



COLORADO

Water Quality
Control Commission

Department of Public Health & Environment

NOTICE OF PUBLIC RULEMAKING HEARING BEFORE THE COLORADO WATER QUALITY CONTROL COMMISSION

SUBJECT:

For consideration of adoption of revised water quality classifications, standards for molybdenum in the Basic Standards and Methodologies for Surface Water, Regulation #31 (5 CCR 1002-31) and Classifications and Numeric Standards for Upper Colorado River Basin and North Platte River (Planning Region 12), Regulation #33 (5 CCR 1002-33).

In these attachments, proposed new language is shown with underlining and proposed deletions are shown with ~~strikeouts~~. Any alternative proposals related to the subject of this hearing will also be considered.

SCHEDULE OF IMPORTANT DATES

Proponent’s prehearing statement due	3/6/2024	Additional information below.
Party Status requests due	3/20/2024	Additional information below.
Responsive prehearing statements due	4/3/2024	Additional information below.
Rebuttal statements due	5/1/2024	Additional information below.
Last date for submittal of motions	5/8/2024	Additional information below.
Prehearing Conference (mandatory for parties)	5/15/2024 1:00 pm	Remote Via Zoom Additional Information below.
Negotiations cutoff	5/22/2024	N/A
Consolidated Proposal	5/30/2024	N/A
Rulemaking Hearing	6/10/2024 9:00 am	Pueblo Convention Center 320 Central Main Street Pueblo, Colorado 81003 Or Remote Via Zoom



HEARING SUBMITTALS:

For this hearing, the commission will receive all submittals electronically. Submittals must be provided as PDF documents, except for raw data exhibits which may be provided as Excel workbooks. Submittals may be emailed to cdphe.wgcc@state.co.us, provided via an FTP site, or otherwise conveyed to the commission office to be received no later than the specified date.

PARTY STATUS:

Party status requests must be in writing and must provide:

- the organization's name,
- one contact person,
- a mailing address,
- a phone number, and
- email addresses of all individuals associated with the party who wish to be notified when new submittals are available on the commission's website for review.

In accordance with section 25-8-104(2)(d), C.R.S., any person who believes that the actions proposed in this notice have the potential to cause material injury to his or her water rights is requested to so indicate, along with an explanation of the alleged harm, in their party status request.

PREHEARING AND REBUTTAL STATEMENTS:

Each party must submit a prehearing statement: parties that have proposed revisions attached as exhibits to the notice must submit a proponent's prehearing statement. All other parties must submit a responsive prehearing statement. Proponents may also submit responsive prehearing statements when there are multiple proposals attached to the notice.

Each prehearing and rebuttal statement must be provided as a separate PDF document from any accompanying written testimony or exhibits.

Following the rebuttal statement due date, no other written materials will be accepted from parties except for good cause shown.

Oral testimony at the hearing should primarily summarize written material previously submitted. The hearing will emphasize commission questioning of parties and other interested persons about their written prehearing submittals. Introduction of written material at the hearing by those with party status will not be permitted unless authorized by the commission.

PREHEARING CONFERENCE:

Attendance at the prehearing conference is mandatory for all persons requesting party status. Following the deadline to request party status, a Zoom link to attend the prehearing conference will be provided to all those who request party status.

Following the cut-off date for motions, no motions will be accepted, except for good cause shown.

PUBLIC PARTICIPATION ENCOURAGED:

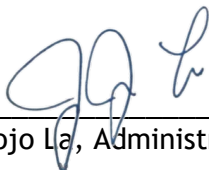
The commission encourages input from non-parties, either orally at the hearing or in writing prior to the hearing. Written submissions should be emailed to cdphe.wqcc@state.co.us by June 5, 2024.

SPECIFIC STATUTORY AUTHORITY:

The provisions of sections 25-8-202(1)(a), (b), and (2); 25-8-203; 25-8-204; and 25-8-402, C.R.S., provide the specific statutory authority for consideration of the regulatory amendments proposed by this notice. Should the commission adopt the regulatory language as proposed in this notice or alternative amendments, it will also adopt, in compliance with section 24-4-103(4) C.R.S., an appropriate Statement of Basis, Specific Statutory Authority, and Purpose.

Dated this 7th day of March 2024 at Denver, Colorado.

WATER QUALITY CONTROL COMMISSION



Jojo La, Administrator

COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Water Quality Control Commission

REGULATION NO. 31 - THE BASIC STANDARDS AND METHODOLOGIES FOR SURFACE WATER

5 CCR 1002-31

[Editor's Notes follow the text of the rules at the end of this CCR Document.]

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31.16 TABLES

(1) INTRODUCTION

The numeric levels for parameters listed in Tables I, II, III shall be considered and applied as appropriate by the Commission in establishing site-specific numeric standards, in accordance with section 31.7.

