to be exceeded in waters of the state in order to protect aquatic life. The aquatic life criteria apply to waterbodies where the protection of fish and aquatic life are the designated uses. All values are expressed as micrograms per liter (µg/L). Compounds are listed in alphabetical order with the corresponding information: the Chemical Abstract Service (CAS) number, whether there is a human health criterion for the pollutant (i.e. "y"= yes, "n" = no), and the associated aquatic life freshwater and saltwater acute and chronic criteria. Italicized pollutants are not identified as priority pollutants by EPA. Dashes in the table column indicate that there is no aquatic life criterion.

Unless otherwise noted in the table below, the acute criterion is the Criterion Maximum Concentration (CMC) applied as a one-hour average concentration, and the chronic criterion is the Criterion Continuous Concentration (CCC) applied as a 96-hour (4 days) average concentration. The CMC and CCC criteria should not be exceeded more than once every three years. Footnote A, associated with eleven pesticide pollutants in Table 30, describes the exception to the frequency and duration of the toxics criteria stated in this paragraph.

Table 30

Aquatic Life Water Quality Criteria for Toxic Pollutants

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
1	Aldrin	309002	y	3 [A]	--	1.3 [A]	--
[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*							
2	*Alkalinity*		n	--	20,000 [B]	--	--
[B] *Criterion shown is the minimum (i.e. CCC in water may not be below this value in order to protect aquatic life).*							

Table 30

Aquatic Life Water Quality Criteria for Toxic Pollutants

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
3	*Ammonia*	7664417	n	*Criteria are pH, temperature, and salmonid or sensitive coldwater species dependent--See document USEPA January 1985 (Fresh Water).* **M**		*Ammonia criteria for saltwater may depend on pH and temperature. Values for saltwater criteria (total ammonia) can be calculated from the tables specified in Ambient Water Quality Criteria for Ammonia (Saltwater)--1989 (EPA 440/5-88-004; http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm)*	
M *See expanded endnote M equations at bottom of Table 30 to calculate freshwater ammonia criteria*							
4	Arsenic	7440382	y	340 **C, D**	150 **C, D**	69 **C, D**	36 **C, D**
C *Criterion is expressed in terms of "dissolved" concentrations in the water column.* **D** *Criterion is applied as total inorganic arsenic (i.e. arsenic (III) + arsenic (V)).*							
5	BHC Gamma (Lindane)	58899	y	0.95	0.08 **A**	0.16 **A**	--
A *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*							
6	Cadmium	7440439	n	*See* **E**	*See* **C, F**	40 **C**	8.8 **C**
C *Criterion is expressed in terms of "dissolved" concentrations in the water column.* **E** *The freshwater criterion for this metal is expressed as "total recoverable" and is a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote E at bottom of Table 30.* **F** *The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*							
7	Chlordane	57749	y	2.4 **A**	0.0043 **A**	0.09 **A**	0.004 **A**
A *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*							
8	*Chloride*	16887006	n	860,000	230,000	--	--
9	*Chlorine*	7782505	n	19	11	13	7.5

Table 30

Aquatic Life Water Quality Criteria for Toxic Pollutants

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
10	*Chlorpyrifos*	2921882	n	0.083	0.041	0.011	0.0056
11	Chromium III	16065831	n	*See* **C, F**	*See* **C, F**	--	--
	C *Criterion is expressed in terms of "dissolved" concentrations in the water column.* **F** *The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*						
12	Chromium VI	18540299	n	16 **C**	11 **C**	1100 **C**	50 **C**
	C *Criterion is expressed in terms of "dissolved" concentrations in the water column.*						
13	Copper	7440508	y	*See* **E**	*See* **E**	4.8 **C**	3.1 **C**
	C *Criterion is expressed in terms of "dissolved" concentrations in the water column.* **E** *The freshwater criterion for this metal is expressed as "total recoverable" and is a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote E at bottom of Table 30.*						
14	Cyanide	57125	y	22 **J**	5.2 **J**	1 **J**	1 **J**
	J *This criterion is expressed as µg free cyanide (CN)/L.*						
15	DDT 4,4'	50293	y	1.1 **A, G**	0.001 **A, G**	0.13 **A, G**	0.001 **A, G**
	A *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.* **G** *This criterion applies to DDT and its metabolites (i.e. the total concentration of DDT and its metabolites should not exceed this value).*						
16	*Demeton*	8065483	n	--	0.1	--	0.1
17	Dieldrin	60571	y	0.24	0.056	0.71 **A**	0.0019 **A**
	A *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
18	Endosulfan	115297	n	0.22 **A, H**	0.056 **A, H**	0.034 **A, H**	0.0087 **A, H**
	A *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.* **H** *This value is based on the criterion published in Ambient Water Quality Criteria for Endosulfan (EPA 440/5-80-046) and should be applied as the sum of alpha- and beta-endosulfan.*						
19	Endosulfan Alpha	959988	y	0.22 **A**	0.056 **A**	0.034 **A**	0.0087 **A**

Table 30

Aquatic Life Water Quality Criteria for Toxic Pollutants

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
20	Endosulfan Beta	33213659	y	0.22 [A]	0.056 [A]	0.034 [A]	0.0087 [A]
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
21	Endrin	72208	y	0.086	0.036	0.037 [A]	0.0023 [A]
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
22	*Guthion*	86500	n	--	0.01	--	0.01
23	Heptachlor	76448	y	0.52 [A]	0.0038 [A]	0.053 [A]	0.0036 [A]
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
24	Heptachlor Epoxide	1024573	y	0.52 [A]	0.0038 [A]	0.053 [A]	0.0036 [A]
	[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*						
25	*Iron (total)*	7439896	n	--	1000	--	--
26	Lead	7439921	n	*See* **C , F**	*See* **C , F**	210 [C]	8.1 [C]
	[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [F] *The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*						
27	*Malathion*	121755	n	--	0.1	--	0.1
28	Mercury (total)	7439976	n	2.4	0.012	2.1	0.025
29	*Methoxychlor*	72435	y	--	0.03	--	0.03
30	*Mirex*	2385855	n	--	0.001	--	0.001
31	Nickel	7440020	y	*See* **C , F**	*See* **C , F**	74 [C]	8.2 [C]
	[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [F] *The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*						
32	*Parathion*	56382	n	0.065	0.013	--	--
33	Pentachlorophenol	87865	y	*See* **H**	*See* **H**	13	7.9

Table 30

Aquatic Life Water Quality Criteria for Toxic Pollutants

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
[H] *Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: CMC=(exp(1.005(pH)-4.869); CCC=exp(1.005(pH)-5.134).*							
34	*Phosphorus Elemental*	7723140	n	--	--	--	0.1
35	Polychlorinated Biphenyls (PCBs)	NA	y	2 [K]	0.014 [K]	10 [K]	0.03 [K]
[K] *This criterion applies to total PCBs (e.g.* determined as Aroclors or congeners)							
36	Selenium	7782492	y	*See* **C** , **L**	4.6 [C]	290 [C]	71 [C]
[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [L] *The CMC=(1/[(f1/CMC1)+(f2/CMC2)]µg/L) * CF where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively,and CMC1 and CMC2 are 185.9 µg/L and 12.82 µg/L, respectively. See expanded endnote F for the Conversion Factor (CF) for selenium.*							
37	Silver	7440224	n	*See* **C** , **F**	0.10 [C]	1.9 [C]	--
[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [F] *The freshwater acute criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*							
38	*Sulfide Hydrogen Sulfide*	7783064	n	--	2	--	2
39	Toxaphene	8001352	y	0.73	0.0002	0.21	0.0002
40	*Tributyltin (TBT)*	688733	n	0.46	0.063	0.37	0.01
41	Zinc	7440666	y	*See* **C , F**	*See* **C , F**	90 [C]	81 [C]
[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.* [F] *The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*							

Expanded Endnotes A, E, F, M

Endnote A: Alternate Frequency and Duration for Certain Pesticides

This criterion is based on EPA recommendations issued in 1980 that were derived using guidelines that differed from EPA's 1985 Guidelines which update minimum data requirements and derivation procedures. The CMC may not be exceeded at any time and the CCC may not be exceeded based on a 24-hour average. The CMC may be applied using a one hour averaging period not to be exceeded more than once every three years, if the CMC values given in Table 30 are divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.

Endnote E: Equations for Hardness-Dependent Freshwater Metals Criteria for Cadmium Acute and Copper Acute and Chronic Criteria

The freshwater criterion for this metal is expressed as total recoverable with two significant figures, and is a function of hardness (mg/L) in the water column. Criteria values for hardness are calculated using the following formulas (CMC refers to the acute criterion; CCC refers to the chronic criterion):

$$\textbf{CMC} = (\exp(m_A*[\ln(\text{hardness})] + b_A))$$

$$\textbf{CCC} = (\exp(m_C*[\ln(\text{hardness})] + b_C))$$

Chemical	m_A	b_A	m_C	b_C
Cadmium	1.128	-3.828	N/A	N/A
Copper	0.9422	-1.464	0.8545	-1.465

Endnote F: Equations for Hardness-Dependent Freshwater Metals Criteria and Conversion Factor Table

The freshwater criterion for this metal is expressed as dissolved with two significant figures, and is a function of hardness (mg/L) in the water column. Criteria values for hardness are calculated using the following formulas (CMC refers to the acute criterion; CCC refers to the chronic criterion):

$$\textbf{CMC} = (\exp(m_A*[\ln(\text{hardness})] + b_A))*CF$$

$$\textbf{CCC} = (\exp(m_C*[\ln(\text{hardness})] + b_C))*CF$$

"CF" is the conversion factor used for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column.

Chemical	m_A	b_A	m_C	b_C
Cadmium	N/A	N/A	0.7409	-4.719
Chromium III	0.8190	3.7256	0.8190	0.6848
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	2.255	0.8460	0.0584
Silver	1.72	-6.59	--	--
Zinc	0.8473	0.884	0.8473	0.884

The conversion factors (CF) below must be used in the equations above for the hardness-dependent metals in order to convert total recoverable metals criteria to dissolved metals criteria. For metals that are not hardness-dependent (i.e. arsenic, chromium VI, selenium, and silver (chronic)), or are saltwater criteria, the criterion value associated with the metal in Table 30 already reflects a dissolved criterion based on its conversion factor below.

Conversion Factor (CF) Table for Dissolved Metals

Chemical	Freshwater		Saltwater	
	Acute	Chronic	Acute	Chronic
Arsenic	1.000	1.000	1.000	1.000
Cadmium	N/A	1.101672-[(ln hardness)(0.041838)]	0.994	0.994
Chromium III	0.316	0.860	--	--
Chromium VI	0.982	0.962	0.993	0.993
Copper	N/A	N/A	0.83	0.83
Lead	1.46203-[(ln hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]	0.951	0.951
Nickel	0.998	0.997	0.990	0.990
Selenium	0.996	0.922	0.998	0.998
Silver	0.85	0.85	0.85	--
Zinc	0.978	0.986	0.946	0.946

Endnote M: Equations for Freshwater Ammonia Calculations

Acute Criterion

The 1-hour average concentration of un-ionized ammonia (mg/L NH_3) may not exceed more often than once every three years on average, the numerical value given by:

CMC_{NH3} = 0.52/FT/FPH/2 where:

FT = temperature adjustment factor
FPH = pH adjustment factor
TCAP = temperature cap

$FT = 10^{0.03(20-TCAP)}$; $TCAP \le T \le 30^{\circ} C$
$FT = 10^{0.03(20-T)}$; $0 \le T \le TCAP$

$FPH = 1$ $8 \le pH \le 9$
$FPH = \frac{1 + 10^{7.4-pH}}{1.25}$ $6.5 \le pH \le 8$

TCAP = 20 ˚C; Salmonids and other sensitive coldwater species present

TCAP = 25 ˚C; Salmonids and other sensitive coldwater species absent

Chronic Criterion
The 4-day average concentration of un-ionized ammonia (mg/L NH_3) may not exceed more often than once every three years on average, the average numerical value given by:

CCC_{NH3} = 0.80/FT/FPH/RATIO

where FT and FPH are as above for acute criterion and:

RATIO = 16 *where* $7.7 \leq pH \leq 9$

RATIO = $24 \times \left[\frac{10^{7.7 - pH}}{1 + 10^{7.4 - pH}} \right]$ *where* $6.5 \leq pH \leq 7.7$

TCAP = 15 ˚C; Salmonids and other sensitive coldwater species present
TCAP = 20 ˚C; Salmonids and other sensitive coldwater species absent

TABLE 31: Aquatic Life Water Quality Guidance Values for Toxic Pollutants

Effective April 18, 2014

Water Quality Guidance Values Summary [A]

The concentration for each compound listed in Table 31 is a guidance value that can be used in application of Oregon's Toxic Substances Narrative (340-041-0033(2)) to waters of the state in order to protect aquatic life. All values are expressed as micrograms per liter (µg/L) except where noted. Compounds are listed in alphabetical order with the corresponding EPA number (from National Recommended Water Quality Criteria: 2002, EPA-822-R-02-047), corresponding Chemical Abstract Service (CAS) number, aquatic life freshwater acute and chronic guidance values, and aquatic life saltwater acute and chronic guidance values.

Table 31

Aquatic Life Water Quality Guidance Values for Toxic Pollutants

EPA No.	Pollutant	CAS Number	Freshwater		Saltwater	
			Acute	Chronic	Acute	Chronic
56	Acenaphthene	83329	1,700	520	970	710
17	Acrolein	107028	68	21	55	
18	Acrylonitrile	107131	7,550	2,600		
1	Antimony	7440360	9,000	1,600		
19	Benzene	71432	5,300		5,100	700
59	Benzidine	92875	2,500			
3	Beryllium	7440417	130	5.3		
19 B	BHC (Hexachlorocyclohexane-Technical)	319868	100		0.34	
21	Carbon Tetrachloride	56235	35,200		50,000	
	Chlorinated Benzenes		250	50	160	129

Table 31

Aquatic Life Water Quality Guidance Values for Toxic Pollutants

EPA No.	Pollutant	CAS Number	Freshwater		Saltwater	
			Acute	Chronic	Acute	Chronic
	Chlorinated naphthalenes		1,600		7.5	
	Chloroalkyl Ethers		238,000			
26	Chloroform	67663	28,900	1,240		
45	Chlorophenol 2-	95578	4,380	2,000		
	Chlorophenol 4-	106489			29,700	
52	Methyl-4-chlorophenol 3-	59507	30			
5a	Chromium (III)	16065831			10,300	
109	DDE 4,4'-	72559	1,050		14	
110	DDD 4,4'-	72548	0.06		3.6	
	Diazinon	333415	0.08	0.05		
	Dichlorobenzenes		1,120	763	1,970	
29	Dichloroethane 1,2-	107062	118,000	20,000	113,000	
	Dichloroethylenes		11,600		224,000	
46	Dichlorophenol 2,4-	120832	2,020	365		
31	Dichloropropane 1,2-	78875	23,000	5,700	10,300	3,040
32	Dichloropropene 1,3-	542756	6,060	244	790	
47	Dimethylphenol 2,4-	105679	2,120			
	Dinitrotoluene		330	230	590	370
16	Dioxin (2,3,7,8-TCDD)	1746016	0.01	38 pg/L		
85	Diphenylhydrazine 1,2-	122667	270			
33	Ethylbenzene	100414	32,000		430	
86	Fluoranthene	206440	3,980		40	16
	Haloethers		360	122		
	Halomethanes		11,000		12,000	6,400
89	Hexachlorobutadiene	87683	90	9.3	32	
90	Hexachlorocyclopentadiene	77474	7	5.2	7	
91	Hexachloroethane	67721	980	540	940	
93	Isophorone	78591	117,000		12,900	

Table 31

Aquatic Life Water Quality Guidance Values for Toxic Pollutants

EPA No.	Pollutant	CAS Number	Freshwater		Saltwater	
			Acute	Chronic	Acute	Chronic
94	Naphthalene	91203	2,300	620	2,350	
95	Nitrobenzene	98953	27,000		6,680	
	Nitrophenols		230	150	4,850	
26 B	Nitrosamines	35576911	5,850		3,300,000	
	Pentachlorinated ethanes		7,240	1,100	390	281
54	Phenol	108952	10,200	2,560	5,800	
	Phthalate esters		940	3	2,944	3.4
	Polynuclear Aromatic Hydrocarbons				300	
	Tetrachlorinated Ethanes		9,320			
37	Tetrachloroethane 1,1,2,2-	79345		2,400	9,020	
	Tetrachloroethanes		9,320			
38	Tetrachloroethylene	127184	5,280	840	10,200	450
	Tetrachlorophenol 2,3,5,6					440
12	Thallium	7440280	1,400	40	2,130	
39	Toluene	108883	17,500		6,300	5,000
	Trichlorinated ethanes		18,000			
41	Trichloroethane 1,1,1-	71556			31,200	
42	Trichloroethane 1,1,2-	79005		9,400		
43	Trichloroethylene	79016	45,000	21,900	2,000	
55	Trichlorophenol 2,4,6-	88062		970		

The following chemicals/compounds/classes are of concern due to the potential for toxic effects to aquatic organisms; however, no guidance values are designated. If these compounds are identified in the waste stream, then a review of the scientific literature may be appropriate for deriving guidance values.

