

**APPROVED REGULATION OF THE
STATE ENVIRONMENTAL COMMISSION**

LCB File No. R043-19

Filed December 30, 2019

EXPLANATION – Matter in *italics* is new; matter in brackets [~~omitted material~~] is material to be omitted.

AUTHORITY: §§1-4, NRS 445A.425 and 445A.520.

A REGULATION relating to water quality standards; revising the water quality standards for selenium for the support of aquatic life; and providing other matters properly relating thereto.

Legislative Counsel's Digest:

Existing law requires the State Environmental Commission to adopt regulations to establish standards of water quality. (NRS 445A.425) Under existing law, the Commission must base its water quality standards on water quality criteria which numerically or descriptively define the conditions necessary to maintain the designated beneficial use or uses of the water. Further, the water quality standards must reflect water quality criteria which define the conditions necessary to support, protect and allow the propagation of fish, shellfish and other wildlife if these objectives are reasonably attainable. (NRS 445A.520)

Under existing regulations the water quality standards for selenium for the protection of aquatic life are 20 micrograms per liter for the 1-hour average and 5 micrograms per liter for the 96-hour average. (NAC 445A.1236) **Section 1** of this regulation revises those water quality standards for all bodies of water except the Las Vegas Wash. Specifically, **section 1** provides, with limited exception, that the 30-day average for flowing waters is not to exceed 3.9 micrograms per liter more than once every 3 years and the 30-day average for still waters is not to exceed 1.9 micrograms per liter more than once every 3 years. The criterion value for intermittent exposure of selenium in water is a calculated value which, with limited exception, may not be exceeded more than once every 3 years.

Section 1 also provides that samples of fish tissue, if available, shall take precedent over water column data. The standards for selenium in fish tissue as provided in this regulation are based on the type of sample used. **Section 1** provides, with limited exception, selenium levels in: (a) fish egg or ovary tissue must not exceed 19 milligrams per kilogram of dry weight; (b) whole

body tissue of fish must not exceed 9.5 milligrams per kilogram of dry weight; and (c) muscle tissue of fish must not exceed 13.1 milligrams per kilogram of dry weight.

Sections 2 and 4 of this regulation provide that the Las Vegas Wash will be subject to the revised water quality standards for selenium described above beginning on January 1, 2023.

Section 3 of this regulation makes a conforming change.

Section 1. Chapter 445A of NAC is hereby amended by adding thereto a new section to read as follows:

NEW FIRST
PARALLEL
SECTION

1. *Except as otherwise provided in subsection 8, the standards for selenium prescribed in this section for the support of aquatic life are applicable to the waters specified in NAC 445A.123 to 445A.2234, inclusive. The criterion values for selenium are calculated to reflect the lack of sturgeon or related fish species in the waters of this State and maintain the conditions necessary to support, protect and allow the propagation of fish species found in the waters of this State. See references a and b.*
2. *If the standards for selenium are exceeded at a site, the Commission will review and may adjust the standards for the site if:*
 - (a) *The standards are not economically controllable; or*
 - (b) *Site-specific values for fish and water have been derived through a technically defensible study (see references a and b) and results have been approved by the Division.*
3. *If data from fish tissue are available, such data shall take precedence over data obtained from a water sample. If data from fish egg or ovary tissue are available, such data shall take precedence over data from whole body tissue or fish muscle tissue.*
4. *Any sampling of fish tissue must be performed in accordance with EPA protocols. See references a and b.*

5. Any person or entity wishing to develop site-specific values for fish tissue and water shall submit a proposed sampling and analysis plan to the Division. The plan must be approved by the Division before the study to derive site-specific values for fish tissue and water is conducted.