For the purposes of integrating these parameters into NPDES discharge permits, the duration of the averaging period for the numeric level is designated in the tables. Chronic levels and 30-day levels are to be averaged as defined in section 31.5(7). Acute levels and 1-day levels are to be averaged as defined in section 31.5(2).

Certain toxic metals for Aquatic Life have different numeric levels for different levels of water hardness. Water hardness is being used here as an indication of differences in the complexing capacity of natural waters and the corresponding variation of metal toxicity. Other factors such as organic and inorganic ligands, pH, and other factors affecting the complexing capacity of the waters may be considered in setting site-specific numeric standards in accordance with section 31.7. Metals listed in Table III for aquatic life uses are stated in the dissolved form unless otherwise indicated.

(2) TESTING PROCEDURES

Various testing procedures to determine that numeric values for water quality parameters may be appropriate to present to the Water Quality Control Commission at stream classification hearings. (See section 31.6(3)). These include:

- (a) Standard Test Procedures
 - (i) Code of Federal Regulations, Title 40, Part 136;
 - (ii) The latest approved EPA Methods for Chemical Analysis of Water and Wastes;
 - (iii) Standard Methods for the Examination of Water and Wastewater (current edition), American Public Health Association;
 - (iv) ASTM Standards, Part 31, Water;
 - (v) EPA Biological Field and Laboratory Methods.
- (b) Toxicity testing and Criteria Development Procedures:

- (i) The latest EPA Methods for Chemical Analysis of Water and Wastewater; ASTM, Standard Methods for Examination of Water, Wastewater;
 - (ii) Interim Guidance on Determination and Use of Water-Effect Ratio for Metals, EPA-823-B-94-001, U.S. Environmental Protection Agency, February, 1994.
 - (iii) Other approved EPA methods.
- (c) Other Procedures:
- Other procedures may be deemed appropriate by either the Water Quality Control Commission and/or the Water Quality Control Division.

(3) REFERENCES

Capital letters following levels in the tables indicate the sources of the level; they are referenced below.

- (A) EPA Quality Criteria for Water, July 1976, U.S. Environmental Protection Agency, U.S. Government Printing Office: 1977 0-222-904, Washington, D.C. 256 p.
- (B) EPA Water Quality Criteria 1972, Ecological Research Series, National Academy of Sciences, National Academy of Engineering, EPA-R3-73-033, March 1973, Washington, D.C. 594 p.
- (C) Davies, P.H. and Goettl, J.P., Jr., July 1976, Aquatic Life - Water Quality Recommendations for Heavy Metal and Other Inorganics.
- (D) Parametrix Inc., Attachment II, Parametrix Reports - Toxicology Assessments of As, Cu, Fe, Mn, Se, and Zn, May 1976, Bellevue, Washington, 98005. submitted to Water Quality Control Commission by Gulf Oil Corp., Inc., 161 p.
- (E) EPA National Interim Primary Drinking Water Regulations, 40 Code of Federal Regulations, Part 141.
- (F) EPA, March 1977, Proposed National Secondary Drinking Water Regulation, Federal Register, Vol. 42 No. 62, pp 17143-17147.
- (G) Recommendations based on review of all available information by the Committee on Water Quality Standards and Stream Classification.
- (H) American Fishery Society, June 1978, A Review of the EPA Red Book Quality Criteria for Water, (Preliminary Edition).
- (I) Section 307 of the Clean Water Act, regulations promulgated pursuant to Section 307.
- (J) Final Report of the Water Quality Standards and Methodologies Committee to the Colorado Water Quality Control Commission, June 1986.
- (K) Proposed Nitrogenous Water Quality Standards for the State of Colorado, by the Nitrogen Cycle Committee of the Basic Standards Review Task Force, March 12, 1986 (Final Draft).
- (L) Quality Criteria for Water, 1986, and Updates Through 1989, U.S. Environmental Protection Agency, U.S. Government Printing Office, EPA 440/5-86-001, Washington, D.C. 20460.
- (M) Level modified by Commission

(N) 1999 Update of Ambient Water Quality Criteria for Ammonia (1999 Ammonia Update), U.S. Environmental Protection Agency, Office of Water, EPA-823-F-99-024, Washington, D.C. 20460.

(O) Raisbeck, M.F., S. L. Riker, C. M. Tate, R. Jackson, M. A. Smith, K. J. Reddy and J. R. Zygmunt. 2008. Water quality for Wyoming livestock and wildlife. University of Wyoming AES Bulletin B-1183.