- Polybrominated diphenyl ethers (PBDE)
- Polybrominated biphenyls (PBB)
- Pharmaceuticals

- ❑ Personal care products
- ❑ Alkyl Phenols
- ❑ Other chemicals with Toxic effects

Footnotes:

A Values in Table 31 are applicable to all basins.

B This number was assigned to the list of non-priority pollutants in National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047).

TABLE 40: Human Health Water Quality Criteria for Toxic Pollutants

Effective April 18, 2014

Human Health Criteria Summary

The concentration for each pollutant listed in Table 40 was derived to protect Oregonians from potential adverse health impacts associated with long-term exposure to toxic substances associated with consumption of fish, shellfish, and water. The "organism only" criteria are established to protect fish and shellfish consumption and apply to waters of the state designated for fishing. The "water + organism" criteria are established to protect the consumption of drinking water, fish, and shellfish, and apply where both fishing and domestic water supply (public and private) are designated uses. All criteria are expressed as micrograms per liter (µg/L), unless otherwise noted. Pollutants are listed in alphabetical order. Additional information includes the Chemical Abstract Service (CAS) number, whether the criterion is based on carcinogenic effects (can cause cancer in humans), and whether there is an aquatic life criterion for the pollutant (i.e. "y"= yes, "n" = no). All the human health criteria were calculated using a fish consumption rate of 175 grams per day unless otherwise noted. A fish consumption rate of 175 grams per day is approximately equal to 23 8-ounce fish meals per month. For pollutants categorized as carcinogens, values represent a cancer risk of one additional case of cancer in one million people (i.e. 10^{-6}), unless otherwise noted. All metals criteria are for total metal concentration, unless otherwise noted. Italicized pollutants represent non-priority pollutants. The human health criteria revisions established by OAR 340-041-0033 and shown in Table 40 do not become applicable for purposes of ORS chapter 468B or the federal Clean Water Act until approved by EPA pursuant to 40 CFR 131.21 (4/27/2000).

Table 40

Human Health Water Quality Criteria for Toxic Pollutants

No.	Pollutant	CAS Number	Carcinogen	Aquatic Life Criterion	*Human Health Criteria for the Consumption of:*	
					Water + Organism (µg/L)	Organism Only (µg/L)
1	Acenaphthene	83329	n	n	95	99
2	Acrolein	107028	n	n	0.88	0.93

Table 40

Human Health Water Quality Criteria for Toxic Pollutants

No.	Pollutant	CAS Number	Carcinogen	Aquatic Life Criterion	*Human Health Criteria for the Consumption of:*	
					Water + Organism (µg/L)	Organism Only (µg/L)
3	Acrylonitrile	107131	y	n	0.018	0.025
4	Aldrin	309002	y	y	0.0000050	0.0000050
5	Anthracene	120127	n	n	2900	4000
6	Antimony	7440360	n	n	5.1	64
7	Arsenic (inorganic) [A]	7440382	y	y	2.1	2.1(freshwater) 1.0 (saltwater)
	[A] *The arsenic criteria are expressed as total inorganic arsenic. The "organism only" freshwater criterion is based on a risk level of approximately 1 x 10^{-5}, and the "water + organism" criterion is based on a risk level of 1 x 10^{-4}.*					
8	Asbestos [B]	1332214	y	n	7,000,000 fibers/L	--
	[B] *The human health risks from asbestos are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
9	*Barium* [C]	7440393	n	n	1000	--
	[C] *The human health criterion for barium is the same as originally published in the 1976 EPA Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value was also published in the 1986 EPA Gold Book. Human health risks are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
10	Benzene	71432	y	n	0.44	1.4
11	Benzidine	92875	y	n	0.000018	0.000020
12	Benz(a)anthracene	56553	y	n	0.0013	0.0018
13	Benzo(a)pyrene	50328	y	n	0.0013	0.0018
14	Benzo(b)fluoranthene 3,4	205992	y	n	0.0013	0.0018
15	Benzo(k)fluoranthene	207089	y	n	0.0013	0.0018
16	BHC Alpha	319846	y	n	0.00045	0.00049
17	BHC Beta	319857	y	n	0.0016	0.0017
18	BHC Gamma (Lindane)	58899	n	y	0.17	0.18
19	Bromoform	75252	y	n	3.3	14
20	Butylbenzyl Phthalate	85687	n	n	190	190
21	Carbon Tetrachloride	56235	y	n	0.10	0.16
22	Chlordane	57749	y	y	0.000081	0.000081
23	Chlorobenzene	108907	n	n	74	160
24	Chlorodibromomethane	124481	y	n	0.31	1.3

Table 40

Human Health Water Quality Criteria for Toxic Pollutants

No.	Pollutant	CAS Number	Carcinogen	Aquatic Life Criterion	*Human Health Criteria for the Consumption of:*	
					Water + Organism (µg/L)	Organism Only (µg/L)
25	Chloroethyl Ether bis 2	111444	y	n	0.020	0.053
26	Chloroform	67663	n	n	260	1100
27	Chloroisopropyl Ether bis 2	108601	n	n	1200	6500
28	*Chloromethyl ether, bis*	542881	y	n	0.000024	0.000029
29	Chloronaphthalene 2	91587	n	n	150	160
30	Chlorophenol 2	95578	n	n	14	15
31	*Chlorophenoxy Herbicide (2,4,5,-TP)* [D]	93721	n	n	10	--
	[D] *The Chlorophenoxy Herbicide (2,4,5,-TP) criterion is the same as originally published in the 1976 EPA Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value was also published in the 1986 EPA Gold Book. Human health risks are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
32	*Chlorophenoxy Herbicide (2,4-D)* [E]	94757	n	n	100	--
	[E] *The Chlorophenoxy Herbicide (2,4-D) criterion is the same as originally published in the 1976 EPA Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value was also published in the 1986 EPA Gold Book. Human health risks are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
33	Chrysene	218019	y	n	0.0013	0.0018
34	Copper [F]	7440508	n	y	1300	--
	[F] *Human health risks from copper are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
35	Cyanide [G]	57125	n	y	130	130
	[G] *The cyanide criterion is expressed as total cyanide (CN)/L.*					
36	DDD 4,4'	72548	y	n	0.000031	0.000031
37	DDE 4,4'	72559	y	n	0.000022	0.000022
38	DDT 4,4'	50293	y	y	0.000022	0.000022
39	Dibenz(a,h)anthracene	53703	y	n	0.0013	0.0018
40	Dichlorobenzene(m) 1,3	541731	n	n	80	96
41	Dichlorobenzene(o) 1,2	95501	n	n	110	130
42	Dichlorobenzene(p) 1,4	106467	n	n	16	19
43	Dichlorobenzidine 3,3'	91941	y	n	0.0027	0.0028

Table 40

Human Health Water Quality Criteria for Toxic Pollutants

No.	Pollutant	CAS Number	Carcinogen	Aquatic Life Criterion	*Human Health Criteria for the Consumption of:*	
					Water + Organism (µg/L)	Organism Only (µg/L)
44	Dichlorobromomethane	75274	y	n	0.42	1.7
45	Dichloroethane 1,2	107062	y	n	0.35	3.7
46	Dichloroethylene 1,1	75354	n	n	230	710
47	Dichloroethylene trans 1,2	156605	n	n	120	1000
48	Dichlorophenol 2,4	120832	n	n	23	29
49	Dichloropropane 1,2	78875	y	n	0.38	1.5
50	Dichloropropene 1,3	542756	y	n	0.30	2.1
51	Dieldrin	60571	y	y	0.0000053	0.0000054
52	Diethyl Phthalate	84662	n	n	3800	4400
53	Dimethyl Phthalate	131113	n	n	84000	110000
54	Dimethylphenol 2,4	105679	n	n	76	85
55	Di-n-butyl Phthalate	84742	n	n	400	450
56	Dinitrophenol 2,4	51285	n	n	62	530
57	*Dinitrophenols*	25550587	n	n	62	530
58	Dinitrotoluene 2,4	121142	y	n	0.084	0.34
59	Dioxin (2,3,7,8-TCDD)	1746016	y	n	0.00000000051	0.00000000051
60	Diphenylhydrazine 1,2	122667	y	n	0.014	0.020
61	Endosulfan Alpha	959988	n	y	8.5	8.9
62	Endosulfan Beta	33213659	n	y	8.5	8.9
63	Endosulfan Sulfate	1031078	n	n	8.5	8.9
64	Endrin	72208	n	y	0.024	0.024
65	Endrin Aldehyde	7421934	n	n	0.030	0.030
66	Ethylbenzene	100414	n	n	160	210
67	Ethylhexyl Phthalate bis 2	117817	y	n	0.20	0.22
68	Fluoranthene	206440	n	n	14	14
69	Fluorene	86737	n	n	390	530
70	Heptachlor	76448	y	y	0.0000079	0.0000079
71	Heptachlor Epoxide	1024573	y	y	0.0000039	0.0000039
72	Hexachlorobenzene	118741	y	n	0.000029	0.000029
73	Hexachlorobutadiene	87683	y	n	0.36	1.8
74	*Hexachlorocyclo-hexane-Technical*	608731	y	n	0.0014	0.0015

Table 40

Human Health Water Quality Criteria for Toxic Pollutants

No.	Pollutant	CAS Number	Carcinogen	Aquatic Life Criterion	*Human Health Criteria for the Consumption of:*	
					Water + Organism (µg/L)	Organism Only (µg/L)
75	Hexachlorocyclopentadiene	77474	n	n	30	110
76	Hexachloroethane	67721	y	n	0.29	0.33
77	Indeno(1,2,3-cd)pyrene	193395	y	n	0.0013	0.0018
78	Isophorone	78591	y	n	27	96
79	*Manganese* [H]	7439965	n	n	--	100
	[H] *The "fish consumption only" criterion for manganese applies only to salt water and is for total manganese. This EPA recommended criterion predates the 1980 human health methodology and does not utilize the fish ingestion BCF calculation method or a fish consumption rate.*					
80	*Methoxychlor* [I]	72435	n	y	100	--
	[I] *The human health criterion for methoxychlor is the same as originally published in the 1976 EPA Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value was also published in the1986 EPA Gold Book. Human health risks are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
81	Methyl Bromide	74839	n	n	37	150
82	Methyl-4,6-dinitrophenol 2	534521	n	n	9.2	28
83	Methylene Chloride	75092	y	n	4.3	59
84	Methylmercury (mg/kg) [J]	22967926	n	n	--	0.040 mg/kg
	[J] *This value is expressed as the fish tissue concentration of methylmercury. Contaminated fish and shellfish is the primary human route of exposure to methylmercury.*					
85	Nickel	7440020	n	y	140	170
86	*Nitrates* [K]	14797558	n	n	10000	--
	[K] *The human health criterion for nitrates is the same as originally published in the 1976 EPA Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value was also published in the 1986 EPA Gold Book. Human health risks are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
87	Nitrobenzene	98953	n	n	14	69
88	*Nitrosamines*	35576911	y	n	0.00079	0.046
89	*Nitrosodibutylamine, N*	924163	y	n	0.0050	0.022
90	*Nitrosodiethylamine, N*	55185	y	n	0.00079	0.046
91	Nitrosodimethylamine, N	62759	y	n	0.00068	0.30
92	Nitrosodi-n-propylamine, N	621647	y	n	0.0046	0.051
93	Nitrosodiphenylamine, N	86306	y	n	0.55	0.60
94	*Nitrosopyrrolidine, N*	930552	y	n	0.016	3.4

Table 40

Human Health Water Quality Criteria for Toxic Pollutants

No.	Pollutant	CAS Number	Carcinogen	Aquatic Life Criterion	*Human Health Criteria for the Consumption of:*	
					Water + Organism (µg/L)	Organism Only (µg/L)
95	*Pentachlorobenzene*	608935	n	n	0.15	0.15
96	Pentachlorophenol	87865	y	y	0.15	0.30
97	Phenol	108952	n	n	9400	86000
98	Polychlorinated Biphenyls (PCBs) [L]	NA	y	y	0.0000064	0.0000064
	[L] *This criterion applies to total PCBs (e.g. determined as Aroclors or congeners).*					
99	Pyrene	129000	n	n	290	400
100	Selenium	7782492	n	y	120	420
101	*Tetrachlorobenzene, 1,2,4,5-*	95943	n	n	0.11	0.11
102	Tetrachloroethane 1,1,2,2	79345	y	n	0.12	0.40
103	Tetrachloroethylene	127184	y	n	0.24	0.33
104	Thallium	7440280	n	n	0.043	0.047
105	Toluene	108883	n	n	720	1500
106	Toxaphene	8001352	y	y	0.000028	0.000028
107	Trichlorobenzene 1,2,4	120821	n	n	6.4	7.0
108	Trichloroethane 1,1,2	79005	y	n	0.44	1.6
109	Trichloroethylene	79016	y	n	1.4	3.0
110	Trichlorophenol 2,4,6	88062	y	n	0.23	0.24
111	*Trichlorophenol, 2, 4, 5-*	95954	n	n	330	360
112	Vinyl Chloride	75014	y	n	0.023	0.24
113	Zinc	7440666	n	y	2100	2600

DIVISION 41
WATER QUALITY STANDARDS: BENEFICIAL USES, POLICIES, AND CRITERIA FOR OREGON

340-041-0033
Toxic Substances

(1) Amendments to~~in~~ sections (~~4~~1-5) and (~~6~~7) of this rule (OAR 340-041-0033) and associated revisions to Tables 20, 33A, 33B, 33C, and 40~~ do not~~ become effective on April 18, 2014. The amendments do not become applicable for purposes of ORS chapter 468B or the federal Clean Water Act, however, unless approved by ~~and until~~ EPA ~~approves the provisions it identifies as water quality standards~~ pursuant to 40 CFR 131.21 (4/27/2000).

(2) **Toxic Substances Narrative.** Toxic substances may not be introduced above natural background levels in waters of the state in amounts, concentrations, or combinations that may be harmful, may chemically change to harmful forms in the environment, or may accumulate in sediments or bioaccumulate in aquatic life or wildlife to levels that adversely affect public health, safety, or welfare or aquatic life, wildlife, or other designated beneficial uses.

