**Note:** Proposed changes associated with Table 40 (red-underlined font): (1) Corrected several typos for arsenic criteria; (2) Corrected bis 2 Chloroethyl Ether to reflect two significant digits to be consistent with the other human health criteria; (3) Corrected selenium typo; (4) Corrected nickel typo; (5) Corrected trichloroethane 1,1,2 typo; (6) Corrected zinc typo and; (6) Bolded and increased the font size of the footnote letters.

**TABLE 40: Human Health Water Quality Criteria for Toxic Pollutants**

*Effective 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).

| **No.** | **Pollutant** | **CAS No.** | **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” criteria 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***Thehuman 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 |
| 25 | Chloroethyl Ether bis 2 | 111444 | y | n | 0.020 | 0.050  [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***TheChlorophenoxy 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 |
| 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 |
| 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 |
| 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 |
|  |  |  |  |  |  |  |