(P) Agency for Toxic Substances and Disease Registry, Toxicological Profile for Molybdenum, May 2020

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TABLE III - METAL PARAMETERS

TABLE III METAL PARAMETERS (concentration in µg/L)						
Metal ⁽¹⁾	Aquatic Life ^{(1)(3)(4)(J)}		Agriculture ⁽²⁾	Domestic Water Supply ⁽²⁾	Water + Fish ⁽⁷⁾	Fish Ingestion ⁽¹⁰⁾
	ACUTE	CHRONIC	CHRONIC		CHRONIC	CHRONIC
Aluminum	$e^{(1.3695 \cdot \ln(\text{hardness}) + 1.8308)}$ (total recoverable)	87 or $e^{(1.3695 \cdot \ln(\text{hardness}) - 0.1158)}$ (total recoverable) ⁽¹¹⁾			---	---
Antimony ⁽¹⁸⁾				6.0 (chronic)	5.6	640
Arsenic	340	150	100 ^(A)	0.02 – 10 ⁽¹³⁾ (chronic)	0.02	7.6
Barium ⁽¹⁸⁾				1,000 ^(E) (acute) 490 (chronic)	---	---
Beryllium ⁽¹⁸⁾			100 ^(A,B)	4.0 (chronic)	---	---
Cadmium	Warm ⁽¹⁷⁾ = $(1.136672 - \ln(\text{hardness}) * 0.041838) * e^{(0.9789 \cdot \ln(\text{hardness}) - 3.443)}$ Cold ⁽¹⁷⁾ = $(1.136672 - \ln(\text{hardness}) * 0.041838) * e^{(0.9789 \cdot \ln(\text{hardness}) - 3.866)}$	$(1.101672 - \ln(\text{hardness}) * 0.041838) * e^{(0.7977 \cdot \ln(\text{hardness}) - 3.909)}$	10 ^(B)	5.0 ^(E) (acute)	---	---
Chromium III ⁽⁵⁾	$e^{(0.819 \cdot \ln(\text{hardness}) + 2.5736)}$	$e^{(0.819 \cdot \ln(\text{hardness}) + 0.5340)}$	100 ^(B)	50 ^(E) (acute)	---	---
Chromium VI ⁽⁵⁾	16	11	100 ^(B)	50 ^(E) (acute)	100	---
Copper	$e^{(0.9422 \cdot \ln(\text{hardness}) - 1.7408)}$	$e^{(0.8545 \cdot \ln(\text{hardness}) - 1.7428)}$	200 ^(B)	1,000 ^(F) (chronic)	1,300	---
Iron		1,000 (total recoverable) ^(A,C)		300 (dissolved) ^(F) (chronic)	---	---
Lead	$(1.46203 - \ln(\text{hardness}) * 0.145712) * e^{(1.273 \cdot \ln(\text{hardness}) - 1.46)}$	$(1.46203 - \ln(\text{hardness}) * 0.145712) * e^{(1.273 \cdot \ln(\text{hardness}) - 4.705)}$	100 ^(B)	50 ^(E) (acute)	—	---
Manganese	$e^{(0.3331 \cdot \ln(\text{hardness}) + 6.4676)}$	$e^{(0.3331 \cdot \ln(\text{hardness}) + 5.8743)}$	200 ^{(B)(12)}	50 (dissolved) ^(F) (chronic)	—	---

TABLE III METAL PARAMETERS (concentration in µg/L)						
Metal ⁽¹⁾	Aquatic Life ^{(1)(3)(4)(J)}		Agriculture ⁽²⁾	Domestic Water Supply ⁽²⁾	Water + Fish ⁽⁷⁾	Fish Ingestion ⁽¹⁰⁾
	ACUTE	CHRONIC	CHRONIC		CHRONIC	CHRONIC
Mercury		FRV(fish) ⁽⁶⁾ = 0.01 (total recoverable)		2.0 ^(E) (acute)	—	---
Molybdenum			300 ^{(O)(15)}	240 -1,600 ^(P) (chronic)		
Nickel	$e^{(0.846*\ln(\text{hardness})+2.253)}$	$e^{(0.846*\ln(\text{hardness})+0.0554)}$	200 ^(B)	100 ^(E) (chronic)	610	4,600
Selenium ⁽⁹⁾	18.4	4.6	20 ^(B,D)	50 ^(E) (chronic)	170	4,200
Silver	$0.5 * e^{(1.72*\ln(\text{hardness})-6.52)}$	$e^{(1.72*\ln(\text{hardness})-9.06)}$ Trout ⁽¹⁹⁾ = $e^{(1.72*\ln(\text{hardness})-10.51)}$		100 ^(F) (acute)	—	---
Thallium ⁽¹⁸⁾		15 ^(C)		0.5 (chronic)	0.24	0.47
Uranium ⁽¹⁶⁾	$e^{(1.1021*\ln(\text{hardness})+2.7088)}$	$e^{(1.1021*\ln(\text{hardness})+2.2382)}$		16.8 – 30 ⁽¹³⁾ (chronic)	---	---
Zinc	$0.978 * e^{(0.9094*\ln(\text{hardness})+0.9095)}$	$0.986 * e^{(0.9094*\ln(\text{hardness})+0.6235)}$ Sculpin ⁽¹⁴⁾ = $e^{(2.140*\ln(\text{hardness})-5.084)}$	2000 ^(B)	5,000 ^(F) (chronic)	7,400	26,000

Note: Capital letters in parentheses refer to references listed in section 31.16(3); numbers in parentheses refer to Table III footnotes.