(3) **Aquatic Life Numeric Criteria**. Levels of toxic substances in waters of the state may not exceed the applicable aquatic life criteria listed in Table 30. ~~Tables 20, 33A, and 33B. Tables 33A and 33B, adopted on May 20, 2004, update Table 20 as described in this section.~~

~~(a) Each value for criteria in Table 20 is effective until the corresponding value in Tables 33A or 33B becomes effective.~~

~~(A) Each value in Table 33A is effective on February 15, 2005, unless EPA has disapproved the value before that date. If a value is subsequently disapproved, any corresponding value in Table 20 becomes effective immediately. Values that are the same in Tables 20 and 33A remain in effect.~~

~~(B) Each value in Table 33B is effective upon EPA approval.~~

~~(b) The department will note the effective date for each value in Tables 20, 33A, and 33B as described in this section.~~

(4) **Human Health Numeric Criteria**. The criteria for waters of the state listed in Table 40 are established to protect Oregonians from potential adverse health effects associated with long-term exposure to toxic substances associated with consumption of fish, shellfish, and water.

(5) To establish permit or other regulatory limits for toxic substances for which criteria are not included in Table 30 or Table 40~~s 20, 33A, or 33B~~, the department may use the guidance values in Table 31~~3C~~, public health advisories, and other published scientific literature. The department may also require or conduct bio-assessment studies to monitor the toxicity to aquatic life of complex effluents, other suspected discharges, or chemical substances without numeric criteria.

(6) Establishing Site-Specific Background Pollutant Criteria: This provision is a performance based water quality standard that results in site-specific human health water quality criteria under the conditions and procedures specified in this rule section. It addresses existing permitted discharges of a pollutant removed from the same body of water. For waterbodies where a discharge does not increase the pollutant's mass and does not increase the pollutant concentration by more than 3%, and where the water body meets a pollutant concentration associated with a risk level of $1x10^{-4}$, DEQ concludes that the pollutant concentration continues to protect human health.

(a) Definitions: For the purpose of this section (OAR 340-041-0033(6)):

(A) "Background pollutant concentration" means the ambient water body concentration immediately upstream of the discharge, regardless of whether those pollutants are natural or result from upstream human activity.

(B) An "intake pollutant" is the amount of a pollutant that is present in public waters (including groundwater) as provided in subsection (C), below, at the time it is withdrawn from such waters by the discharger or other facility supplying the discharger with intake water.

(C) "Same body of water": An intake pollutant is considered to be from the "same body of water" as the discharge if the department finds that the intake pollutant would have reached the vicinity of the outfall

point in the receiving water within a reasonable period had it not been removed by the permittee. This finding may be deemed established if:
(i) The background concentration of the pollutant in the receiving water (excluding any amount of the pollutant in the facility's discharge) is similar to that in the intake water;
(ii) There is a direct hydrological connection between the intake and discharge points; and
(I) The department may also consider other site-specific factors relevant to the transport and fate of the pollutant to make the finding in a particular case that a pollutant would or would not have reached the vicinity of the outfall point in the receiving water within a reasonable period had it not been removed by the permittee.
(II) An intake pollutant from groundwater may be considered to be from the "same body of water" if the department determines that the pollutant would have reached the vicinity of the outfall point in the receiving water within a reasonable period had it not been removed by the permittee, except that such a pollutant is not from the same body of water if the groundwater contains the pollutant partially or entirely due to past or present human activity, such as industrial, commercial, or municipal operations, disposal actions, or treatment processes.
(iii) Water quality characteristics (e.g., temperature, pH, hardness) are similar in the intake and receiving waters.
(b) Applicability
(A) Site-specific criteria may be established under this rule section only for carcinogenic pollutants.
(B) Site-specific criteria established under this rule section apply in the vicinity of the discharge for purposes of establishing permit limits for the specified permittee.
(C) The underlying waterbody criteria continue to apply for all other Clean Water Act programs.
(D) The site-specific background pollutant criterion will be effective upon department issuance of the permit for the specified permittee.
(E) Any site-specific criteria developed under this procedure will be re-evaluated upon permit renewal.
(c) A site-specific background pollutant criterion may be established where all of the following conditions are met:
(A) The discharger has a currently effective NPDES permit;
(B) The mass of the pollutant discharged to the receiving waterbody does not exceed the mass of the intake pollutant from the same body of water, as defined in section (6)(a)(C) above, and, therefore, does not increase the total mass load of the pollutant in the receiving water body;
(C) The discharger has not been assigned a TMDL wasteload allocation for the pollutant in question;
(D) The permittee uses any feasible pollutant reduction measures available and known to minimize the pollutant concentration in their discharge;
(E) The pollutant discharge has not been chemically or physically altered in a manner that causes adverse water quality impacts that would not occur if the intake pollutants were left in-stream; and,
(F) The timing and location of the pollutant discharge would not cause adverse water quality impacts that would not occur if the intake pollutant were left in-stream.
(d) The site-specific background pollutant criterion must be the most conservative of the following four values. The procedures deriving these values are described in the sections (6)(e) of this rule.
(A) The projected in-stream pollutant concentration resulting from the current discharge concentration and any feasible pollutant reduction measures under (c)(D) above, after mixing with the receiving stream.
(B) The projected in-stream pollutant concentration resulting from the portion of the current discharge concentration associated with the intake pollutant mass after mixing with the receiving stream. This analysis ensures that there will be no increase in the mass of the intake pollutant in the receiving water body as required by condition (c)(B) above.
(C) The projected in-stream pollutant concentration associated with a 3% increase above the background pollutant concentration as calculated:
(i) For the mainstem Willamette and Columbia Rivers, using 25% of the harmonic mean flow of the waterbody.
(ii) For all other waters, using 100% of the harmonic mean flow or similar critical flow value of the waterbody.

(D) A criterion concentration value representing a human health risk level of 1 ? 10^{-4}. This value is calculated using EPA's human health criteria derivation equation for carcinogens (EPA 2000), a risk level of 1 ? 10^{-4}, and the same values for the remaining calculation variables that were used to derive the underlying human health criterion.
(e) Procedure to derive a site-specific human health water quality criterion to address a background pollutant:
(A) The department will develop a flow-weighted characterization of the relevant flows and pollutant concentrations of the receiving waterbody, effluent and all facility intake pollutant sources to determine the fate and transport of the pollutant mass.
(i) The pollutant mass in the effluent discharged to a receiving waterbody may not exceed the mass of the intake pollutant from the same body of water.
(ii) Where a facility discharges intake pollutants from multiple sources that originate from the receiving waterbody and from other waterbodies, the department will calculate the flow-weighted amount of each source of the pollutant in the characterization.
(iii) Where intake water for a facility is provided by a municipal water supply system and the supplier provides treatment of the raw water that removes an intake water pollutant, the concentration and mass of the intake water pollutant shall be determined at the point where the water enters the water supplier's distribution system.
(B) Using the flow weighted characterization developed in Section (6)(e)(A), the department will calculate the in-stream pollutant concentration following mixing of the discharge into the receiving water. The resultant concentration will be used to determine the conditions in Section (6)(d)(A) and (B).
(C) Using the flow weighted characterization, the department will calculate the in-stream pollutant concentration based on an increase of 3% above background pollutant concentration. The resultant concentration will be used to determine the condition in Section (6)(d)(C).
(i) For the mainstem Willamette and Columbia Rivers, 25% of the harmonic mean flow of the waterbody will be used.
(ii) For all other waters, 100% of the harmonic mean flow or similar critical flow value of the waterbody will be used.
(D) The department will select the most conservative of the following values as the site-specific water quality criterion.
(i) The projected in-stream pollutant concentration described in Section 6(e)(B);
(ii) The in-stream pollutant concentration based on an increase of 3% above background described in Section (6)(e)(C); or
(iii) A water quality criterion based on a risk level of 1 x 10^{-4}.
(f) Calculation of water quality based effluent limits based on a site-specific background pollutant criterion:
(A) For discharges to receiving waters with a site-specific background pollutant criterion, the department will use the site-specific criterion in the calculation of a numeric water quality based effluent limit.
(B) The department will compare the calculated water quality based effluent limits to any applicable aquatic toxicity or technology based effluent limits and select the most conservative for inclusion in the permit conditions.
(g) In addition to the water quality based effluent limits described in Section (6)(f), the department will calculate a mass-based limit where necessary to ensure that the condition described in Section (6)(c)(B) is met. Where mass-based limits are included, the permit shall specify how compliance with mass-based effluent limitations will be assessed.
(h) The permit shall include a provision requiring the department to consider the re-opening of the permit and re-evaluation of the site-specific background pollutant criterion if new information shows the discharger no longer meets the conditions described in subsections (6)(c) and (e).
(i) Public Notification Requirements.
(A) If the department proposes to grant a site-specific background pollutant criterion, it must provide public notice of the proposal and hold a public hearing. The public notice may be included in the public notification of a draft NPDES permit or other draft regulatory decision that would rely on the criterion and will also be published on the water quality standards website;

(B) The department will publish a list of all site-specific background pollutant criteria approved pursuant to this rule. A criterion will be added to this list within 30 days of its effective date. The list will identify: the permittee; the site-specific background pollutant criterion and the associated risk level; the waterbody to which the criterion applies; the allowable pollutant effluent limit; and how to obtain additional information about the criterion.

(7) Arsenic Reduction Policy: The inorganic arsenic criterion for the protection of human health from the combined consumption of organisms and drinking water is 2.1 micrograms per liter. While this criterion is protective of human health and more stringent than the federal maximum contaminant level (MCL) for arsenic in drinking water, which is 10 micrograms per liter, it nonetheless is based on a higher risk level than the Commission has used to establish other human health criteria. This higher risk level recognizes that much of the risk is due to naturally high levels of inorganic arsenic in Oregon's waterbodies. In order to maintain the lowest human health risk from inorganic arsenic in drinking water, the Commission has determined that it is appropriate to adopt the following policy to limit the human contribution to that risk.

(a) The arsenic reduction policy established by this rule section does not become applicable for purposes of ORS chapter 468B or the federal Clean Water Act unless and until the numeric arsenic criteria established by this rule are approved by EPA pursuant to 40 CFR 131.21 (4/27/2000).

(b) It is the policy of the Commission that the addition of inorganic arsenic from new or existing anthropogenic sources to waters of the state within a surface water drinking water protection area be reduced the maximum amount feasible. The requirements of this rule section (OAR 340-041-0033(~~4~~7)) apply to sources that discharge to surface waters of the state with an ambient inorganic arsenic concentration equal to or lower than the applicable numeric inorganic arsenic criteria for the protection of human health.

(c) The following definitions apply to this section (OAR 340-041-0033(~~4~~7)):

(A) "Add inorganic arsenic" means to discharge a net mass of inorganic arsenic from a point source (the mass of inorganic arsenic discharged minus the mass of inorganic arsenic taken into the facility from a surface water source).

(B) A "surface water drinking water protection area," for the purpose of this section, means an area delineated as such by DEQ under the source water assessment program of the federal Safe Drinking Water Act, 42 U.S.C. ¦ 300j 13. The areas are delineated for the purpose of protecting public or community drinking water supplies that use surface water sources. These delineations can be found at DEQ's drinking water program website.

(C) "Potential to significantly increase inorganic arsenic concentrations in the public drinking water supply source water" means:

(i) to increase the concentration of inorganic arsenic in the receiving water for a discharge by 10 percent or more after mixing with the harmonic mean flow of the receiving water; or

(ii) as an alternative, if sufficient data are available, the discharge will increase the concentration of inorganic arsenic in the surface water intake water of a public water system by 0.021 micrograms per liter or more based on a mass balance calculation.

(d) Following the effective date of this rule, applications for an individual NPDES permit or permit renewal received from industrial dischargers located in a surface water drinking water protection area and identified by DEQ as likely to add inorganic arsenic to the receiving water must include sufficient data to enable DEQ to determine whether:

(A) The discharge in fact adds inorganic arsenic; and

(B) The discharge has the potential to significantly increase inorganic arsenic concentrations in the public drinking water supply source water.

(e) Where DEQ determines that both conditions in subsection (d) of this section (~~4~~7) are true, the industrial discharger must develop an inorganic arsenic reduction plan and propose all feasible measures to reduce its inorganic arsenic loading to the receiving water. The proposed plan, including proposed measures, monitoring and reporting requirements, and a schedule for those actions, will be described in the fact sheet and incorporated into the source's NPDES permit after public comment and DEQ review and approval. In developing the plan, the source must:

(A) Identify how much it can minimize its inorganic arsenic discharge through pollution prevention measures, process changes, wastewater treatment, alternative water supply (for groundwater users) or other possible pollution prevention and/or control measures;
(B) Evaluate the costs, feasibility and environmental impacts of the potential inorganic arsenic reduction and control measures;
(C) Estimate the predicted reduction in inorganic arsenic and the reduced human health risk expected to result from the control measures;
(D) Propose specific inorganic arsenic reduction or control measures, if feasible, and an implementation schedule; and
(E) Propose monitoring and reporting requirements to document progress in plan implementation and the inorganic arsenic load reductions.
(f) In order to implement this section, DEQ will develop the following information and guidance within 120 days of the effective date of this rule and periodically update it as warranted by new information:
(A) A list of industrial sources or source categories, including industrial stormwater and sources covered by general permits, that are likely to add inorganic arsenic to surface waters of the State.
(i) For industrial sources or source categories permitted under a general permit that have been identified by DEQ as likely sources of inorganic arsenic, DEQ will evaluate options for reducing inorganic arsenic during permit renewal or evaluation of Stormwater Pollution Control Plans.
(B) Quantitation limits for monitoring inorganic arsenic concentrations.
(C) Information and guidance to assist sources in estimating, pursuant to ~~paragraph~~subsection (~~d~~e)(C) of this section, the reduced human health risk expected to result from inorganic arsenic control measures based on the most current EPA risk assessment.
(g) It is the policy of the Commission that landowners engaged in agricultural or development practices on land where pesticides, fertilizers, or soil amendments containing arsenic are currently being or have previously been applied, implement conservation practices to minimize the erosion and runoff of inorganic arsenic to waters of the State or to a location where such material could readily migrate into waters of the State.
[ED. NOTE: Tables referencing the toxics criteria~~ed~~ are not included in rule text. Click here for a PDF copy of Table 30: Aquatic Life Water Quality Criteria for Toxic Pollutants. Click here for a PDF copy of Table 31: Aquatic Life Water Quality Guidance Values for Toxic Pollutants. Click here for a PDF copy of Table 40: Human Health Water Quality Criteria for Toxic Pollutants.~~available from the agency.~~]
Stat. Auth.: ORS 468.020, 468B.030, 468B.035 & 468B.048
Stats. Implemented: ORS 468B.030, 468B.035 & 468B.048
Hist.: DEQ 17-2003, f. & cert. ef. 12-9-03; DEQ 3-2004, f. & cert. ef. 5-28-04; DEQ 17-2010, f. & cert. ef. 12-21-10; DEQ 8-2011, f. & cert. ef. 6-30-11; DEQ 10-2011, f. & cert. ef. 7-13-11

TABLE 30: Aquatic Life Water Quality Criteria for Toxic Pollutants

Effective April 18, 2014

Aquatic Life Criteria Summary

The criteria for each compound listed in Table 30 must not be exceeded in waters of the state in order to protect aquatic life. The aquatic life criteria apply to waterbodies where fish and aquatic life is a designated beneficial use. All values are expressed as micrograms per liter (µg/L). Compounds are listed in alphabetical order with the corresponding information: the Chemical Abstract Service (CAS) number, whether there is a human health criterion for the pollutant (i.e. "y"= yes, "n" = no), and the associated aquatic life freshwater and saltwater acute and chronic criteria. Italicized pollutants are not identified as priority pollutants by EPA. Dashes in the table column indicate that there is no aquatic life criterion for that pollutant.

Unless otherwise noted in the table below, the acute criterion is the Criterion Maximum Concentration (CMC) applied as a one hour average concentration, and the chronic criterion is the Criterion Continuous Concentration (CCC) applied as a 96 hour (4 day) average concentration. The CMC and CCC criteria may not be exceeded more than once every three years. Footnote A, associated with eleven pesticide pollutants in Table 30, describes the exception to the frequency and duration of the toxics criteria stated in this paragraph.