6. Except as provided in subsections 2 and 8, the criterion values for selenium in fish tissue are instantaneous values that may not be exceeded. The criterion values for selenium in fish tissue are:

| <i>Type of Tissue Analyzed</i> | <i>Criterion Value (mg/kg dry weight)</i> |
|---------------------------------|---|
| <i>Fish Egg or Ovary Tissue</i> | <i>19</i> |
| <i>Fish Whole Body Tissue</i> | <i>9.5</i> |
| <i>Fish Muscle Tissue</i> | <i>13.1</i> |

7. Except as provided in subsections 2 and 8, the criterion values for dissolved selenium in the water column for aquatic life is:

| <i>Exposure Duration and Category of Water</i> | <i>Criterion Value (µg/L)</i> |
|--|--|
| <i>30-day average, lentic water</i> | <i>1.9</i> |
| <i>30-day average, lotic water</i> | <i>3.9</i> |
| <i>Intermittent, lentic water</i> | <i>1.9 - C_{bkgd}(1 - f_{int})/f_{int}</i> |
| <i>Intermittent, lotic water</i> | <i>3.9 - C_{bkgd}(1 - f_{int})/f_{int}</i> |

↪ *The 30-day average and intermittent concentration limits for selenium may be exceeded only once every 3 years. See reference a.*

8. The criterion values for selenium in the water column for the protection of aquatic life for the bodies of water known as the Las Vegas Wash, as described in NAC 445A.2156 and 445A.2158, are 20 micrograms per liter for the one-hour average and 5 micrograms per liter for the 96-hour average. The one-hour average and 96-hour average concentration limits may be exceeded only once every 3 years. See references c and d. Data from fish tissue may not be used to substantiate selenium levels for the bodies of water described in this subsection.

9. Nothing in this section authorizes a person to take fish without complying with applicable provisions of law related to fishing in this State.

10. As used in this section:

(a) "C_{bkgd}" means the average daily ambient concentration integrated over 30 days.

(b) "f_{int}" means the fraction of any 30-day period during which there are elevated concentrations of selenium.

(c) "Fish muscle tissue" means tissue collected from a skinless and boneless fillet.

(d) “Lentic water” means a standing body of water such as a lake or reservoir.

(e) “Lotic water” means a flowing or moving body of water such as a stream or river.

References:

a. U.S. Environmental Protection Agency, Pub. No. EPA 822-R-16-006, Aquatic Life Ambient Water Quality Criterion for Selenium - Freshwater, June 2016.

b. U.S. Environmental Protection Agency, Pub. No. EPA 820-F-16-007, Technical Support for Fish Tissue Monitoring for Implementation of EPA’s 2016 Selenium Criterion (Draft), September 2016.

c. U.S. Environmental Protection Agency, Pub. No. EPA 440/5-86-001, Quality Criteria for Water (Gold Book) (1986).

d. U.S. Environmental Protection Agency, National Recommended Water Quality Criteria, May 2009.

NEW
SECOND
PARALLEL
SECTION

Sec. 2. Section 1 of this regulation is hereby amended to read as follows:

1. ~~{Except as otherwise provided in subsection 8, the}~~ *The* standards for selenium prescribed in this section for the support of aquatic life are applicable to the waters specified in NAC 445A.123 to 445A.2234, inclusive. The criterion values for selenium are calculated to reflect the lack of sturgeon or related fish species in the waters of this State and maintain the conditions necessary to support, protect and allow the propagation of fish species found in the waters of this State. See references a and b.

2. If the standards for selenium are exceeded at a site, the Commission will review and may adjust the standards for the site if:

(a) The standards are not economically controllable; or

(b) Site-specific values for fish and water have been derived through a technically defensible study (see references a and b) and results have been approved by the Division.

3. If data from fish tissue are available, such data shall take precedence over data obtained from a water sample. If data from fish egg or ovary tissue are available, such data shall take precedence over data from whole body tissue or fish muscle tissue.

4. Any sampling of fish tissue must be performed in accordance with EPA protocols. See references a and b.

5. Any person or entity wishing to develop site-specific values for fish tissue and water shall submit a proposed sampling and analysis plan to the Division. The plan must be approved by the Division before the study to derive site-specific values for fish tissue and water is conducted.