Table III – Footnotes

- (1) Metals for aquatic life use are stated as dissolved unless otherwise specified.

Where the hardness-based equations in Table III are applied as table value water quality standards for individual water segments, those equations define the applicable numerical standards. As an aid to persons using this regulation, Table IV provides illustrative examples of approximate metals values associated with a range of hardness levels. This table is provided for informational purposes only.

- (2) Metals for agricultural and domestic uses are stated as total recoverable unless otherwise specified.

- (3) Hardness values to be used in equations are in mg/L as calcium carbonate and shall be no greater than 400 mg/L. The exception is for aluminum, where the upper cap on calculations is a hardness of 220 mg/L. For permit effluent limit calculations, the hardness values used in calculating the appropriate metal standard should be based on the lower 95 percent confidence limit of the mean hardness value at the periodic low flow criteria as determined from a regression analysis of site specific data. Where insufficient site-specific data exists to define the mean hardness value at the periodic low flow criteria, representative regional data shall be used to perform the regression analysis. Where a regression analysis is not possible, a site-specific method should be used, e.g., where hardness data exists without paired flow data, the mean of the hardness during the low flow season established in the permit shall be used. In calculating a hardness value, regression analyses should not be extrapolated past the point that data exist. For determination of standards attainment, where paired metal/hardness data is available, attainment will be determined for individual sampling events. Where paired data is not available, the mean hardness will be used.

- (4) Both acute and chronic numbers adopted as stream standards are levels not to be exceeded more than once every three years on the average.

- (5) Unless the stable forms of chromium in a water body have been characterized and shown not to be predominantly chromium VI, data reported as the measurement of all valence states of chromium combined should be treated as chromium VI. In addition, in no case can the sum of the concentrations of chromium III and chromium VI or data reported as the measurement of all valence states of chromium combined exceed the water supply standards of 50 µg/L chromium in those waters classified for domestic water use.

- (6) FRV means Final Residue Value and should be expressed as “total recoverable” mercury. The term “total recoverable” refers to the mineral acid digestion of an unfiltered sample to account for all forms of mercury present in water. Mercury data analyzed and reported as “total” or “total recoverable” mercury by using EPA approved total mercury analysis methods listed in 40 CFR 136.3 are considered equivalent.

Many forms of mercury are readily converted to toxic forms under natural conditions. The FRV of 0.01 µg/liter is the maximum allowed concentration of total mercury in the water. This value is estimated to prevent bioaccumulation of methylmercury in edible fish or shellfish tissue above the fish tissue standard for methylmercury of 0.3 mg/kg.

In waters supporting populations of fish or shellfish with a potential for human consumption, the Commission can adopt the FRV as the stream standard to be applied as a 30-day average. Alternatively, the Commission can adopt site-specific ambient-based standards for mercury in accordance with section 31.7(1)(b)(ii) and (iii). Site-specific water-column standards shall be calculated from the site-specific bioaccumulation factor, using measured water column concentrations of total mercury and measured fish tissue concentrations of methylmercury. Fish tissue data shall be collected from species of the highest trophic level present in the waterbody. Fish tissue samples should include older, larger individuals present in the waterbody. A bioaccumulation factor should be calculated separately for each species sampled, and the highest bioaccumulation factor should be used to calculate the site-specific water column standard in order to prevent the average fish tissue concentrations from exceeding 0.3 mg/kg for all species.

- (7) Applicable to all Class 1 aquatic life segments which also have a water supply classification or Class 2 aquatic life segments which also have a water supply classification designated by the Commission after rulemaking hearing. These Class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the Water + Fish ingestion criteria to warrant the adoption of Water + Fish ingestion standards for the segment in question.
- (8) The use of 0.1 micron pore size filtration for determining dissolved iron is allowed as an option in assessing compliance with the drinking water standard.
- (9) Selenium is a bioaccumulative metal and subject to a range of toxicity values depending upon numerous site-specific variables.
- (10) Applicable to the following segments which do not have a water supply classification: all Class 1 aquatic life segments or Class 2 aquatic life segments designated by the Commission after rulemaking hearing. These class 2 segments will generally be those where fish of a catchable size and which are normally consumed are present, and where there is evidence that fishing takes place on a recurring basis. The Commission may also consider additional evidence that may be relevant to a determination whether the conditions applicable to a particular segment are similar enough to the assumptions underlying the fish ingestion criteria to warrant the adoption of fish ingestion standards for the segment in question.
- (11) Where the pH is equal to or greater than 7.0 in the receiving water after mixing, the chronic hardness-dependent equation will apply. Where pH is less than 7.0 in the receiving water after mixing, either the 87 µg/L chronic total recoverable aluminum criterion or the criterion resulting from the chronic hardness-dependent equation will apply, whichever is more stringent.
- (12) This standard is only appropriate where irrigation water is applied to soils with pH values lower than 6.0.
- (13) Whenever a range of standards is listed and referenced to this footnote, the first number in the range is a strictly health-based value, based on the Commission's established methodology for human health-based standards. The second number in the range is a maximum contaminant level, established under the federal Safe Drinking Water Act that has been determined to be an acceptable level of this chemical in public water supplies, taking treatability and laboratory detection limits into account. Control requirements, such as discharge permit effluent limitations, shall be established using the first number in the range as the ambient water quality target, provided that no effluent limitation shall require an "end-of-pipe" discharge level more restrictive than the second number in the range. Water bodies will be considered in attainment of this standard, and not included on the Section 303(d) List, so long as the existing ambient quality does not exceed the second number in the range.