Table 30

Aquatic Life Water Quality Criteria for Toxic Pollutants

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
1	Aldrin	309002	y	3 [A]	--	1.3 [A]	--
[A] *See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.*							
2	*Alkalinity*		n	--	20,000 [B]	--	--
[B] *Criterion shown is the minimum (i.e. CCC in water may not be below this value in order to protect aquatic life).*							
3	*Ammonia*	7664417	n	*Criteria are pH, temperature, and salmonid or sensitive coldwater species dependent--See document USEPA January 1985 (Fresh Water).* [M]		*Ammonia criteria for saltwater may depend on pH and temperature. Values for saltwater criteria (total ammonia) can be calculated from the tables specified in Ambient Water Quality Criteria for Ammonia (Saltwater)--1989 (EPA 440/5-88-004; http://water.epa.gov/scitech/swguidance/standards/criteria/current/index.cfm)*	
[M] *See expanded endnote M equations at bottom of Table 30 to calculate freshwater ammonia criteria*							
4	Arsenic	7440382	y	340 [C, D]	150 [C, D]	69 [C, D]	36 [C, D]
[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.*							

Table 30

Aquatic Life Water Quality Criteria for Toxic Pollutants

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
[D] Criterion is applied as total inorganic arsenic (i.e. arsenic (III) + arsenic (V)).							
5	BHC Gamma (Lindane)	58899	y	0.95	0.08 [A]	0.16 [A]	--
[A] See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.							
6	Cadmium	7440439	n	See **E**	See **C, F**	40 [C]	8.8 [C]
[C] Criterion is expressed in terms of "dissolved" concentrations in the water column.							
[E] The freshwater criterion for this metal is expressed as "total recoverable" and is a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote E at bottom of Table 30.							
[F] The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.							
7	Chlordane	57749	y	2.4 [A]	0.0043 [A]	0.09 [A]	0.004 [A]
[A] See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.							
8	*Chloride*	16887006	n	860,000	230,000	--	--
9	*Chlorine*	7782505	n	19	11	13	7.5
10	*Chlorpyrifos*	2921882	n	0.083	0.041	0.011	0.0056
11	Chromium III	16065831	n	See **C, F**	See **C, F**	--	--
[C] Criterion is expressed in terms of "dissolved" concentrations in the water column.							
[F] The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.							
12	Chromium VI	18540299	n	16 [C]	11 [C]	1100 [C]	50 [C]
[C] Criterion is expressed in terms of "dissolved" concentrations in the water column.							
13	Copper	7440508	y	See **E**	See **E**	4.8 [C]	3.1 [C]
[C] Criterion is expressed in terms of "dissolved" concentrations in the water column.							
[E] The freshwater criterion for this metal is expressed as "total recoverable" and is a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote E at bottom of Table 30.							
14	Cyanide	57125	y	22 [J]	5.2 [J]	1 [J]	1 [J]
[J] This criterion is expressed as µg free cyanide (CN)/L.							
15	DDT 4,4'	50293	y	1.1 [A, G]	0.001 [A, G]	0.13 [A, G]	0.001 [A, G]
[A] See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.							
[G] This criterion applies to DDT and its metabolites (i.e. the total concentration of DDT and its metabolites should not exceed this value).							
16	*Demeton*	8065483	n	--	0.1	--	0.1
17	Dieldrin	60571	y	0.24	0.056	0.71 [A]	0.0019 [A]
[A] See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.							
18	Endosulfan	115297	n	0.22 [A, H]	0.056 [A, H]	0.034 [A, H]	0.0087 [A, H]
[A] See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.							
[H] This value is based on the criterion published in Ambient Water Quality Criteria for Endosulfan (EPA 440/5-80-046) and should be applied as the sum of alpha- and beta-endosulfan.							
19	Endosulfan Alpha	959988	y	0.22 [A]	0.056 [A]	0.034 [A]	0.0087 [A]
[A] See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.							

Table 30

Aquatic Life Water Quality Criteria for Toxic Pollutants

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
20	Endosulfan Beta	33213659	y	0.22 [A]	0.056 [A]	0.034 [A]	0.0087 [A]
	[A] See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.						
21	Endrin	72208	y	0.086	0.036	0.037 [A]	0.0023 [A]
	[A] See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.						
22	*Guthion*	86500	n	--	0.01	--	0.01
23	Heptachlor	76448	y	0.52 [A]	0.0038 [A]	0.053 [A]	0.0036 [A]
	[A] See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.						
24	Heptachlor Epoxide	1024573	y	0.52 [A]	0.0038 [A]	0.053 [A]	0.0036 [A]
	[A] See expanded endnote A at bottom of Table 30 for alternate frequency and duration of this criterion.						
25	*Iron (total)*	7439896	n	--	1000	--	--
26	Lead	7439921	n	*See* **C , F**	*See* **C , F**	210 [C]	8.1 [C]
	[C] Criterion is expressed in terms of "dissolved" concentrations in the water column. [F] The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.						
27	*Malathion*	121755	n	--	0.1	--	0.1
28	Mercury (total)	7439976	n	2.4	0.012	2.1	0.025
29	*Methoxychlor*	72435	y	--	0.03	--	0.03
30	*Mirex*	2385855	n	--	0.001	--	0.001
31	Nickel	7440020	y	*See* **C , F**	*See* **C , F**	74 [C]	8.2 [C]
	[C] Criterion is expressed in terms of "dissolved" concentrations in the water column. [F] The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.						
32	*Parathion*	56382	n	0.065	0.013	--	--
33	Pentachlorophenol	87865	y	*See* **H**	*See* **H**	13	7.9
	[H] Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: CMC=(exp(1.005(pH)-4.869); CCC=exp(1.005(pH)-5.134).						
34	*Phosphorus Elemental*	7723140	n	--	--	--	0.1
35	Polychlorinated Biphenyls (PCBs)	NA	y	2 [K]	0.014 [K]	10 [K]	0.03 [K]
	[K] This criterion applies to total PCBs (e.g. determined as Aroclors or congeners)						
36	Selenium	7782492	y	*See* **C , L**	4.6 [C]	290 [C]	71 [C]
	[C] Criterion is expressed in terms of "dissolved" concentrations in the water column. [L] The CMC=(1/[(f1/CMC1)+(f2/CMC2)]µg/L) * CF where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively,and CMC1 and CMC2 are 185.9 µg/L and 12.82 µg/L, respectively. See expanded endnote F for the Conversion Factor (CF) for selenium.						
37	Silver	7440224	n	*See* **C , F**	0.10 [C]	1.9 [C]	--
	[C] Criterion is expressed in terms of "dissolved" concentrations in the water column. [F] The freshwater acute criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.						

Table 30

Aquatic Life Water Quality Criteria for Toxic Pollutants

	Pollutant	CAS Number	Human Health Criterion	Freshwater (µg/L)		Saltwater (µg/L)	
				Acute Criterion (CMC)	Chronic Criterion (CCC)	Acute Criterion (CMC)	Chronic Criterion (CCC)
38	*Sulfide Hydrogen Sulfide*	7783064	n	--	2	--	2
39	Toxaphene	8001352	y	0.73	0.0002	0.21	0.0002
40	*Tributyltin (TBT)*	688733	n	0.46	0.063	0.37	0.01
41	Zinc	7440666	y	*See* **C , F**	*See* **C , F**	90 [C]	81 [C]

[C] *Criterion is expressed in terms of "dissolved" concentrations in the water column.*

[F] *The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. To calculate the criterion, use formula under expanded endnote F at bottom of Table 30.*

Expanded Endnotes A, E, F, M

Endnote A: Alternate Frequency and Duration for Certain Pesticides

This criterion is based on EPA recommendations issued in 1980 that were derived using guidelines that differed from EPA's 1985 Guidelines which update minimum data requirements and derivation procedures. The CMC may not be exceeded at any time and the CCC may not be exceeded based on a 24-hour average. The CMC may be applied using a one hour averaging period not to be exceeded more than once every three years, if the CMC values given in Table 30 are divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.

Endnote E: Equations for Hardness-Dependent Freshwater Metals Criteria for Cadmium Acute and Copper Acute and Chronic Criteria

The freshwater criterion for this metal is expressed as total recoverable with two significant figures, and is a function of hardness (mg/L) in the water column. Criteria values for hardness are calculated using the following formulas (CMC refers to the acute criterion; CCC refers to the chronic criterion):

$$\textbf{CMC} = (\exp(m_A*[\ln(\text{hardness})] + b_A))$$
$$\textbf{CCC} = (\exp(m_C*[\ln(\text{hardness})] + b_C))$$

Chemical	m_A	b_A	m_C	b_C
Cadmium	1.128	-3.828	N/A	N/A
Copper	0.9422	-1.464	0.8545	-1.465

Endnote F: Equations for Hardness-Dependent Freshwater Metals Criteria and Conversion Factor Table

The freshwater criterion for this metal is expressed as dissolved with two significant figures, and is a function of hardness (mg/L) in the water column. Criteria values for hardness are calculated using the following formulas (CMC refers to the acute criterion; CCC refers to the chronic criterion):

$$\textbf{CMC} = (\exp(m_A*[\ln(\text{hardness})] + b_A))*CF$$
$$\textbf{CCC} = (\exp(m_C*[\ln(\text{hardness})] + b_C))*CF$$

"CF" is the conversion factor used for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column.

Chemical	m_A	b_A	m_C	b_C
Cadmium	N/A	N/A	0.7409	-4.719
Chromium III	0.8190	3.7256	0.8190	0.6848
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	2.255	0.8460	0.0584
Silver	1.72	-6.59	--	--
Zinc	0.8473	0.884	0.8473	0.884

The conversion factors (CF) below must be used in the equations above for the hardness-dependent metals in order to convert total recoverable metals criteria to dissolved metals criteria. For metals that are not hardness-dependent (i.e. arsenic, chromium VI, selenium, and silver (chronic)), or are saltwater criteria, the criterion value associated with the metal in Table 30 already reflects a dissolved criterion based on its conversion factor below.

Conversion Factor (CF) Table for Dissolved Metals

Chemical	Freshwater		Saltwater	
	Acute	Chronic	Acute	Chronic
Arsenic	1.000	1.000	1.000	1.000
Cadmium	N/A	1.101672-[(ln hardness)(0.041838)]	0.994	0.994
Chromium III	0.316	0.860	--	--
Chromium VI	0.982	0.962	0.993	0.993
Copper	N/A	N/A	0.83	0.83
Lead	1.46203-[(ln hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]	0.951	0.951
Nickel	0.998	0.997	0.990	0.990
Selenium	0.996	0.922	0.998	0.998
Silver	0.85	0.85	0.85	--
Zinc	0.978	0.986	0.946	0.946

Endnote M: Equations for Freshwater Ammonia Calculations

Acute Criterion

The 1-hour average concentration of un-ionized ammonia (mg/L NH3) may not exceed more often than once every three years on average, the numerical value given by:

CMC_{NH3} = 0.52/FT/FPH/2 where:

FT = temperature adjustment factor
FPH = pH adjustment factor
TCAP = temperature cap

$FT = 10^{0.03(20-TCAP)}$; TCAP ≤ T ≤ 30° C
$FT = 10^{0.03(20-T)}$; 0 ≤ T ≤ TCAP
FPH = 1 8≤ pH ≤ 9
$FPH = \frac{1 + 10^{7.4-pH}}{1.25}$ 6.5 ≤ pH ≤ 8

TCAP = 20 ˚C; Salmonids and other sensitive coldwater species present
TCAP = 25 ˚C; Salmonids and other sensitive coldwater species absent

Chronic Criterion

The 4-day average concentration of un-ionized ammonia (mg/L NH_3) may not exceed more often than once every three years on average, the average numerical value given by:

$CCC_{NH3} = 0.80/FT/FPH/RATIO$

where FT and FPH are as above for acute criterion and:

RATIO = 16 *where* $7.7 \leq pH \leq 9$

RATIO = $24 \times \left[\frac{10^{7.7 - pH}}{1 + 10^{7.4 - pH}} \right]$ *where* $6.5 \leq pH \leq 7.7$

TCAP = 15 ˚C; Salmonids and other sensitive coldwater species present
TCAP = 20 ˚C; Salmonids and other sensitive coldwater species absent

TABLE ~~Table~~ 31~~3C~~: Aquatic Life Water Quality Guidance Values for Toxic Pollutants

Effective April 18, 2014

~~WATER QUALITY GUIDANCE VALUES SUMMARY~~ Water Quality Guidance Values Summary [A]

The concentration for each compound listed in Table 31~~3c~~ is a guidance value that can be used in application of Oregon's ~~Narrative~~ Toxic~~s~~ Substances Narrative ~~Criteria~~ (340-041-0033(21~~)~~)) to waters of the state in order to protect aquatic life. All values are expressed as micrograms per liter (µg/L) except where noted. Compounds are listed in alphabetical order with the corresponding EPA number (from National Recommended Water Quality Criteria: 2002, EPA-822-R-02-047), corresponding Chemical Abstract Service (CAS) number, aquatic life freshwater acute and chronic guidance values, and aquatic life saltwater acute and chronic guidance values.

Table 31

Aquatic Life Water Quality Guidance Values for Toxic Pollutants

EPA No.	Pollutant~~Compound~~	CAS Number	Freshwater		Saltwater	
			Acute	Chronic	Acute	Chronic
56	Acenaphthene	83329	1,700	520	970	710
17	Acrolein	107028	68	21	55	
18	Acrylonitrile	107131	7,550	2,600		
1	Antimony	7440360	9,000	1,600		
~~2~~	~~Arsenic~~	~~7440382~~	~~850~~	~~48~~	~~2,310~~	~~13~~
19	Benzene	71432	5,300		5,100	700
59	Benzidine	92875	2,500			
3	Beryllium	7440417	130	5.3		
19 B	BHC (Hexachlorocyclohexane-Technical)	319868	100		0.34	
21	Carbon Tetrachloride	56235	35,200		50,000	
	Chlorinated Benzenes		250	50	160	129
	Chlorinated naphthalenes		1,600		7.5	
	Chloroalkyl Ethers		238,000			
26	Chloroform	67663	28,900	1,240		
45	Chlorophenol 2-	95578	4,380	2,000		
	Chlorophenol 4-	106489			29,700	
52	Methyl-4-chlorophenol 3-	59507	30			
5a	Chromium (III)	16065831			10,300	
109	DDE 4,4'-	72559	1,050		14	
110	DDD 4,4'-	72548	0.06		3.6	
	Diazinon	333415	0.08	0.05		
	Dichlorobenzenes		1,120	763	1,970	
29	Dichloroethane 1,2-	107062	118,000	20,000	113,000	
	Dichloroethylenes		11,600		224.000	
46	Dichlorophenol 2,4-	120832	2,020	365		
31	Dichloropropane 1,2-	78875	23,000	5,700	10,300	3,040
32	Dichloropropene 1,3-	542756	6,060	244	790	

Table 31

Aquatic Life Water Quality Guidance Values for Toxic Pollutants

EPA No.	Pollutant~~Compound~~	CAS Number	Freshwater		Saltwater	
			Acute	Chronic	Acute	Chronic
47	Dimethylphenol 2,4-	105679	2,120			
	Dinitrotoluene		330	230	590	370
16	Dioxin (2,3,7,8-TCDD)	1746016	0.01	38pg/L		
85	Diphenylhydrazine 1,2-	122667	270			
33	Ethylbenzene	100414	32,000		430	
86	Fluoranthene	206440	3,980		40	16
	Haloethers		360	122		
	Halomethanes		11,000		12,000	6,400
89	Hexachlorobutadiene	87683	90	9.3	32	
90	Hexachlorocyclopentadiene	77474	7	5.2	7	
91	Hexachloroethane	67721	980	540	940	
93	Isophorone	78591	117,000		12,900	
94	Naphthalene	91203	2,300	620	2,350	
95	Nitrobenzene	98953	27,000		6,680	
	Nitrophenols		230	150	4,850	
26 B	Nitrosamines	35576911	5,850		3,300,000	
	Pentachlorinated ethanes		7,240	1,100	390	281
54	Phenol	108952	10,200	2,560	5,800	
	Phthalate esters		940	3	2,944	3.4
	Polynuclear Aromatic Hydrocarbons				300	
	Tetrachlorinated Ethanes		9,320			
37	Tetrachloroethane 1,1,2,2-	79345		2,400	9,020	
	Tetrachloroethanes		9,320			
38	Tetrachloroethylene	127184	5,280	840	10,200	450
	Tetrachlorophenol 2,3,5,6					440
12	Thallium	7440280	1,400	40	2,130	
39	Toluene	108883	17,500		6,300	5,000
	Trichlorinated ethanes		18,000			
41	Trichloroethane 1,1,1-	71556			31,200	
42	Trichloroethane 1,1,2-	79005		9,400		
43	Trichloroethylene	79016	45,000	21,900	2,000	
55	Trichlorophenol 2,4,6-	88062		970		

The following chemicals/compounds/classes are of concern due to the potential for toxic effects to aquatic organisms; however, no guidance values are designated. If these compounds are identified in the waste stream, then a review of the scientific literature may be appropriate for deriving guidance values.