6. Except as provided in ~~subsections 2 and 8,~~ *subsection 2*, the criterion values for selenium in fish tissue are instantaneous values that may not be exceeded. The criterion values for selenium in fish tissue are:

| Type of Tissue Analyzed | Criterion Value (mg/kg dry weight) |
|--------------------------|---------------------------------------|
| Fish Egg or Ovary Tissue | 19 |
| Fish Whole Body Tissue | 9.5 |
| Fish Muscle Tissue | 13.1 |

7. Except as provided in ~~subsections 2 and 8,~~ *subsection 2*, the criterion values for dissolved selenium in the water column for aquatic life is:

| Exposure Duration and Category of Water | Criterion Value (µg/L) |
|---|---------------------------------------|
| 30-day average, lentic water | 1.9 |
| 30-day average, lotic water | 3.9 |
| Intermittent, lentic water | $1.9 - C_{bkgd}(1 - f_{int})/f_{int}$ |
| Intermittent, lotic water | $3.9 - C_{bkgd}(1 - f_{int})/f_{int}$ |

↳ The 30-day average and intermittent concentration limits for selenium may be exceeded only once every 3 years. See reference a.

~~8. [The criterion values for selenium in the water column for the protection of aquatic life for the bodies of water known as the Las Vegas Wash, as described in NAC 445A.2156 and 445A.2158, are 20 micrograms per liter for the one-hour average and 5 micrograms per liter for the 96-hour average. The One-hour average and 96-hour average concentration limits may be exceeded only once every 3 years. See references c and d. Data from fish tissue may not be used to substantiate selenium levels for the bodies of water described in this subsection.~~

~~—9.]~~ Nothing in this section authorizes a person to take fish without complying with applicable provisions of law related to fishing in this State.

~~{10.}~~ 9. As used in this section:

(a) “C_{bkgd}” means the average daily ambient concentration integrated over 30 days.

(b) “f_{int}” means the fraction of any 30-day period during which there are elevated concentrations of selenium.

(c) “Fish muscle tissue” means tissue collected from a skinless and boneless fillet.

(d) “Lentic water” means a standing body of water such as a lake or reservoir.

(e) “Lotic water” means a flowing or moving body of water such as a stream or river.

References:

a. U.S. Environmental Protection Agency, Pub. No. EPA 822-R-16-006, *Aquatic Life Ambient Water Quality Criterion for Selenium - Freshwater*, June 2016.

b. U.S. Environmental Protection Agency, Pub. No. EPA 820-F-16-007, *Technical Support for Fish Tissue Monitoring for Implementation of EPA’s 2016 Selenium Criterion (Draft)*, September 2016.

~~c. U.S. Environmental Protection Agency, Pub. No. EPA 440/5-86-001, *Quality Criteria for Water (Gold Book) (1986)*.~~

~~d. U.S. Environmental Protection Agency, *National Recommended Water Quality Criteria, May 2009*.~~

Sec. 3. NAC 445A.1236 is hereby amended to read as follows:

445A.1236 1. Except for waters which have site-specific standards for toxic materials or as otherwise provided in this section, the standards for toxic materials prescribed in subsection 2 are applicable to the waters specified in NAC 445A.123 to 445A.2234, ~~inclusive~~ **inclusive**, **and section 1 of this regulation**. The following criteria apply to this section:

(a) If the standards are exceeded at a site and are not economically controllable, the Commission will review and may adjust the standards for the site.

(b) If a standard does not exist for each designated beneficial use, a person who plans to discharge waste must demonstrate that no adverse effect will occur to a designated beneficial use. If the discharge of a substance will lower the quality of the water, a person who plans to discharge waste must meet the requirements of NRS 445A.565.

(c) If a criterion is less than the detection limit of a method that is acceptable to the Division, laboratory results which show that the substance was not detected shall be deemed to show compliance with the standard unless other information indicates that the substance may be present.