- (14) The chronic zinc equation for sculpin applies in areas where mottled sculpin are expected to occur and hardness is less than 102 ppm CaCO₃. The regular chronic zinc equation applies in areas where mottled sculpin are expected to occur, but the hardness is greater than 102 ppm CaCO₃.
- (15) In determining whether adoption of a molybdenum standard is appropriate for a segment, the Commission will consider whether livestock or irrigated forage is present or expected to be present. The table value assumes that copper and molybdenum concentrations in forage are 7 mg/kg and 0.5 mg/kg respectively, forage intake is 6.8 kg/day, copper concentration in water is 0.008 mg/L, water intake is 54.6 L/day, copper supplementation is 48 mg/day, and that a Cu:Mo ratio of 4:1 is appropriate with a 0.075 mg/L molybdenum margin of safety. Numeric standards different than the table-value may be adopted on a site-specific basis where appropriate justification is presented to the Commission. In evaluating site-specific standards, the relevant factors that should be considered include the presence of livestock or irrigated forage, and the total intake of copper, molybdenum, and sulfur from all sources (i.e., food, water, and dietary supplements). In general, site-specific standards should be based on achieving a safe copper:molybdenum total exposure ratio, with due consideration given to the sulfur exposure. A higher Cu:Mo ratio may be necessary where livestock exposure to sulfur is also high. Species specific information shall be considered where cattle are not the most sensitive species.
- (16) When applying the table value standards for uranium to individual segments, the Commission shall consider the need to maintain radioactive materials at the lowest practical level as required by Section 31.11(2) of the Basic Standards regulation.
- (17) The acute(warm) cadmium equation applies to segments classified as Aquatic Life Warm Class 1 or 2. The acute(cold) cadmium equation applies to segments classified as Aquatic Life Cold Class 1 or 2.
- (18) Consistent with 31.7(1)(b) and 31.7(2), these table values will be applied on a site-specific basis.
- (19) The chronic silver equation for trout applies in areas where trout are expected to occur. The regular chronic silver equation applies in areas where trout are not expected to occur.

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31.61 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 10, 2024 RULEMAKING; FINAL ACTION XX, 2024; EFFECTIVE DATE DECEMBER 31, 2024

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The commission also adopted, in compliance with 24-4-103(4) C.R.S., the following statement of basis and purpose.

BASIS AND PURPOSE

I. Molybdenum Water Supply Standard

The commission adopted a revised Water Supply standard for total recoverable molybdenum, calculated using the non-cancer equation and some of the default exposure assumptions from Policy 96-2 in combination with a reference dose (RfD) of 0.06 mg/kg-day derived from the Agency for Toxic Substances and Disease Registry (ATSDR). The Water Supply standard uses a relative source contribution (RSC) of 0.8 and the U.S. Environmental Protection Agency (EPA) updated exposure factors, as discussed below. The calculations resulted in a chronic Water Supply standard of 1,600 µg/L.

A. Calculation of Revised Molybdenum Standard

In adopting the revised molybdenum standard, the commission relied on its past policy decisions and precedence documented in Commission Policy 96-2, along with the EPA *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health* (2000).

1. Reference Dose

As per Departmental policy, the commission has relied on toxicity information from ATSDR as its source of toxicological data.

The commission declined to use EPA's 1992 Integrated Risk Information System (IRIS) assessment for molybdenum, because it is outdated and based on a study by Koval'skiy et al. (1961) that has been widely discredited. The commission previously departed from the EPA IRIS for molybdenum when it first adopted the Water Supply standard for molybdenum in 2010 based on Fungwe et al. (1990). The commission at that time acknowledged there were ongoing studies on molybdenum, and it urged that the standard be reviewed and revised in the future. See Section 31.48(I)(H).