- Polybrominated diphenyl ethers (PBDE)
- Polybrominated biphenyls (PBB)
- Pharmaceuticals
- Personal care products
- Alkyl Phenols
- Other chemicals with Toxic effects

Footnotes:

A Values in Table 31~~3c~~ are applicable to all basins.

B This number was assigned to the list of non-priority pollutants in National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047).

TABLE 40: Human Health Water Quality Criteria for Toxic Pollutants

Effective April 18, 2014~~October 17, 2011~~

Human Health Criteria Summary

The concentration for each pollutant listed in Table 40 was derived to protect Oregonians from potential adverse health impacts associated with long-term exposure to toxic substances associated with consumption of fish, shellfish, and water. The "organism only" criteria are established to protect fish and shellfish consumption and apply to waters of the state designated for fishing. The "water + organism" criteria are established to protect the consumption of drinking water, fish, and shellfish, and apply where both fishing and domestic water supply (public and private) are designated uses. All criteria are expressed as micrograms per liter (µg/L), unless otherwise noted. Pollutants are listed in alphabetical order. Additional information includes the Chemical Abstract Service (CAS) number, whether the criterion is based on carcinogenic effects (can cause cancer in humans), and whether there is an aquatic life criterion for the pollutant (i.e. "y"= yes, "n" = no). All the human health criteria were calculated using a fish consumption rate of 175 grams per day unless otherwise noted. A fish consumption rate of 175 grams per day is approximately equal to 23 8-ounce fish meals per month. For pollutants categorized as carcinogens, values represent a cancer risk of one additional case of cancer in one million people (i.e. 10^{-6}), unless otherwise noted. All metals criteria are for total metal concentration, unless otherwise noted. Italicized pollutants represent non-priority pollutants. The human health criteria revisions established by OAR 340-041-0033 and shown in Table 40 do not become applicable for purposes of ORS chapter 468B or the federal Clean Water Act until approved by EPA pursuant to 40 CFR 131.21 (4/27/2000).

Table 40

Human Health Water Quality Criteria for Toxic Pollutants

No.	Pollutant	CAS Number~~o.~~	Carcinogen	Aquatic Life Criterion	*Human Health Criteria for the Consumption of:*	
					Water + Organism (µg/L)	Organism Only (µg/L)
1	Acenaphthene	83329	n	n	95	99
2	Acrolein	107028	n	n	0.88	0.93
3	Acrylonitrile	107131	y	n	0.018	0.025
4	Aldrin	309002	y	y	0.0000050	0.0000050
5	Anthracene	120127	n	n	2900	4000
6	Antimony	7440360	n	n	5.1	64
7	Arsenic (inorganic) [A]	7440382	y	~~n~~ y	2.1	2.1(freshwater) 1.0 (saltwater)
	[A] *The arsenic criteria are expressed as total inorganic arsenic. The "organism only" freshwater criterion~~a~~ is~~are~~ based on a risk level of approximately ~~of~~ 1.~~1~~ x 10^{-5}, and the "water + organism" criterion is based on a risk level of 1 x 10^{-4}.*					
8	Asbestos [B]	1332214	y	n	7,000,000 fibers/L	--
	[B] *The human health risks from asbestos are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
9	*Barium* [C]	7440393	n	n	1000	--

Table 40

Human Health Water Quality Criteria for Toxic Pollutants

No.	Pollutant	CAS Number~~o.~~	Carcinogen	Aquatic Life Criterion	*Human Health Criteria for the Consumption of:*	
					Water + Organism (µg/L)	Organism Only (µg/L)
	[C] *The human health criterion for barium is the same as originally published in the 1976 EPA Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value was also published in the 1986 EPA Gold Book. Human health risks are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
10	Benzene	71432	y	n	0.44	1.4
11	Benzidine	92875	y	n	0.000018	0.000020
12	Benz(a)anthracene	56553	y	n	0.0013	0.0018
13	Benzo(a)pyrene	50328	y	n	0.0013	0.0018
14	Benzo(b)fluoranthene 3,4	205992	y	n	0.0013	0.0018
15	Benzo(k)fluoranthene	207089	y	n	0.0013	0.0018
16	BHC Alpha	319846	y	n	0.00045	0.00049
17	BHC Beta	319857	y	n	0.0016	0.0017
18	BHC Gamma (Lindane)	58899	n	y	0.17	0.18
19	Bromoform	75252	y	n	3.3	14
20	Butylbenzyl Phthalate	85687	n	n	190	190
21	Carbon Tetrachloride	56235	y	n	0.10	0.16
22	Chlordane	57749	y	y	0.000081	0.000081
23	Chlorobenzene	108907	n	n	74	160
24	Chlorodibromomethane	124481	y	n	0.31	1.3
25	Chloroethyl Ether bis 2	111444	y	n	0.020	0.053 [should reflect 2 significant digits]
26	Chloroform	67663	n	n	260	1100
27	Chloroisopropyl Ether bis 2	108601	n	n	1200	6500
28	*Chloromethyl ether, bis*	542881	y	n	0.000024	0.000029
29	Chloronaphthalene 2	91587	n	n	150	160
30	Chlorophenol 2	95578	n	n	14	15
31	*Chlorophenoxy Herbicide (2,4,5,-TP)* [D]	93721	n	n	10	--
	[D] *The Chlorophenoxy Herbicide (2,4,5,-TP) criterion is the same as originally published in the 1976 EPA Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value was also published in the 1986 EPA Gold Book. Human health risks are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
32	*Chlorophenoxy Herbicide (2,4-D)* [E]	94757	n	n	100	--
	[E] *The Chlorophenoxy Herbicide (2,4-D) criterion is the same as originally published in the 1976 EPA Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value was also published in the 1986 EPA Gold Book. Human health risks are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					

Table 40

Human Health Water Quality Criteria for Toxic Pollutants

No.	Pollutant	CAS Number~~o.~~	Carcinogen	Aquatic Life Criterion	*Human Health Criteria for the Consumption of:*	
					Water + Organism (µg/L)	Organism Only (µg/L)
33	Chrysene	218019	y	n	0.0013	0.0018
34	Copper[F]	7440508	n	y	1300	--
	[F] *Human health risks from copper are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
35	Cyanide[G]	57125	n	y	130	130
	[G] *The cyanide criterion is expressed as total cyanide (CN)/L.*					
36	DDD 4,4'	72548	y	n	0.000031	0.000031
37	DDE 4,4'	72559	y	n	0.000022	0.000022
38	DDT 4,4'	50293	y	y	0.000022	0.000022
39	Dibenz(a,h)anthracene	53703	y	n	0.0013	0.0018
40	Dichlorobenzene(m) 1,3	541731	n	n	80	96
41	Dichlorobenzene(o) 1,2	95501	n	n	110	130
42	Dichlorobenzene(p) 1,4	106467	n	n	16	19
43	Dichlorobenzidine 3,3'	91941	y	n	0.0027	0.0028
44	Dichlorobromomethane	75274	y	n	0.42	1.7
45	Dichloroethane 1,2	107062	y	n	0.35	3.7
46	Dichloroethylene 1,1	75354	n	n	230	710
47	Dichloroethylene trans 1,2	156605	n	n	120	1000
48	Dichlorophenol 2,4	120832	n	n	23	29
49	Dichloropropane 1,2	78875	y	n	0.38	1.5
50	Dichloropropene 1,3	542756	y	n	0.30	2.1
51	Dieldrin	60571	y	y	0.0000053	0.0000054
52	Diethyl Phthalate	84662	n	n	3800	4400
53	Dimethyl Phthalate	131113	n	n	84000	110000
54	Dimethylphenol 2,4	105679	n	n	76	85
55	Di-n-butyl Phthalate	84742	n	n	400	450
56	Dinitrophenol 2,4	51285	n	n	62	530
57	*Dinitrophenols*	25550587	n	n	62	530
58	Dinitrotoluene 2,4	121142	y	n	0.084	0.34
59	Dioxin (2,3,7,8-TCDD)	1746016	y	n	0.00000000051	0.00000000051
60	Diphenylhydrazine 1,2	122667	y	n	0.014	0.020
61	Endosulfan Alpha	959988	n	y	8.5	8.9
62	Endosulfan Beta	33213659	n	y	8.5	8.9
63	Endosulfan Sulfate	1031078	n	n	8.5	8.9
64	Endrin	72208	n	y	0.024	0.024
65	Endrin Aldehyde	7421934	n	n	0.030	0.030
66	Ethylbenzene	100414	n	n	160	210
67	Ethylhexyl Phthalate bis 2	117817	y	n	0.20	0.22
68	Fluoranthene	206440	n	n	14	14
69	Fluorene	86737	n	n	390	530

Table 40

Human Health Water Quality Criteria for Toxic Pollutants

No.	Pollutant	CAS Number~~o.~~	Carcinogen	Aquatic Life Criterion	*Human Health Criteria for the Consumption of:*	
					Water + Organism (µg/L)	Organism Only (µg/L)
70	Heptachlor	76448	y	y	0.0000079	0.0000079
71	Heptachlor Epoxide	1024573	y	y	0.0000039	0.0000039
72	Hexachlorobenzene	118741	y	n	0.000029	0.000029
73	Hexachlorobutadiene	87683	y	n	0.36	1.8
74	*Hexachlorocyclo-hexane-Technical*	608731	y	n	0.0014	0.0015
75	Hexachlorocyclopentadiene	77474	n	n	30	110
76	Hexachloroethane	67721	y	n	0.29	0.33
77	Indeno(1,2,3-cd)pyrene	193395	y	n	0.0013	0.0018
78	Isophorone	78591	y	n	27	96
79	*Manganese* [H]	7439965	n	n	--	100
	[H] *The "fish consumption only" criterion for manganese applies only to salt water and is for total manganese. This EPA recommended criterion predates the 1980 human health methodology and does not utilize the fish ingestion BCF calculation method or a fish consumption rate.*					
80	*Methoxychlor* [I]	72435	n	y	100	--
	[I] *The human health criterion for methoxychlor is the same as originally published in the 1976 EPA Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value was also published in the1986 EPA Gold Book. Human health risks are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
81	Methyl Bromide	74839	n	n	37	150
82	Methyl-4,6-dinitrophenol 2	534521	n	n	9.2	28
83	Methylene Chloride	75092	y	n	4.3	59
84	Methylmercury (mg/kg) [J]	22967926	n	n	--	0.040 mg/kg
	[J] *This value is expressed as the fish tissue concentration of methylmercury. Contaminated fish and shellfish is the primary human route of exposure to methylmercury*					
85	Nickel	7440020	n	~~n~~ y	140	170
86	*Nitrates* [K]	14797558	n	n	10000	--
	[K] *The human health criterion for nitrates is the same as originally published in the 1976 EPA Red Book which predates the 1980 methodology and did not utilize the fish ingestion BCF approach. This same criterion value was also published in the 1986 EPA Gold Book. Human health risks are primarily from drinking water, therefore no "organism only" criterion was developed. The "water + organism" criterion is based on the Maximum Contaminant Level (MCL) established under the Safe Drinking Water Act.*					
87	Nitrobenzene	98953	n	n	14	69
88	*Nitrosamines*	35576911	y	n	0.00079	0.046
89	*Nitrosodibutylamine, N*	924163	y	n	0.0050	0.022
90	*Nitrosodiethylamine, N*	55185	y	n	0.00079	0.046
91	Nitrosodimethylamine, N	62759	y	n	0.00068	0.30
92	Nitrosodi-n-propylamine, N	621647	y	n	0.0046	0.051
93	Nitrosodiphenylamine, N	86306	y	n	0.55	0.60
94	*Nitrosopyrrolidine, N*	930552	y	n	0.016	3.4
95	*Pentachlorobenzene*	608935	n	n	0.15	0.15
96	Pentachlorophenol	87865	y	y	0.15	0.30

Table 40 **Human Health Water Quality Criteria for Toxic Pollutants**						
No.	**Pollutant**	**CAS Numbero.**	**Carcinogen**	**Aquatic Life Criterion**	***Human Health Criteria for the Consumption of:***	
					Water + Organism (µg/L)	**Organism Only (µg/L)**
97	Phenol	108952	n	n	9400	86000
98	Polychlorinated Biphenyls (PCBs) L	NA	y	y	0.0000064	0.0000064
	L *This criterion applies to total PCBs (e.g. determined as Aroclors or congeners).*					
99	Pyrene	129000	n	n	290	400
100	Selenium	7782492	n	~~n~~ y	120	420
101	*Tetrachlorobenzene, 1,2,4,5-*	95943	n	n	0.11	0.11
102	Tetrachloroethane 1,1,2,2	79345	y	n	0.12	0.40
103	Tetrachloroethylene	127184	y	n	0.24	0.33
104	Thallium	7440280	n	n	0.043	0.047
105	Toluene	108883	n	n	720	1500
106	Toxaphene	8001352	y	y	0.000028	0.000028
107	Trichlorobenzene 1,2,4	120821	n	n	6.4	7.0
108	Trichloroethane 1,1,2	79005	y	~~y~~ n	0.44	1.6
109	Trichloroethylene	79016	y	n	1.4	3.0
110	Trichlorophenol 2,4,6	88062	y	n	0.23	0.24
111	*Trichlorophenol, 2, 4, 5-*	95954	n	n	330	360
112	Vinyl Chloride	75014	y	n	0.023	0.24
113	Zinc	7440666	n	~~n~~ y	2100	2600

~~TABLE 20~~

~~*AQUATIC LIFE WATER QUALITY CRITERIA SUMMARY*~~[1]

~~The concentration for each compound listed in Table 20 is a criterion not to be exceeded in waters of the state in order to protect aquatic life. All values are expressed as micrograms per liter (µg/L) except where noted. Compounds are listed in alphabetical order with the corresponding designations as to whether EPA has identified it as a priority pollutant and a carcinogen, aquatic life freshwater acute and chronic criteria, aquatic life marine acute and chronic criteria. The acute criteria refer to the average concentration for one (1) hour and the chronic criteria refer to the average concentration for 96 hours (4 days), and that these criteria should not be exceeded more than once every three (3) years.~~