2. The standards for toxic materials are:

| Chemical | Municipal or Domestic Supply (µg/L) | Aquatic Life ^(1,2) (µg/L) | Irrigation (µg/L) | Watering of Livestock (µg/L) |
|--|--|---|----------------------|---------------------------------|
| INORGANIC CHEMICALS⁽³⁾ | | | | |
| Antimony | 146 ^a | - | - | - |
| Arsenic | 50 ^b | - | 100 ^c | 200 ^d |
| 1-hour average | - | 340 ^{f(4)} | - | - |
| 96-hour average | - | 150 ^{f(4)} | - | - |
| Barium | 2,000 ^b | - | - | - |
| Beryllium | 0 ^a | - | 100 ^c | - |
| Boron | - | - | 750 ^a | 5,000 ^d |
| Cadmium | 5 ^b | - | 10 ^d | 50 ^d |
| 1-hour average | - | $(1.136672 - \{\ln(\text{hardness})(0.041838)\}) * e^{(1.0166\{\ln(\text{hardness})\} - 3.924) f(4)}$ | - | - |
| 96-hour average | - | $(1.101672 - \{\ln(\text{hardness})(0.041838)\}) * e^{(0.7409\{\ln(\text{hardness})\} - 4.719) f(4)}$ | - | - |
| Chromium (total) | 100 ^b | - | 100 ^d | 1,000 ^d |
| Chromium (VI) | - | - | - | - |
| 1-hour average | - | 16 ^{f(4)} | - | - |
| 96-hour average | - | 11 ^{f(4)} | - | - |
| Chromium (III) | - | - | - | - |
| 1-hour average | - | $(0.316) * e^{(0.8190\{\ln(\text{hardness})\} + 3.7256) f(4)}$ | - | - |
| 96-hour average | - | $(0.860) * e^{(0.8190\{\ln(\text{hardness})\} + 0.6848) f(4)}$ | - | - |

| Chemical | Municipal or Domestic Supply (µg/L) | Aquatic Life ^(1,2) (µg/L) | Irrigation (µg/L) | Watering of Livestock (µg/L) |
|--|--|---|----------------------|---------------------------------|
| Copper | - | - | 200 ^d | 500 ^d |
| 1-hour average | - | (0.960) * e ^{(0.9422{ln(hardness)} - 1.700) f,(4)} | - | - |
| 96-hour average | - | (0.960) * e ^{(0.8545{ln(hardness)} - 1.702) f,(4)} | - | - |
| Cyanide | 200 ^a | - | - | - |
| 1-hour average | - | 22 ^{f,(5)} | - | - |
| 96-hour average | - | 5.2 ^{f,(5)} | - | - |
| Fluoride | - | - | 1,000 ^d | 2,000 ^d |
| Iron | - | - | 5,000 ^d | - |
| 96-hour average | - | 1,000 ^f | - | - |
| Lead | 50 ^{a,b} | - | 5,000 ^d | 100 ^d |
| 1-hour average | - | (1.46203 - {ln(hardness)(0.145712)}) * e ^{(1.273{ln(hardness)} - 1.460) f,(4)} | - | - |
| 96-hour average | - | (1.46203 - {ln(hardness)(0.145712)}) * e ^{(1.273{ln(hardness)} - 4.705) f,(4)} | - | - |
| Manganese | - | - | 200 ^d | - |
| Mercury | 2 ^b | - | - | 10 ^d |
| 1-hour average | - | 1.4 ^{f,(4)} | - | - |
| 96-hour average | - | 0.77 ^{f,(4)} | - | - |
| Molybdenum | - | - | - | - |
| 1-hour average | - | 6,160 ^b | - | - |
| 96-hour average | - | 1,650 ^b | - | - |
| Nickel | 13.4 ^a | - | 200 ^d | - |
| 1-hour average | - | (0.998) * e ^{(0.8460{ln(hardness)} + 2.255) f,(4)} | - | - |
| 96-hour average | - | (0.997) * e ^{(0.8460{ln(hardness)} + 0.0584) f,(4)} | - | - |
| Selenium | 50 ^b | See section 1 of this regulation | 20 ^d | 50 ^d |
| 1-hour average | - | 20a | - | - |
| 96-hour average | - | 5.0f | - | - |
| Silver | - | - | - | - |
| 1-hour average | - | (0.85) * e ^{(1.72{ln(hardness)} - 6.59) f,(4)} | - | - |
| Sulfide (undissociated hydrogen sulfide) | - | - | - | - |
| 96-hour average | - | 2.0 ^f | - | - |
| Thallium | 13 ^a | - | - | - |
| Zinc | - | - | 2,000 ^d | 25,000 ^d |
| 1-hour average | - | (0.978) * e ^{(0.8473{ln(hardness)} + 0.884) f,(4)} | - | - |
| 96-hour average | - | (0.986) * e ^{(0.8473{ln(hardness)} + 0.884) f,(4)} | - | - |
| ORGANIC CHEMICALS | | | | |
| Acrolein | 320 ^a | - | - | - |
| 1-hour average | - | 3 ^f | - | - |
| 96-hour average | - | 3 ^f | - | - |
| Aldrin | 0 ^a | - | - | - |
| 1-hour average | - | 3.0 ^f | - | - |
| alpha-Endosulfan | - | - | - | - |
| 1-hour average | - | 0.22 ^f | - | - |
| 96-hour average | - | 0.056 ^f | - | - |
| beta-Endosulfan | - | - | - | - |
| 1-hour average | - | 0.22 ^f | - | - |
| 96-hour average | - | 0.056 ^f | - | - |
| Benzene | 5 ^b | - | - | - |
| Bis (2-chloroisopropyl) ether | 34.7 ^a | - | - | - |
| Chlordane | 0 ^a | - | - | - |
| 1-hour average | - | 2.4 ^f | - | - |