Since the 2010 rulemaking, significant advances have been made in the development of toxicological information regarding the effects of molybdenum on human health, including three peer-reviewed and published studies in 2014 and 2019 that were conducted according to the Organization for Economic Cooperation and Development (OECD) guidelines and Good Laboratory Practice. ATSDR considered these studies in its 2020 Toxicological Profile for Molybdenum, and in calculating its minimum risk level (MRL) of 0.06 mg/kg/day. ATSDR calculated this MRL using the no observed adverse effect level (NOAEL) of 17 mg Molybdenum/kg/day, and by applying an uncertainty factor of 100 (10 for interspecies, 10 for intraspecies). ATSDR also applied a modifying factor of 3, for a total uncertainty factor of 300, based on its speculation that a higher copper content in the diet in one of the 2014 studies may explain the differences in the results of that study and the results of the Fungwe et al. (1990) study.

The commission recognizes that more recent peer-reviewed and published studies suggest a lack of support for the ATSDR's application of the modifying factor of 3, and call into question the results of Fungwe et al. (1990). However, at this time the commission did not make any modifications to the ATSDR's findings. The commission will review the molybdenum standard based on future risk assessments.

Further, the commission determined that an additional uncertainty factor to account for extrapolation from a subchronic study to estimate chronic exposure conditions was not necessary and would be unprecedented for an essential element. Molybdenum is an essential element and therefore, chronic exposures of molybdenum are required for proper nutrition.

Thus, the commission used the ATSDR MRL of 0.06 mg/kg-day as the RfD-like value in calculating the revised Water Supply standard for molybdenum.

2. Relative Source Contribution

The RSC is the percentage of the total daily exposure to molybdenum contributed by drinking water. Information was presented at the hearing to support departure from the default RSC of 0.2, as provided for in Commission Policy 96-2. This information included a detailed analysis using the Exposure Decision Tree from EPA's *Methodology for Deriving Ambient Water Quality Criteria for the Protection of Human Health* (2000), demonstrating that intake from the diet and other potential exposure pathways (air, soil, etc.) is a small percentage of the calculated RfD for molybdenum.

Based on this information, the commission applied an RSC of 0.8 in calculating the revised Water Supply standard for molybdenum.

3. Body weight and daily drinking water consumption

In 2015, EPA updated its exposure factors of a mean adult (21 years and older). The body weight factor was increased from 70 kilograms to 80 kilograms, and the drinking water ingestion rate was increased from 2 liters to 2.4 liters per day. The commission applied the EPA updated exposure factors as they rely on more recent exposure data than those used to derive the exposure factors in Commission Policy 96-2. This decision is also consistent with recent commission actions on other human health standards.

Therefore, the commission applied the average body weight of 80 kg and daily drinking water consumption rate of 2.4 L/day in calculating the revised Water Supply standard for molybdenum.

B. Summary

Applying the RfD-like value from ATSDR (2020) of 0.06 mg/kg/day, RSC of 0.8, and updated exposure factors of 80 kg body weight and 2.4 L/day drinking water consumption rate, the commission calculated a revised Water Supply molybdenum standard of 1,600 µg/L. This revised standard was adopted in Section 31.16, Table III.

II. Consideration of Statutory Requirements

In adopting the revised Water Supply molybdenum standard, the commission has considered the factors enumerated in Section 25-8-204(4), C.R.S. The commission has considered evidence regarding the need for standards to regulate molybdenum, the existing low levels of molybdenum statewide, the fact that molybdenum is naturally occurring in Colorado, and the importance of molybdenum to human health and development as an essential element. The commission has also considered the technical evidence regarding treatment techniques to achieve the revised standard of 1,600 µg/L. Pursuant to Section 25-8-102(5), C.R.S., the commission also found that the revised standard is economically reasonable and consistent with a water quality program in which the water quality benefits of pollution control measures utilized have a reasonable relationship to the economic, environmental, energy, and public health costs and impacts of those measures. Based on the evidence presented, the commission believes that the revised standard will support the beneficial uses of State waters, including drinking water, and that the standard adopted is appropriate and scientifically supported by the record.

III. Other Changes

The commission added a new reference at Section 31.16(3)(P) for the ATSDR Toxicological Profile for Molybdenum. A notation was added to the 1,600 µg/L standard to refer to this profile.

The commission also adopted the revised 1,600 µg/L standard on one water quality segment in Regulation 33. No other segments received this updated value at this time.

DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT

Water Quality Control Commission

REGULATION NO. 33 - CLASSIFICATIONS AND NUMERIC STANDARDS FOR UPPER COLORADO RIVER BASIN AND NORTH PLATTE RIVER (PLANNING REGION 12)

5 CCR 1002-33

[Editor's Notes follow the text of the rules at the end of this CCR Document.]