Compound Name (or Class)	Priority Pollutant	Concentration in Micrograms Per Liter for Protection of Aquatic Life			
		Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria
Acenapthene	Y				
Acrolein	Y				
Acrylonitrile	Y				
Aldrin	Y	3		1.3	
Alkalinity	N		20,000		
Ammonia	N	CRITERIA ARE pH AND TEMPERATURE DEPENDENT—SEE DOCUMENT USEPA JANUARY 1985 (Fresh Water) CRITERIA ARE pH AND TEMPERATURE DEPENDENT—SEE DOCUMENT USEPA APRIL 1989 (Marine Water)			
Antimony	Y				
Arsenic	Y				
Arsenic (Pent)	Y				
Arsenic (Tri)	Y	360	190	69	36
Asbestos	Y				
Barium	N				
Benzene	Y				
Benzidine	Y				
Beryllium	Y				
BHC	Y				
Cadmium	Y	3.9+	1.1+	43	9.3
Carbon Tetrachloride	Y				
Chlordane	Y	2.4	0.0043	0.09	0.004
Chloride	N	860 mg/L	230 mg/L		
Chlorinated Benzenes	Y				
Chlorinated Naphthalenes	Y				
Chlorine	N	19	11	13	7.5
Chloroalkyl Ethers	Y				
Chloroethyl Ether (Bis-2)	Y				
Chloroform	Y				
Chloroisopropyl Ether (Bis-2)	Y				
Chloromethyl Ether (Bis)	N				
Chlorophenol 2	Y				
Chlorophenol 4	N				
Chlorophenoxy Herbicides (2,4,5,-Tp)	N				
Chlorophenoxy Herbicides (2,4-D)	N				
Chlorpyrifos	N	0.083	0.041	0.011	0.0056
Chloro-4 Methyl-3 Phenol	N				
Chromium (Hex)	Y	16	11	1,100	50
Chromium (Tri)	N	1,700.+	210.+		
Copper	Y	18.+	12.+	2.9	2.9
Cyanide	Y	22	5.2	1	1
DDT	Y	1.1	0.001	0.13	0.001
(TDE) DDT Metabolite	Y				
(DDE) DDT Metabolite	Y				
Demeton	Y		0.1		0.1
Dibutylphthalate	Y				
Dichlorobenzenes	Y				
Dichlorobenzidine	Y				
Dichloroethane 1,2	Y				

Compound Name (or Class)	Priority Pollutant	Concentration in Micrograms Per Liter for Protection of Aquatic Life			
		Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria
Dichloroethylenes	Y				
Dichlorophenol 2,4	N				
Dichloropropane	Y				
Dichloropropene	Y				
Dieldrin	Y	2.5	0.0019	0.71	0.0019
Diethylphthalate	Y				
Dimethyl Phenol 2,4	Y				
Dimethyl Phthalate	Y				
Dinitrotoluene 2,4	N				
Dinitrotoluene	Y				
Dinitrotoluene	N				
Dinitro-o-Cresol 2,4	Y				
Dioxin (2,3,7,8-Tcdd)	Y				
Diphenylhydrazine	Y				
Diphenylhydrazine 1,2	Y				
Di-2-Ethylhexyl Phthalate	Y				
Endosulfan	Y	0.22	0.056	0.034	0.0087
Endrin	Y	0.18	0.0023	0.037	0.0023
Ethylbenzene	Y				
Fluoranthene	Y				
Guthion	N		0.01		0.01
Haloethers	Y				
Halomethanes	Y				
Heptachlor	Y	0.52	0.0038	0.053	0.0036
Hexachloroethane	N				
Hexachlorobenzene	Y				
Hexachlorobutadiene	Y				
Hexachlorocyclohexane (Lindane)	Y	2	0.08	0.16	
Hexachlorocyclohexane-Alpha	Y				
Hexachlorocyclohexane-Beta	Y				
Hexachlorocyclohexane-Gama	Y				
Hexachlorocyclohexane-Technical	Y				
Hexachlorocyclopentadiene	Y				
Iron	N		1,000		
Isophorone	Y				
Lead	Y	82+	3.2+	140	5.6
Malathion	N		0.1		0.1
Manganese	N				
Mercury	Y	2.4	0.012	2.1	0.025
Methoxychlor	N		0.03		0.03
Mirex	N		0.001		0.001
Monochlorobenzene	Y				
Naphthalene	Y				
Nickel	Y	1,400+	160+	75	8.3
Nitrates	N				
Nitrobenzene	Y				
Nitrophenols	Y				
Nitrosamines	Y				
Nitrosodibutylamine N	Y				

Compound Name (or Class)	Priority Pollutant	Concentration in Micrograms Per Liter for Protection of Aquatic Life			
		Fresh Acute Criteria	Fresh Chronic Criteria	Marine Acute Criteria	Marine Chronic Criteria
Nitrosodiethylamine N	Y				
Nitrosodimethylamine N	Y				
Nitrosodiphenylamine N	Y				
Nitrosopyrrolidine N	Y				
Parathion	N	0.065	0.013		
PCB's	Y	2	0.014	10	0.03
Pentachlorinated Ethanes	N				
Pentachlorobenzene	N				
Pentachlorophenol	Y	***20	***13	13	
Phenol	Y				
Phosphorus Elemental	N				0.1
Phthalate Esters	Y				
Polynuclear Aromatic Hydrocarbons	Y				
Selenium	Y	260	35	410	54
Silver	Y	4.1+	0.12	2.3	
Sulfide Hydrogen Sulfide	N		2		2
Tetrachlorinated Ethanes	Y				
Tetrachlorobenzene 1,2,4,5	Y				
Tetrachloroethane 1,1,2,2	Y				
Tetrachloroethanes	Y				
Tetrachloroethylene	Y				
Tetrachlorophenol 2,3,5,6	Y				
Thallium	Y				
Toluene	Y				
Toxaphene	Y	0.73	0.0002	0.21	0.0002
Trichlorinated Ethanes	Y				
Trichloroethane 1,1,1	Y				
Trichloroethane 1,1,2	Y				
Trichloroethylene	Y				
Trichlorophenol 2,4,5	N				
Trichlorophenol 2,4,6	Y				
Vinyl Chloride	Y				
Zinc	Y	120+	110+	95	86

MEANING OF SYMBOLS:

g = grams
mg = milligrams
+ = Hardness Dependent Criteria (100 mg/L used).

The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. Criteria values for hardness may be calculated from the following formulae (CMC refers to Acute Criteria; CCC refers to Chronic Criteria):

Chemical	m_A	b_A	m_C	b_C
Cadmium	1.128	-3.828	0.7852	-3.49

CMC = (exp(m_A*[ln(hardness)] + b_A))*CF
CCC = (exp(m_C*[ln(hardness)] + b_C))*CF

Chromium III	0.819	3.688	0.819	1.561
Copper	0.9422	-1.464	0.8545	-1.465
Lead	1.273	-1.46	1.273	-4.705
Nickel	0.846	3.3612	0.846	1.1645
Silver	1.72	-6.52	-	-
Zinc	0.8473	0.8604	0.8473	0.7614

ug = micrograms
* = Insufficient data to develop criteria; value presented is the L.O.E.L – Lower Observed Effect Level.
ng = nanograms
pg = picograms
*** = pH Dependent Criteria (7.8 pH used).
Y = Yes
N = No
1 = Values in Table 20 are applicable to all basin

TABLE 33A

Note: The Environmental Quality Commission adopted the following criteria on May 20, 2004 to become effective February 15, 2005. However, EPA has not yet (as of June 2006) approved the criteria. Thus, Table 33A criteria may be used in NPDES permits, but not for the section 303(d) list of impaired waters.

AQUATIC LIFE WATER QUALITY CRITERIA SUMMARY[A]

The concentration for each compound listed in Table 33A is a criterion not to be exceeded in waters of the state in order to protect aquatic life. All values are expressed as micrograms per liter (µg/L) except where noted. Compounds are listed in alphabetical order with the corresponding EPA number (from National Recommended Water Quality Criteria: 2002, EPA-822-R-02-047), the Chemical Abstract Service (CAS) number, aquatic life freshwater acute and chronic criteria, aquatic life saltwater acute and chronic criteria. The acute criteria refer to the average concentration for one (1) hour and the chronic criteria refer to the average concentration for 96 hours (4 days), and that these criteria should not be exceeded more than once every three (3) years.

EPA No.	Compound	CAS Number	Freshwater				Saltwater			
			Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date
56	Acenaphthene	83329								

EPA No.	Compound	CAS Number	Freshwater				Saltwater			
			Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date
57	Acenaphthylene	208968								
17	Acrolein	107028								
18	Acrylonitrile	107131								
102	Aldrin	309002	3 O	X			1.3 O	X		
1 N	Alkalinity				20,000 P					
2 N	Aluminum (pH 6.5 - 9.0)	7429905								
3 N	Ammonia	7664417					D	X	D	X
58	Anthracene	120127								
1	Antimony	7440360								
2	Arsenic	7440382								
15	Asbestos	1332214								
6 N	Barium	7440393								
19	Benzene	71432								
59	Benzidine	92875								
60	Benzo(a)Anthracene	56553								
61	Benzo(a)Pyrene	50328								
62	Benzo(b)Fluoranthene	205992								
63	Benzo(g,h,i)Perylene	191242								
64	Benzo(k)Fluoranthene	207089								
3	Beryllium	7440417								
103	BHC-alpha-	319846								
104	BHC-beta-	319857								
106	BHC-delta-	319868								
105	BHC-gamma- (Lindane)	58899	0.95		0.08	X	0.16 O			
7 N	Boron	7440428								
20	Bromoform	75252								
69	Bromophenyl Phenyl Ether 4-									
70	Butylbenzyl Phthalate	85687								
4	Cadmium	7440439								
21	Carbon Tetrachloride	56235								
107	Chlordane	57749	2.4 O	X	0.0043 O	X	0.09 O	X	0.004 O	X
8 N	Chloride	16887006	860000		230000					
9 N	Chlorine	7782505	19	X	11	X	13	X	7.5	X
22	Chlorobenzene	108907								
23	Chlorodibromomethane	124481								
24	Chloroethane	75003								
65	ChloroethoxyMethane Bis2-	111911								
66	ChloroethylEther Bis2-	111444								
25	Chloroethylvinyl Ether 2-	110758								
26	Chloroform	67663								
67	ChloroisopropylEther Bis2-	108601								
15 N	ChloromethylEther, Bis	542881								
71	Chloronaphthalene 2-	91587								
45	Chlorophenol 2-	95578								
10 N	Chlorophenoxy Herbicide (2,4,5, TP)	93721								
11 N	Chlorophenoxy Herbicide (2,4-D)	94757								
72	Chlorophenyl Phenyl Ether 4-	7005723								
12 N	Chloropyrifos	2921882	0.083	X	0.041	X	0.011	X	0.0056	X
5a	Chromium (III)									
5b	Chromium (VI)	18540299								

EPA No.	Compound	CAS Number	Freshwater				Saltwater			
			Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date
73	Chrysene	218019								
6	Copper	7440508								
14	Cyanide	57125	22 S	X	5.2 S	X	1 S	X	1 S	X
108	DDT 4,4'-	50293	1.1 O,T	X	0.001 O,T	X	0.13 O,T	X	0.001 O,T	X
109	DDE 4,4'-	72559								
110	DDD 4,4'-	72548								
14 N	Demeton	8065483			0.1	X			0.1	X
74	Dibenzo(a,h)Anthracene	53703								
75	Dichlorobenzene 1,2-	95501								
76	Dichlorobenzene 1,3-	541731								
77	Dichlorobenzene 1,4-	106467								
78	Dichlorobenzidine 3,3'-	91941								
27	Dichlorobromomethane	75274								
28	Dichloroethane 1,1-	75343								
29	Dichloroethane 1,2-	107062								
30	Dichloroethylene 1,1-	75354								
46	Dichlorophenol 2,4-	120832								
31	Dichloropropane 1,2-	78875								
32	Dichloropropene 1,3-	542756								
111	Dieldrin	60571	0.24				0.71 O	X	0.0019 O	X
79	DiethylPhthalate	84662								
47	Dimethylphenol 2,4-	105679								
80	DimethylPhthalate	131113								
81	Di-n-Butyl Phthalate	84742								
49	Dinitrophenol 2,4-	51285								
27 N	Dinitrophenols	25550587								
82	Dinitrotoluene 2,4-	121142								
83	Dinitrotoluene 2,6-	606202								
84	Di-n-Octyl Phthalate	117840								
16	Dioxin (2,3,7,8-TCDD)	1746016								
85	Diphenylhydrazine 1,2-	122667								
68	EthylhexylPhthalate Bis2-	117817								
	Endosulfan		0.22 I,P	X	0.056 I,P	X	0.034 I,P	X	0.0087 I,P	X
112	Endosulfan alpha-	959988	0.22 O		0.056 O		0.034 O		0.0087 O	
113	Endosulfan beta-	33213659	0.22 O		0.056 O		0.034 O		0.0087 O	
114	Endosulfan Sulfate	1031078								
115	Endrin	72208	0.086				0.037 O		0.0023 O	
116	Endrin Aldehyde	7421934								
33	Ethylbenzene	100414								
86	Fluoranthene	206440								
87	Fluorene	86737								
17 N	Guthion	86500			0.01	X			0.01	X
117	Heptachlor	76448	0.52 O	X	0.0038 O	X	0.053 O	X	0.0036 O	X
118	Heptachlor Epoxide	1024573	0.52 O		0.0038 O		0.053 O		0.0036 O	
88	Hexachlorobenzene	118741								
89	Hexachlorobutadiene	87683								
91	Hexachloroethane	67721								
19 N	Hexachlorocyclo-hexane-Technical	319868								
90	Hexachlorocyclopentadiene	77474								
92	Ideno1,2,3-(cd)Pyrene	193395								
20 N	Iron	7439896			1,000	X				

EPA No.	Compound	CAS Number	Freshwater				Saltwater			
			Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date
93	Isophorone	78591								
7	Lead	7439921								
21 N	Malathion	121755			0.1	X			0.1	X
22 N	Manganese	7439965								
8a	Mercury	7439976	2.4	X	0.012	X	2.1	X	0.025	X
23 N	Methoxychlor	72435			0.03	X			0.03	X
34	Methyl Bromide	74839								
35	Methyl Chloride	74873								
48	Methyl-4,6-Dinitrophenol 2-	534521								
52	Methyl-4-Chlorophenol 3-	59507								
36	Methylene Chloride	75092								
8b	Methylmercury	22967926								
24 N	Mirex	2385855			0.001	X			0.001	X
94	Naphthalene	91203								
9	Nickel	7440020								
25 N	Nitrates	14797558								
95	Nitrobenzene	98953								
50	Nitrophenol 2-	88755								
51	Nitrophenol 4-	100027								
26 N	Nitrosamines	35576911								
28 N	Nitrosodibutylamine,N	924163								
29 N	Nitrosodiethylamine,N	55185								
96	N-Nitrosodimethylamine	62759								
98	N-Nitrosodiphenylamine	86306								
30 N	Nitrosopyrrolidine,N	930552								
97	N-Nitrosodi-n-Propylamine	621647								
32 N	Oxygen, Dissolved	7782447								
33 N	Parathion	56382	0.065	X	0.013	X				
119	Polychlorinated Biphenyls PCBs:	1336363	2 U	X	0.014 U	X	10 U	X	0.03 U	X
34 N	Pentachlorobenzene	608935								
53	Pentachlorophenol	87865	M				13		7.9	
99	Phenanthrene	85018								
54	Phenol	108952								
36 N	Phosphorus Elemental	7723140							0.1	
100	Pyrene	129000								
10	Selenium	7782492								
11	Silver	7440224								
40 N	Sulfide-Hydrogen Sulfide	7783064			2	X			2	X
43 N	Tetrachlorobenzene,1,2,4,5	95943								
37	Tetrachloroethane 1,1,2,2-	79345								
38	Tetrachloroethylene	127184								
12	Thallium	7440280								
39	Toluene	108883								
120	Toxaphene	8001352	0.73	X	0.0002	X	0.21	X	0.0002	X
40	Trans-Dichloroethylene 1,2-	156605								
44 N	Tributyltin (TBT)	688733								
101	Trichlorobenzene 1,2,4-	120821								
41	Trichloroethane 1,1,1-	71556								
42	Trichloroethane 1,1,2-	79005								
43	Trichloroethylene	79016								
45 N	Trichlorophenol 2,4,5	95954								
55	Trichlorophenol 2,4,6-	88062								
44	Vinyl Chloride	75014								

EPA No.	Compound	CAS Number	Freshwater				Saltwater			
			Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date
13	Zinc	7440666								

Footnotes for Tables 33A and 33B:

A Values in Table 20 are applicable to all basins.