| Chemical | Municipal or Domestic Supply (µg/L) | Aquatic Life ^(1,2) (µg/L) | Irrigation (µg/L) | Watering of Livestock (µg/L) |
|--|---|---|----------------------|------------------------------------|
| 96-hour average | - | 0.0043 ^f | - | - |
| Chloroethylene (vinyl chloride) | 2 ^b | - | - | - |
| Chlorpyrifos | - | - | - | - |
| 1-hour average | - | 0.083 ^f | - | - |
| 96-hour average | - | 0.041 ^f | - | - |
| 2,4-D | 100 ^{a,b} | - | - | - |
| DDT & metabolites | 0 ^a | - | - | - |
| 4,4'-DDT | - | - | - | - |
| 1-hour average | - | 1.1 ^{f(6)} | - | - |
| 96-hour average | - | 0.001 ^{f(6)} | - | - |
| Demeton | - | - | - | - |
| 96-hour average | - | 0.1 ^f | - | - |
| Diazinon | - | - | - | - |
| 1-hour average | - | 0.17 ^f | - | - |
| 96-hour average | - | 0.17 ^f | - | - |
| Dibutyl phthalate | 34,000 ^a | - | - | - |
| m-dichlorobenzene | 400 ^a | - | - | - |
| o-dichlorobenzene | 400 ^a | - | - | - |
| p-dichlorobenzene | 75 ^b | - | - | - |
| 1,2-dichloroethane | 5 ^b | - | - | - |
| 1,1-dichloroethylene | 7 ^b | - | - | - |
| 2,4-dichlorophenol | 3,090 ^a | - | - | - |
| Dichloropropenes | 87 ^a | - | - | - |
| Dieldrin | 0 ^a | - | - | - |
| 1-hour average | - | 0.24 ^f | - | - |
| 96-hour average | - | 0.056 ^f | - | - |
| Di-2-ethylhexyl phthalate | 15,000 ^a | - | - | - |
| Diethyl phthalate | 350,000 ^a | - | - | - |
| Dimethyl phthalate | 313,000 ^a | - | - | - |
| 4,6-dinitro-2-methylphenol | 13.4 ^a | - | - | - |
| Dinitrophenols | 70 ^a | - | - | - |
| Endosulfan | 75 ^a | - | - | - |
| Endrin | 0.2 ^b | - | - | - |
| 1-hour average | - | 0.086 ^f | - | - |
| 96-hour average | - | 0.036 ^f | - | - |
| Ethylbenzene | 1,400 ^a | - | - | - |
| Fluoranthene (polynuclear aromatic hydrocarbon) | 42 ^a | - | - | - |
| Guthion | - | - | - | - |
| 96-hour average | - | 0.01 ^f | - | - |
| Heptachlor | - | - | - | - |
| 1-hour average | - | 0.52 ^f | - | - |
| 96-hour average | - | 0.0038 ^f | - | - |
| Heptacholor Epoxide | - | - | - | - |
| 1-hour average | - | 0.52 ^f | - | - |
| 96-hour average | - | 0.0038 ^f | - | - |
| Hexachlorocyclopentadiene | 206 ^a | - | - | - |
| Isophorone | 5,200 ^a | - | - | - |
| Lindane | 4 ^b | - | - | - |
| 1-hour average | - | 0.95 ^f | - | - |
| Malathion | - | - | - | - |
| 96-hour average | - | 0.1 ^f | - | - |
| Methoxychlor | 100 ^{a,b} | - | - | - |