... **33.70 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE:
JUNE 10, 2024 RULEMAKING; FINAL ACTION AUGUST 12, 2024; EFFECTIVE DATE
DECEMBER 31, 2024**

The provisions of C.R.S. 25-8-202(1)(a), (b) and (2); 25-8-203; 25-8-204; and 25-8-402; provide the specific statutory authority for adoption of these regulatory amendments. The Commission also adopted in compliance with 24-4-103(4) C.R.S. the following statement of basis and purpose.

BASIS AND PURPOSE

Blue River Segment 14 (COUCBL14):

The commission replaced the 210 µg/L chronic molybdenum standard on Tenmile Creek with the revised Regulation 31 chronic table value standard (TVS) for molybdenum to protect the water supply use of 1,600 µg/L.

Climax Molybdenum Company (Climax) has been working on molybdenum water quality standards issues with stakeholders for over a decade. Climax operates the Climax Mine, a molybdenum mine in Summit and Lake Counties, Colorado, that is permitted to discharge to Tenmile Creek, Blue River Segment 13 (COUCBL13). Blue River Segment 13 does not have a molybdenum standard because it is not classified as water supply use, and because livestock or irrigated forage are not expected to be present. Blue River Segment 14 is the next downstream segment from Segment 13 and is classified as water supply use. The commission adopted a water supply-use based standard for molybdenum of 210 µg/L on Segment 14 in the 2014 hearing. The agriculture use standard does not apply to Segment 14 because livestock or irrigated forage are not expected to be present. See Section 33.52(E).

There has been significant uncertainty with the water supply use-based standard for molybdenum of 210 µg/L since its adoption in Regulation 31 in 2010, and on Blue River Segment 14 in 2014, given questions about the science and new toxicological studies that were being conducted. See Section 33.52(J). In recognition of this uncertainty, the commission in 2014 adopted a "current condition" temporary modification to the molybdenum standard on Segment 14, and in a later hearing, defined this "current condition" to include a 95th percentile effluent concentration at Climax's Outfall 001A of 1,610 µg/L. See Section 33.63(A). The temporary modification was extended several times to await consideration of a revised molybdenum standard on Regulation 31, which was postponed based on delays in issuance of the Agency for Toxic Substances and Disease Registry (ATSDR) final toxicological profile for molybdenum and based on the commission's hearing schedule. See Sections 33.60, 33.63(A).

ATSDR issued its final profile in May 2020. In January 2022, Climax petitioned the commission to reschedule the molybdenum standards hearing, which had been postponed since 2017. The hearing was rescheduled for June 2023 and the temporary modification was extended through December 31, 2023. The commission later postponed the hearing to revise the molybdenum standards until June 2024 based on resource constraints.

In this 2024 hearing, the commission adopted Climax's proposed revisions to the Regulation 31 TVS for molybdenum, adopting a human health-based standard of 1,600 µg/L consistent with the ATSDR Toxicological Profile for Molybdenum issued in May 2020. The commission also determined that a relative source contribution (RSC) of 0.8 was justified based on information presented during this hearing.

The commission simultaneously adopted the revised Regulation 31 TVS of 1,600 µg/L on one water quality segment, Blue River Segment 14. Based on the information presented, the commission determined that the RSC of 0.8 was also justified for Blue River Segment 14, and that a site-specific RSC was not necessary.

The commission also heard an update on the progress of the Climax Mine molybdenum removal water treatment plant (MRWTP). Climax began construction of the \$120 million MRWTP in 2022 and is scheduled to complete construction in the first quarter of 2025.

Finally, the commission removed references to the temporary modification on Blue River Segment 14 due to its expiration on December 31, 2023.

**COLORADO DEPARTMENT OF PUBLIC HEALTH AND ENVIRONMENT
WATER QUALITY CONTROL COMMISSION**

5 CCR 1002-33

**REGULATION NO. 33
CLASSIFICATIONS AND NUMERIC STANDARDS
FOR
UPPER COLORADO RIVER BASIN AND
NORTH PLATTE RIVER (PLANNING REGION 12)**

**APPENDIX 33-1
Stream Classifications and Water Quality Standards Tables**

Effective 12/31/202~~3~~4

Abbreviations and Acronyms

Aq	=	Aquatic
°C	=	degrees Celsius
CL	=	cold lake temperature tier
CLL	=	cold large lake temperature tier
CS-I	=	cold stream temperature tier one
CS-II	=	cold stream temperature tier two
D.O.	=	dissolved oxygen
DM	=	daily maximum temperature
DUWS	=	direct use water supply
E. coli	=	<i>Escherichia coli</i>
EQ	=	existing quality
mg/L	=	milligrams per liter
mg/m ²	=	milligrams per square meter
mL	=	milliliter
MWAT	=	maximum weekly average temperature
OW	=	outstanding waters
sc	=	sculpin
SSE	=	site-specific equation
T	=	total recoverable
t	=	total
tr	=	trout
TVS	=	table value standard
µg/L	=	micrograms per liter
UP	=	use-protected
WS	=	water supply
WS-I	=	warm stream temperature tier one
WS-II	=	warm stream temperature tier two
WS-III	=	warm stream temperature tier three
WL	=	warm lake temperature tier