C Ammonia criteria for freshwater may depend on pH, temperature, and the presence of salmonids or other fish with ammonia-sensitive early life stages. Values for freshwater criteria (of total ammonia nitrogen in mg N/L) can be calculated using the formulae specified in *1999 Update of Ambient Water Quality Criteria for Ammonia* (EPA-822-R-99-014; http://www.epa.gov/ost/standards/ammonia/99update.pdf):

Freshwater Acute:

salmonids present…CMC = $\frac{0.275}{1+10^{7.204-pH}}+\frac{39.0}{1+10^{pH-7.204}}$

salmonids not present…CMC= $\frac{0.411}{1+10^{7.204-pH}}+\frac{58.4}{1+10^{pH-7.204}}$

Freshwater Chronic:

fish early life stages present

$$CCC=\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)*MIN(2.85,1.45*10^{0.028*(25-T)})$$

fish early life stages not present

$$CCC=\left(\frac{0.0577}{1+10^{7.688-pH}}+\frac{2.487}{1+10^{pH-7.688}}\right)*1.45*10^{0.028*(25-MAX(T,7))}$$

Note: these chronic criteria formulae would be applied to calculate the 30-day average concentration limit; in addition, the highest 4-day average within the 30-day period should not exceed 2.5 times the CCC.

D Ammonia criteria for saltwater may depend on pH and temperature. Values for saltwater criteria (total ammonia) can be calculated from the tables specified in *Ambient Water Quality Criteria for Ammonia (Saltwater)--1989* (EPA 440/5-88-004; http://www.epa.gov/ost/pc/ambientwqc/ammoniasalt1989.pdf).

E Freshwater and saltwater criteria for metals are expressed in terms of "dissolved" concentrations in the water column, except where otherwise noted (e.g. aluminum).

F The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. Criteria values for hardness may be calculated from the following formulae (CMC refers to Acute Criteria; CCC refers to Chronic Criteria):

$$CMC = (\exp(m_A*[\ln(hardness)] + b_A))*CF$$

$$CCC = (\exp(m_C*[\ln(hardness)] + b_C))*CF$$

where CF is the conversion factor used for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column.

Chemical	m_A	b_A	m_C	b_C
Cadmium	1.0166	-3.924	0.7409	-4.719
Chromium III	0.8190	3.7256	0.8190	0.6848
Copper	0.9422	-1.700	0.8545	-1.702
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	2.255	0.8460	0.0584
Silver	1.72	-6.59		
Zinc	0.8473	0.884	0.8473	0.884

Conversion factors (CF) for dissolved metals (the values for total recoverable metals criteria were multiplied by the appropriate conversion factors shown below to calculate the dissolved metals criteria):

Chemical	Freshwater		Saltwater	
	Acute	Chronic	Acute	Chronic
Arsenic	1.000	1.000	1.000	1.000
Cadmium	1.136672-[(ln hardness)(0.041838)]	1.101672-[(ln hardness)(0.041838)]	0.994	0.994
Chromium III	0.316	0.860	--	--
Chromium VI	0.982	0.962	0.993	0.993
Copper	0.960	0.960	0.83	0.83
Lead	1.46203-[(ln hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]	0.951	0.951
Nickel	0.998	0.997	0.990	0.990
Selenium	0.996	0.922	0.998	0.998
Silver	0.85	0.85	0.85	--
Zinc	0.978	0.986	0.946	0.946

I This value is based on criterion published in Ambient Water Quality Criteria for Endosulfan (EPA 440/5-80-046) and should be applied as the sum of alpha- and beta-endosulfan.

M Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: CMC=(exp(1.005(pH)-4.869); CCC=exp(1.005(pH)-5.134).

N This number was assigned to the list of non-priority pollutants in National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047).

O This criterion is based on EPA recommendations issued in 1980 that were derived using guidelines that differed from EPA's 1985 Guidelines for minimum data requirements and derivation procedures. For example, a "CMC" derived using the 1980 Guidelines was derived to be used as an instantaneous maximum. If assessment is to be done using an averaging period, the values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.

P Criterion shown is the minimum (i.e. CCC in water should not be below this value in order to protect aquatic life).

Q Criterion is applied as total arsenic (i.e. arsenic (III) + arsenic (V)).

S This criterion is expressed as µg free cyanide (CN)/L.

T This criterion applies to DDT and its metabolites (i.e. the total concentration of DDT and its metabolites should not exceed this value).

U This criterion applies to total PCBs (e.g. the sum of all congener or all isomer or homolog or Arochlor analyses).

V The CMC=1/[(f1/CMC1)+(f2/CMC2)] where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 µg/L and 12.82 µg/L, respectively.

W The acute and chronic criteria for aluminum are 750 µg/L and 87 µg/L, respectively. These values for aluminum are expressed in terms of "total recoverable" concentration of metal in the water column. The criterion applies at pH<6.6 and hardness<12 mg/L (as $CaCO_3$).

X The effective date for the criterion in the column immediately to the left is 1991.

Y No criterion.

TABLE 33B

Note: The Environmental Quality Commission adopted the following criteria on May 20, 2004 to become effective on EPA approval. EPA has not yet (as of June 2006) approved these criteria. The Table 33B criteria may not be used until they are approved by EPA.

AQUATIC LIFE WATER QUALITY CRITERIA SUMMARY[A]

The concentration for each compound listed in Table 33A is a criterion not to be exceeded in waters of the state in order to protect aquatic life. All values are expressed as micrograms per liter (µg/L) except where noted. Compounds are listed in alphabetical order with the corresponding EPA number (from National Recommended Water Quality Criteria: 2002, EPA-822-R-02-047), the Chemical Abstract Service (CAS) number, aquatic life freshwater acute and chronic criteria, aquatic life saltwater acute and chronic criteria. The acute criteria refer to the average concentration for one (1) hour and the chronic criteria refer to the average concentration for 96 hours (4 days), and that these criteria should not be exceeded more than once every three (3) years.

EPA No.	Compound	CAS Number	Freshwater				Saltwater			
			Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date
2 N	Aluminum (pH 6.5 - 9.0)	7429905	W		W					
3 N	Ammonia	7664417	C		C					
2	Arsenic	7440382								
15	Asbestos	1332214								
19	Benzene	71432								
3	Beryllium	7440417								
105	BHC gamma- (Lindane)	58899								
4	Cadmium	7440439	E,F		E,F		40 E		8.8 E	
107	Chlordane	57749								
	CHLORINATED BENZENES									
26	Chloroform	67663								
67	ChloroisopropylEther Bis2-	108601								
15N	ChloromethylEther, Bis	542881								
5a	Chromium (III)		E,F		E,F					
5b	Chromium (VI)	18540299	16 E		11 E					
6	Copper	7440508	E,F		E,F		4.8 E		3.1 E	
108	DDT 4,4'-	50293								
	DIBUTYLPHTHALATE									
	DICHLOROBENZENES									
	DICHLOROBENZIDINE									
	DICHLOROETHYLENES									
	DICHLOROPROPENE									
111	Dieldrin	60571			0.056					
	DINITROTOLUENE									
	DIPHENYLHYDRAZINE									
115	Endrin	72208			0.036					
86	Fluoranthene	206440								
	HALOMETHANES									

EPA No.	Compound	CAS Number	Freshwater				Saltwater			
			Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date	Acute (CMC)	Effective Date	Chronic (CCC)	Effective Date
20 N	Iron	7439896								
7	Lead	7439921	E,F		E,F		210 E		8.1 E	
22 N	Manganese	7439965								
8a	Mercury	7439976								
	MONOCHLOROBENZENE									
9	Nickel	7440020	E,F		E,F		74 E		8.2 E	
53	Pentachlorophenol	87865			M					
54	Phenol	108952								
	POLYNUCLEAR AROMATIC HYRDOCARBONS									
10	Selenium	7782492	E,V		5 E		290 E		71 E	
11	Silver	7440224	E,F,P		0.10 E		1.9 E,P			
44 N	Tributyltin (TBT)	688733	0.46		0.063		0.37		0.01	
41	Trichloroethane 1,1,1-	71556								
55	Trichlorophenol 2,4,6-	88062								
13	Zinc	7440666	E,F		E,F		90 E		81 E	

Footnotes for Tables 33A and 33B:

A Values in Table 20 are applicable to all basins.

C Ammonia criteria for freshwater may depend on pH, temperature, and the presence of salmonids or other fish with ammonia-sensitive early life stages. Values for freshwater criteria (of total ammonia nitrogen in mg N/L) can be calculated using the formulae specified in *1999 Update of Ambient Water Quality Criteria for Ammonia* (EPA-822-R-99-014; http://www.epa.gov/ost/standards/ammonia/99update.pdf):

Freshwater Acute:

salmonids present…CMC = $\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}}$

salmonids not present…CMC= $\frac{0.411}{1+10^{7.204-pH}} + \frac{58.4}{1+10^{pH-7.204}}$

Freshwater Chronic:

fish early life stages present

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) * MIN(2.85, 1.45*10^{0.028*(25-T)})$$

fish early life stages not present

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}}\right) * 1.45*10^{0.028*(25-MAX(T,7))}$$

Note: these chronic criteria formulae would be applied to calculate the 30-day average concentration limit; in addition, the highest 4-day average within the 30-day period should not exceed 2.5 times the CCC.

D Ammonia criteria for saltwater may depend on pH and temperature. Values for saltwater criteria (total ammonia) can be calculated from the tables specified in *Ambient Water Quality Criteria for Ammonia (Saltwater) -1989* (EPA 440/5-88-004; http://www.epa.gov/ost/pc/ambientwqc/ammoniasalt1989.pdf).

E Freshwater and saltwater criteria for metals are expressed in terms of "dissolved" concentrations in the water column, except where otherwise noted (e.g. aluminum).

F The freshwater criterion for this metal is expressed as a function of hardness (mg/L) in the water column. Criteria values for hardness may be calculated from the following formulae (CMC refers to Acute Criteria; CCC refers to Chronic Criteria):

$CMC = (\exp(m_A*[\ln(\text{hardness})] + b_A))*CF$

$CCC = (\exp(m_C*[\ln(\text{hardness})] + b_C))*CF$

where CF is the conversion factor used for converting a metal criterion expressed as the total recoverable fraction in the water column to a criterion expressed as the dissolved fraction in the water column.

Chemical	m_A	b_A	m_C	b_C
Cadmium	1.0166	-3.924	0.7409	-4.719
Chromium III	0.8190	3.7256	0.8190	0.6848
Copper	0.9422	-1.700	0.8545	-1.702
Lead	1.273	-1.460	1.273	-4.705
Nickel	0.8460	2.255	0.8460	0.0584
Silver	1.72	-6.59		
Zinc	0.8473	0.884	0.8473	0.884

Conversion factors (CF) for dissolved metals (the values for total recoverable metals criteria were multiplied by the appropriate conversion factors shown below to calculate the dissolved metals criteria):

Chemical	Freshwater		Saltwater	
	Acute	Chronic	Acute	Chronic
Arsenic	1.000	1.000	1.000	1.000
Cadmium	1.136672-[(ln hardness)(0.041838)]	1.101672-[(ln hardness)(0.041838)]	0.994	0.994
Chromium III	0.316	0.860	--	--
Chromium VI	0.982	0.962	0.993	0.993
Copper	0.960	0.960	0.83	0.83
Lead	1.46203-[(ln hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]	0.951	0.951
Nickel	0.998	0.997	0.990	0.990
Selenium	0.996	0.922	0.998	0.998
Silver	0.85	0.85	0.85	--
Zinc	0.978	0.986	0.946	0.946

I This value is based on criterion published in Ambient Water Quality Criteria for Endosulfan (EPA-440/5-80-046) and should be applied as the sum of alpha- and beta-endosulfan.

M Freshwater aquatic life values for pentachlorophenol are expressed as a function of pH, and are calculated as follows: CMC=(exp(1.005(pH)-4.869); CCC=exp(1.005(pH)-5.134).

N This number was assigned to the list of non-priority pollutants in National Recommended Water Quality Criteria: 2002 (EPA-822-R-02-047).

O This criterion is based on EPA recommendations issued in 1980 that were derived using guidelines that differed from EPA's 1985 Guidelines for minimum data requirements and derivation procedures. For example, a "CMC" derived using the 1980 Guidelines was derived to be used as an instantaneous maximum. If assessment is to be done using an averaging period, the values given should be divided by 2 to obtain a value that is more comparable to a CMC derived using the 1985 Guidelines.

P Criterion shown is the minimum (i.e. CCC in water should not be below this value in order to protect aquatic life).

R Arsenic criterion refers to the inorganic form only.
S This criterion is expressed as µg free cyanide (CN)/L.
T This criterion applies to DDT and its metabolites (i.e. the total concentration of DDT and its metabolites should not exceed this value).
U This criterion applies to total PCBs (e.g. the sum of all congener or all isomer or homolog or Arochlor analyses).
V The CMC=1/[(f1/CMC1)+(f2/CMC2)] where f1 and f2 are the fractions of total selenium that are treated as selenite and selenate, respectively, and CMC1 and CMC2 are 185.9 µg/L and 12.82 µg/L, respectively.
W The acute and chronic criteria for aluminum are 750 µg/L and 87 µg/L, respectively. These values for aluminum are expressed in terms of "total recoverable" concentration of metal in the water column. The criterion applies at pH<6.6 and hardness<12 mg/L (as $CaCO_3$).
X The effective date for the criterion in the column immediately to the left is 1991.
Y No criterion.

Authorization Page

Generated on December 23, 2013 11:24AM

PERMANENT ADMINISTRATIVE RULES

Department of Environmental Quality	340
Agency and Division	Administrative Rules Chapter Number
Maggie Vandehey	maggie.vandehey@state.or.us
Rules Coordinator	Email Address
811 SW Sixth Ave., Portland, OR 97204-1390	503-229-6878
Address	Telephone
12/12/2013	
Adopted on	
04/18/2014	
Effective date	

RULE CAPTION

Corrections and Clarifications to Toxics Water Quality Standards

Not more than 15 words

RULEMAKING ACTION

ADOPT:

AMEND: 340-041-0033

REPEAL:

RENUMBER:

AMEND & RENUMBER:

Stat. Auth.:: ORS 468.020, 468B.030, 468B.035, 468B.048

Other Auth.::

Stats. Implemented:: ORS 468B.030, 468B.035, 468B.048

RULE SUMMARY

The EQC amended water quality standards rules for toxic substances to correct and clarify the standards. Revisions to water quality standards require EPA approval before the revisions become effective for Clean Water Act programs.