| Chemical | Municipal or Domestic Supply (µg/L) | Aquatic Life ^(1,2) (µg/L) | Irrigation (µg/L) | Watering of Livestock (µg/L) |
|--|---|---|----------------------|------------------------------------|
| 96-hour average | - | 0.03 ^f | - | - |
| Mirex | 0 ^a | - | - | - |
| 96-hour average | - | 0.001 ^f | - | - |
| Monochlorobenzene | 488 ^a | - | - | - |
| Nitrobenzene | 19,800 ^a | - | - | - |
| Nonylphenol | - | - | - | - |
| 1-hour average | - | 28 ^f | - | - |
| 96-hour average | - | 6.6 ^f | - | - |
| Parathion | - | - | - | - |
| 1-hour average | - | 0.065 ^a | - | - |
| 96-hour average | - | 0.013 ^a | - | - |
| Pentachlorophenol | 1,010 ^a | - | - | - |
| 1-hour average | - | e ^{1.005(pH) - 4.869f} | - | - |
| 96-hour average | - | e ^{1.005(pH) - 5.134f} | - | - |
| Phenol | 3,500 ^a | - | - | - |
| Polychlorinated biphenyls (PCBs) | 0 ^a | - | - | - |
| 96-hour average | - | 0.014 ^f | - | - |
| Silvex (2,4,5-TP) | 10 ^{a,b} | - | - | - |
| Tetrachloromethane (carbon tetrachloride) | 5 ^b | - | - | - |
| Toluene | 14,300 ^a | - | - | - |
| Toxaphene | 5 ^b | - | - | - |
| 1-hour average | - | 0.73 ^a | - | - |
| 96-hour average | - | 0.0002 ^a | - | - |
| Tributyltin (TBT) | - | - | - | - |
| 1-hour average | - | 0.46 ^f | - | - |
| 96-hour average | - | 0.072 ^f | - | - |
| 1,1,1-trichloroethane (TCA) | 200 ^b | - | - | - |
| Trichloroethylene (TCE) | 5 ^b | - | - | - |
| Trihalomethanes (total) ⁽⁷⁾ | 100 ^b | - | - | - |

Footnotes:

- (1) One-hour average and 96-hour average concentration limits may be exceeded only once every 3 years. See reference a.
- (2) "Hardness" is expressed as mg/L CaCO₃; and "e" refers to the base of the natural logarithm whose value is 2.718.
- (3) The standards for metals are expressed as total recoverable, unless otherwise noted.
- (4) This standard applies to the dissolved fraction.

- (5) This standard is expressed as free cyanide.
- (6) This standard applies to DDT and its metabolites (i.e., the total concentration of DDT and its metabolites should not exceed this value).
- (7) The standard for trihalomethanes (TTHMs) is the sum of the concentration of bromodichloromethane, dibromochloromethane, tribromomethane (bromoform) and trichloromethane (chloroform). See reference b.

References:

- a. U.S. Environmental Protection Agency, Pub. No. EPA 440/5-86-001, *Quality Criteria for Water* (Gold Book) (1986).
- b. Federal Maximum Contaminant Level (MCL), 40 C.F.R. §§ 141.11, 141.61 and 141.62 (1992).
- c. U.S. Environmental Protection Agency, Pub. No. EPA 440/9-76-023, *Quality Criteria for Water* (Red Book) (1976).
- d. National Academy of Sciences, *Water Quality Criteria* (Blue Book) (1972).
- e. Not used to avoid confusion with “e” as a natural logarithm.
- f. U.S. Environmental Protection Agency, *National Recommended Water Quality Criteria*, May 2009.
- g. Nevada Division of Environmental Protection, *Aquatic Life Water Quality Criteria for Molybdenum*, Tetra Tech, Inc., (June 2008).

Sec. 4. 1. This section and sections 1 and 3 of this regulation become effective on the date on which this regulation is filed by the Legislative Counsel with the Secretary of State.

2. Section 2 of this regulation becomes effective on January 1, 2023.