REGULATION #33 STREAM CLASSIFICATIONS and WATER QUALITY STANDARDS

Blue River Basin

13. Mainstem of Tenmile Creek from the Climax Parshall Flume (39.447556, -106.157003) to a point immediately above the confluence of West Tenmile Creek and all tributaries and wetlands from the source of Tenmile Creek to a point immediately above the confluence with West Tenmile Creek, except for the specific listing in Segment 15.							
COUCBL13	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1 Recreation P	Temperature °C	CS-I	CS-I	Arsenic	340	---
Qualifiers:			acute	chronic	Arsenic(T)	---	7.6
Other:	D.O. (mg/L)	---	6.0		Cadmium	TVS	TVS
*Any water quality based effluent limit shall not cause or contribute to exceedances of water quality standards adopted to protect downstream uses. *Phosphorus(chronic) = applies only above the facilities listed at 33.5(4). *Uranium(acute) = See 33.5(3) for details. *Uranium(chronic) = See 33.5(3) for details.	D.O. (spawning)	---	7.0		Chromium III	TVS	TVS
	pH	6.5 - 9.0	---		Chromium III(T)	---	100
	chlorophyll a (mg/m ²)	---	TVS		Chromium VI	TVS	TVS
	E. Coli (per 100 mL)	---	205		Copper	TVS	TVS
	Inorganic (mg/L)				Iron(T)	---	1000
		acute	chronic		Lead	TVS	TVS
	Ammonia	TVS	TVS		Manganese	TVS	TVS
	Boron	---	0.75		Mercury(T)	---	0.01
	Chloride	---	---		Molybdenum(T)	---	---
	Chlorine	0.019	0.011		Nickel	TVS	TVS
	Cyanide	0.005	---		Selenium	TVS	TVS
	Nitrate	100	---		Silver	TVS	TVS(tr)
	Nitrite	---	0.05		Uranium	varies*	varies*
	Phosphorus	---	TVS*		Zinc	TVS	TVS/TVS(sc)
	Sulfate	---	---				
Sulfide	---	0.002					
14. Mainstem of Tenmile Creek, including all tributaries and wetlands, from a point immediately above the confluence with West Tenmile Creek to Dillon Reservoir, except for the specific listings in Segment 16.							
COUCBL14	Classifications	Physical and Biological			Metals (ug/L)		
Designation	Agriculture		DM	MWAT		acute	chronic
Reviewable	Aq Life Cold 1 Recreation E Water Supply	Temperature °C	CS-I	CS-I	Arsenic	340	---
Qualifiers:			acute	chronic	Arsenic(T)	---	0.02
Other:	D.O. (mg/L)	---	6.0		Cadmium	TVS	TVS
Temporary Modification(s): Arsenic(chronic) = hybrid Expiration Date of 12/31/2024 Molybdenum(chronic) = current conditions* Expiration Date of 12/31/2023 *Phosphorus(chronic) = applies only above the facilities listed at 33.5(4). *Uranium(acute) = See 33.5(3) for details. *Uranium(chronic) = See 33.5(3) for details. *TempMod: Molybdenum = Adopted 6/9/2014	D.O. (spawning)	---	7.0		Cadmium(T)	5.0	---
	pH	6.5 - 9.0	---		Chromium III	---	TVS
	chlorophyll a (mg/m ²)	---	TVS		Chromium III(T)	50	---
	E. Coli (per 100 mL)	---	126		Chromium VI	TVS	TVS
	Inorganic (mg/L)				Copper	TVS	TVS
		acute	chronic		Iron	---	WS
	Ammonia	TVS	TVS		Iron(T)	---	1000
	Boron	---	0.75		Lead	TVS	TVS
	Chloride	---	250		Lead(T)	50	---
	Chlorine	0.019	0.011		Manganese	TVS	TVS/WS
	Cyanide	0.005	---		Mercury(T)	---	0.01
	Nitrate	10	---		Molybdenum(T)	---	240 1600
	Nitrite	---	0.05		Nickel	TVS	TVS
	Phosphorus	---	TVS*		Nickel(T)	---	100
	Sulfate	---	WS		Selenium	TVS	TVS
Sulfide	---	0.002		Silver	TVS	TVS(tr)	
				Uranium	varies*	varies*	
				Zinc	TVS	TVS/TVS(sc)	

All metals are dissolved unless otherwise noted.
 T = total recoverable
 t = total
 tr = trout
 sc = sculpin

D.O. = dissolved oxygen
 DM = daily maximum
 MWAT = maximum weekly average temperature
 See 33.6 for further details on applied standards.