The rules include the following:

â€¢ Correct several toxic pollutant criteria that EPA recently disapproved and address other minor revisions to the Toxic Substances rule. EPA disapproved criteria for 11 pesticides based on potentially conflicting information in regards to how the frequency and duration components of these criteria are expressed. DEQ expects that clarifying this aspect of the criteria will lead to EPA approval of 36 pesticide criteria values associated with 11 pesticides.
â€¢ Correct an error in the expression of freshwater selenium criteria.
â€¢ Re-propose freshwater and saltwater arsenic criteria and chromium VI saltwater criteria that were inadvertently left off the criteria table during a 2007 rulemaking.
â€¢ Correct typographical errors made during the 2011 Human Health Toxics Rulemaking.
â€¢ Move all effective aquatic life criteria from Tables 20, 33A, and 33B into a new aquatic life criteria table, Table 30, and to refer to the new table in the Toxic Substances rule language. As a result, Tables 20, 33A, and 33B are no longer needed and would be repealed under this proposal.
â€¢ Delete aluminum from Table 30 to reflect EPA's disapproval of the freshwater criteria for aluminum because the disapproval renders the criteria ineffective and there are no other criteria for aluminum. DEQ anticipates adopting revised freshwater criteria for aluminum in a future rulemaking process.

Maggie Vandehey	Maggie Vandehey	12/23/2013
Authorized Signer	Printed Name	Date

Authorization Page replaces the ink signature on paper filings. Have your authorized signer sign and date, then scan and attach it to your filing. You must complete this step before submitting your Permanent and Temporary filings.

Secretary of State
Certificate and Order for Filing

PERMANENT ADMINISTRATIVE RULES

I certify that the attached copies are true, full and correct copies of the PERMANENT Rule(s) adopted on 12/12/2013 by the

Department of Environmental Quality — 340

Agency and Division — Administrative Rules Chapter Number

Maggie Vandehey — (503) 229-6878

Rules Coordinator — Telephone

811 SW Sixth Ave., Portland, OR 97204-1390

Address

To become effective 04/18/2014 Rulemaking Notice was published in the September 2013 Oregon Bulletin.

RULE CAPTION

Corrections and Clarifications to Toxics Water Quality Standards

Not more than 15 words that reasonably identifies the subject matter of the agency's intended action.

RULEMAKING ACTION

Secure approval of new rule numbers with the Administrative Rules Unit prior to filing.

ADOPT:

AMEND:
340-041-0033

REPEAL:

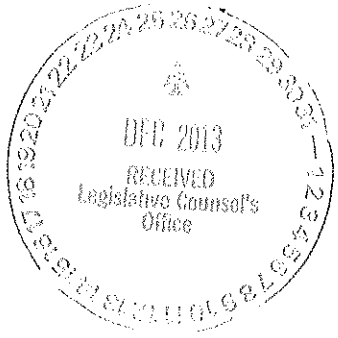
RENUMBER:

AMEND AND RENUMBER:

Statutory Authority:
ORS 468.020, 468B.030, 468B.035, 468B.048

Other Authority:

Statutes Implemented:
ORS 468B.030, 468B.035, 468B.048



RULE SUMMARY

The EQC amended water quality standards rules for toxic substances to correct and clarify the standards. Revisions to water quality standards require EPA approval before the revisions become effective for Clean Water Act programs.

The rules include the following:
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Ã¢â‚¬Â¢ Correct an error in the expression of freshwater selenium criteria.
Ã¢â‚¬Â¢ Re-propose freshwater and saltwater arsenic criteria and chromium VI saltwater criteria that were inadvertently left off the criteria table during a 2007 rulemaking.
Ã¢â‚¬Â¢ Correct typographical errors made during the 2011 Human Health Toxics Rulemaking.
Ã¢â‚¬Â¢ Move all effective aquatic life criteria from Tables 20, 33A, and 33B into a new aquatic life criteria table, Table 30, and to refer to the new table in the Toxic Substances rule language. As a result, Tables 20, 33A, and 33B are no longer needed and would be repealed under this proposal.
Ã¢â‚¬Â¢ Delete aluminum from Table 30 to reflect EPA's disapproval of the freshwater criteria for aluminum because the disapproval renders the criteria ineffective and there are no other criteria for aluminum. DEQ anticipates adopting revised freshwater criteria for aluminum in a future rulemaking process.

Maggie Vandehey	maggie.vandehey@state.or.us
Rules Coordinator Name	Email Address

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Department of Environmental Quality Portland
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Salem, OR 97301
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Special Instructions:

Toxics WQ Standards Effective 4.18.2014

Shuttled 12/24/2013

Oregon
John A. Kitzhaber, MD, Governor

Department of Environmental Quality
Headquarters
811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696
FAX (503) 229-6124
TTY 711

January 9, 2014

Daniel D. Opalski, Director
Office of Water and Watersheds
U.S. Environmental Protection Agency, Region 10
1200 Sixth Avenue Mail Code: OWW-135
Seattle, Washington 98101

RE: Oregon Submission of Revised State Water Quality Standards for Toxic Pollutants

Dear Mr. Opalski:

The Oregon Department of Environmental Quality is pleased to submit revisions to its state water quality standards adopted by the Oregon Environmental Quality Commission (EQC) on Dec. 12, 2013. The EQC adopted revisions to the Toxics Substances Rule in Division 41 and corrected minor reference errors to the Groundwater Rules in Division 40 of the Oregon Administrative Rules (OAR) Chapter 340. In accordance with 33 USC 1313(c) of the Clean Water Act, DEQ is seeking EPA's review and action on the submitted rule revisions. The adopted rule revisions and the associated water quality toxics criteria tables are attached to the Oregon Attorney General's certification letter, shown in underline/strikeout format.

The adopted revisions to Oregon's Toxics Substances Rule address EPA's Jan. 31, 2013 disapproval of aquatic life criteria for 36 criteria associated with eleven pesticides and two freshwater criteria associated with selenium. DEQ added a sentence to the introductory paragraph in Table 30 to make it clearer that the pesticides associated with Footnote A have an alternate frequency and duration than the other toxic pollutants. This lack of clarity was the basis for EPA's disapproval. DEQ also corrected the freshwater selenium criteria by multiplying the criteria magnitude by the appropriate conversion factors to express the criteria as dissolved. As part of the 2004 rulemaking, DEQ mistakenly left off these conversion factors. DEQ anticipates that both of these revisions will address EPA's disapproval of the pesticide and selenium criteria.

The revised rules do not address EPA's disapproval of aquatic life freshwater criteria for aluminum, ammonia, cadmium (acute only), and copper. DEQ anticipates reviewing ammonia and copper criteria this year. Given EPA's current literature and toxicity review of aluminum and cadmium criteria, DEQ does not intend to evaluate revisions to state criteria until EPA finalizes their criteria recommendations.

In addition to addressing EPA's disapproval of pesticide and selenium criteria, DEQ also adopted the following revisions:

- Re-proposed freshwater and saltwater arsenic criteria and chromium VI saltwater criteria that were inadvertently left off the criteria table during a 2007 rulemaking.

These criteria already underwent Endangered Species Act consultation by the U.S. Fish and Wildlife Service and the National Marine Fisheries Service and were not found to create jeopardy for any ESA-listed species. Therefore, DEQ expects prompt EPA approval.

- Deleted aluminum from Table 30. EPA's disapproval of the freshwater criteria for aluminum renders the criteria ineffective and there are no other EPA approved criteria for aluminum. DEQ anticipates evaluating revised freshwater criteria for aluminum in a future rulemaking process as discussed above.
- Moved all aquatic life criteria from Tables 20, 33A and 33B into a new aquatic life criteria table—Table 30. Therefore, rule revisions in the Toxics Substances, Bacteria and Groundwater Rules now refer to Table 30 or the Toxic Substances Rule in general. Consequently, DEQ repealed Tables 20, 33A and 33B because they are no longer needed. In addition, DEQ made several footnote clarifications in Table 30.
- Revised Table 33C, which contains water quality guidance values for toxic pollutants, and Table 40, which contains human health toxics criteria, to be consistent with agency table formatting guidelines. Other revisions renamed Table 33C as Table 31 and removed the arsenic guidance values. These values are unnecessary because Oregon already has aquatic life criteria for arsenic.
- Corrected typographical and reference errors made during the 2011 Human Health Toxics Rulemaking.

For more information about these revisions, please see the enclosed staff report. The staff report also includes a summary and response to public comment. Additional information related to the advisory committee, including materials and minutes may be found on DEQ's website: http://www.deq.state.or.us/wq/standards/StandardsClarification.htm.

The rule amendments associated with OAR-340-041-0009 (Bacteria Rule), OAR-340-040-0020 (Groundwater Quality Protection) and OAR-340-040-0080 (Numerical Groundwater Quality Reference Levels and Guidance Levels) became effective under State law upon filing with the Oregon Secretary of State on Dec. 23, 2013. The revisions made to these rules are not water quality standard revisions and are therefore being forwarded to EPA for informational purposes only.

OAR-340-041-0033 states that revisions to the Toxics Substances Rule do not become effective until April 18, 2014, and are not applicable for purposes of the CWA until they are approved by EPA. DEQ selected this date in consultation with EPA staff. If EPA finds they cannot take action on Oregon's adopted rules by that date, please notify us at your earliest convenience. In that event, DEQ would likely extend the effective date by temporary rule.

An Attorney General's certification of rule adoption, the Secretary of State Certificate of Filing, clean and redline versions of the adopted rules, and the EQC staff report are enclosed. Note that DEQ separated these documents by effective date of rule revisions. DEQ will forward the EQC meeting minutes when they have been approved by the EQC, expected to occur by Jan. 13.

DEQ would like to take this opportunity to thank EPA staff member Kathleen Collins for her input and participation on this rulemaking. We hope to continue this partnership with EPA as we look towards upcoming rulemakings for ammonia and copper.

If you have questions regarding this submittal or would like additional information, please contact me or have your staff contact Andrea Matzke, Water Quality Standards Specialist, at 503-299-5384.

Sincerely,

Gregory K. Aldrich
Water Quality Division Administrator

Cc: Angela Chung, EPA
Kathleen Collins, EPA
Jennifer Wigal, DEQ
Debra Sturdevant, DEQ
Andrea Matzke, DEQ
Larry Knudsen, DOJ

Enclosures:
OAR Rules Chapter 340-041-0033, 340-041-0009, 340-040-0020, 340-040-0080 and associated toxics criteria tables
DOJ Certification of Rule Adoption
Copy of Secretary of State Certificate of Filing
Staff Report to the Commission (Dec. 12, 2013)

Gov Delivery

On Dec. 12, the Oregon Environmental Quality Commission adopted revisions to the state's toxics water quality standards. The amendments address EPA's Jan. 31, 2013 disapproval of several aquatic life toxics criteria, specifically criteria associated with 11 pesticides and selenium. The rulemaking also reinstates criteria for arsenic and chromium VI which had been omitted from the table in error during an earlier rulemaking. In addition, DEQ consolidated all the effective aquatic life toxics criteria into one new table (Table 30). Following EPA approval, the amendments would become applicable on April 18, 2014.

For more details on the revisions, please see DEQ's "Corrections and Clarifications to Toxics Water Quality Standards Rulemaking" web page at:
http://www.deq.state.or.us/wq/standards/StandardsClarification.htm.

For general information on water quality standards for toxic pollutants, see the following website:
http://www.deq.state.or.us/wq/standards/toxics.htm; or contact:

Andrea Matzke at 503-229-5384 or matzke.andrea@deq.state.or.us
or
Debra Sturdevant at 503-229-6691 or sturdevant.debra@deq.state.or.us

Email to WQ Staff

Hi All,

I wanted to let you know that last week, the Oregon Environmental Quality Commission adopted revisions to toxics water quality standards. The amendments address EPA's Jan. 31, 2013 disapproval of several aquatic life toxics criteria, specifically 36 criteria associated with 11 pesticides, and two freshwater criteria associated with selenium. The rulemaking also reinstates freshwater and saltwater criteria for arsenic and saltwater criteria for chromium VI which were inadvertently left off of Table 33B during a 2007 rulemaking. In addition, the revisions include clarifications and minor corrections from past rulemakings. Lastly, DEQ consolidated all the effective aquatic life toxics criteria into one new table (Table 30). **Following EPA approval, the amendments would become applicable on April 18, 2014.** I will notify DEQ staff and post the new Table 30 on the toxics water quality standards website at that time.

Generally, you will not notice substantive changes in Table 30 from the toxics tables that are currently effective based on EPA's January approval and disapproval actions. The pesticides were disapproved based on an unclear reading of the frequency and duration components of most of the pesticide criteria. We've added a sentence in the introductory paragraph to Table 30 to make this clearer, but the criteria didn't change. Three additional pesticides—alpha endosulfan, beta endosulfan, and heptachlor epoxide—will also become applicable in April. These pesticides had been adopted by the EQC in 2004. Like most of the other metals, selenium, arsenic, and chromium VI criteria will be expressed as dissolved. Table 20 criteria (now residing in Table 30) for freshwater copper, ammonia, aluminum, and cadmium (acute only)—pollutants also disapproved by EPA—will continue to be effective until the EQC adopts and EPA approves revised criteria.

For more details on these revisions, please see DEQ's "Corrections and Clarifications to Toxics Water Quality Standards Rulemaking" web page at: http://www.deq.state.or.us/wq/standards/StandardsClarification.htm. You will find the Staff Report as well as the Adopted Rules. There is a clean copy of new Table 30 in the Adopted Rules document that you can refer to. If you have any specific questions, please feel free to contact me.

This is probably a good time to let you know that I'll be putting a webinar together in January that will provide an opportunity for DEQ staff to learn more about upcoming rulemakings for copper and ammonia. Be on the lookout for a *Save the Date* email from me about this.

Thanks!

ELLEN F. ROSENBLUM
Attorney General

FREDERICK M. BOSS
Deputy Attorney General

DEPARTMENT OF JUSTICE
GENERAL COUNSEL DIVISION

January 3, 2014

Daniel Opalski
EPA Region 10
1200 Sixth Avenue
Seattle, Washington 98101

Re: Certification of Water Quality Standards Amendment (Toxics Corrections and Clarifications Filed on 12-23-2013)

Dear Mr. Opalski:

On December 12, 2013, the Oregon Environmental Quality Commission adopted an amendment to OAR 340-041-0033, Oregon's rule establishing general water quality standards for toxics. The rule amendment addresses criteria that had been previously disapproved by EPA and makes a number of other "housekeeping" type revisions to the rule. The amendment revises provisions relating to pesticides, selenium, arsenic, and chromium. The rule revisions move aquatic life criteria to a new table, designated as Table 30, and delete the previous tables 20, 33A, and 33B. The rule revisions also repeal the criteria for aluminum, which were previously disapproved by EPA. The specific revisions to OAR 340-041-0033 are set out in attachment A to this letter.

I certify that this rule amendment was adopted by the Commission, conforms to state law, and was lawfully adopted under the applicable provisions of Oregon's laws governing administrative procedure, ORS 183.310 to 183.725, and the Commission's own procedures for rulemaking in OAR chapter 340, division 11. The amendments were filed with Secretary of State on December 23, 2013. The rule amendment included a provision specifying that these amendments become effective on April 18, 2014.

In addition, the Commission adopted certain amendments to the rules in Oregon Administrative Rules chapter 340, divisions 40 and 41 to correct and clarify references to Oregon's toxics rule. Specifically, the Commission amended OAR 340-040-0020 (groundwater quality protection), OAR 340-040-0080 (numeric groundwater quality reference and guidance levels), and OAR 340-041-0009 (the bacteria rule) to remove the reference to Table 20. The amendments to OAR 340-040-0020 also remove an outdated cross reference to Oregon's anti-degradation policy. These rule amendments are shown in Attachment B, to this letter.

I certify that these rule amendments were adopted by the Commission, conform to state law, and were lawfully adopted under the applicable provisions of Oregon's laws governing

administrative procedure, ORS 183.310 to 183.725, and the Commission's own procedures for rulemaking, OAR chapter 340, division 11. These amendments were filed with Secretary of State on December 23, 2013, and became effective on that date.

Sincerely,

Larry Knudsen
Assistant Attorney General
Natural Resources Section

Attachments A and B

LJK:lal/JUSTICE-#4888323-v1

cc: Greg Aldrich, DEQ
Debra Sturdevant, DEQ
Andrea Matzke, DEQ