

selenium standards for Segment 16j were calculated using data from locations near the confluence of each tributary with the South Platte River. The Commission specified assessment locations at Reg. 38.6(4)(h) in order to ensure that future assessment is consistent with the methods used to derive the standards. Other than the selenium standards, Segment 16j inherits the use classifications, antidegradation designation, and water quality standards from Segment 16c because the evidence was limited to selenium standards.

Clear Creek segment 13b (North Fork of Clear Creek): The Commission considered the temporary modification for Clear Creek segment 13b. Black Hawk/Central City Sanitation District and the City of Black Hawk ("BH/CCSD") proposed extending the temporary modification for cadmium in Clear Creek Segment 13b. Evidence submitted by BH/CC shows that the metals concentrations in Clear Creek are the result of a combination of natural and human-induced conditions which are currently the focus of Superfund cleanup work. Additional cleanup is planned as part of OU4, including the construction of a new mine wastewater treatment plant to treat discharges from the National Tunnel, Gregory Gulch and Gregory Incline. Additional cleanup is also planned for the Quartz Hill mine tailings pile, including re-grading and capping. These efforts are not expected to be completed until 2015 at the earliest, and are expected to result in significant water quality improvements within Clear Creek, segment 13b. The degree of improvement is still uncertain and will not be known until after the treatment measures are implemented and the improvements are quantified.

The BH/CCSD has a predicted water quality-based effluent limit compliance problem for cadmium, however they do not have a predicted compliance problem for the other metals. Therefore, the Commission deleted the temporary modifications for manganese, zinc and iron. In addition, the Commission extended the expiration date of the temporary modification for dissolved cadmium on Clear Creek Segment 13b to December 31, 2018, to allow time for the treatment measures to be implemented and the improvements to be quantified. The temporary modifications will be reviewed in the 2016 and 2017 annual temporary modification review hearing. A 2018 expiration date will allow for a 2016 review of the status of the temporary modification prior to the BH/CCSD permit renewal in 2017, and may lead to an extension of the temporary modification if that is determined appropriate based on information available at the 2016 review.

PARTIES TO THE RULEMAKING HEARING

1. Rio Grande Silver, Inc.
2. Black Hawk/Central City Sanitation District and City of Black Hawk
3. Centennial Water & Sanitation District, City of Littleton, City of Englewood
4. Colorado Parks and Wildlife
5. Homestake Mining Company of California
6. Metro Wastewater Reclamation District
7. South Platte Coalition for Urban River Evaluation (SP CURE)
8. City of Boulder
9. Seneca Coal
10. Tri-State Generation and Transmission Association
11. City of Fort Collins
12. MillerCoors, LLC
13. Environmental Protection Agency
14. Barr Lake and Milton Reservoir Watershed Association
15. Plum Creek Water Reclamation Authority

38.89 STATEMENT OF BASIS SPECIFIC STATUTORY AUTHORITY AND PURPOSE DECEMBER 8, 2014 RULEMAKING; FINAL ACTION JANUARY 12, 2015; EFFECTIVE DATE JUNE 30, 2015

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

Pursuant to the requirements in the Basic Standards (at 31.7(3)), the Commission reviewed the status of temporary modifications scheduled to expire before December 31, 2016, to determine whether the temporary modification should be modified, eliminated or extended.

No action: The Commission took no action on the temporary modifications on the following segments. Unless otherwise noted, these temporary modifications will expire 12/31/2015. The basin-wide review hearing is scheduled for June 2015 and it is anticipated that any remaining issues will be resolved in that hearing process.

Upper South Platte River segment 10a, copper
Upper South Platte River segment 14, copper, temperature
Upper South Platte River segment 15, ammonia, copper, temperature
Upper South Platte River segment 16g, copper, temperature
Upper South Platte River segment 16i, copper

Bear Creek Basin segment 1c, chlorophyll, total phosphorus

Clear Creek Basin segment 2a, zinc, copper (expiration date of 7/01/2015)
Clear Creek Basin segment 2c, copper (expiration date of 7/01/2015)
Clear Creek Basin segment 9a, copper (expiration date of 7/01/2015)
Clear Creek Basin segment 11, copper (expiration date of 7/01/2015)
Clear Creek Basin segment 14a, copper, temperature
Clear Creek Basin segment 14b, copper, temperature
Clear Creek Basin segment 15, copper, temperature

Boulder Creek Basin segment 8, selenium (expiration date of 7/01/2015)
Boulder Creek Basin segment 9, Copper (expiration date of 7/01/2015)

St.Vrain Creek Basin segment 2b, copper
St.Vrain Creek Basin segment 6, selenium

Middle South Platte Basin segment 1a, selenium, ammonia
Middle South Platte Basin segment 4, Barr Lake and Milton Reservoirs, pH

Big Thompson River Basin segment 2, DO, E.coli, ammonia, nitrate, boron, cadmium, copper
lead, mercury, nickel, selenium, silver, and zinc
Big Thompson River Basin segment 4b, selenium
Big Thompson River Basin segment 5, selenium
Big Thompson Basin River segment 9, selenium

Cache La Poudre River segment 11, selenium
Cache La Poudre River segment 12, selenium
Cache La Poudre River segment 13b, selenium

Lower South Platte River Basin segment 1, selenium

Extension of Temporary Modification: Site-specific copper standards for Upper South Platte segment 10a based on the Biotic Ligand Model were proposed by Plum Creek Water Reclamation Authority (PCWRA). During the course of the hearing process and discussion with the Division, EPA and other parties, PCWRA modified its proposal. The Commission adopted PCWRA's modified proposal to extend the temporary modification to 12/31/2018 and change the statement of the temporary modification to "current condition". The Commission expects that PCWRA will participate in discussions in 2015 with the WQCD and other stakeholders about the FMB application of the BLM.

The Commission extended until July 1, 2020, the temporary modifications for Clear Creek Segment 2a zinc and for Segment 2c copper. The Commission found that: these segments are not currently meeting the respective standards; the Georgetown Wastewater Treatment Facility anticipates problems meeting the zinc standard; the Central Clear Creek Sanitation District Wastewater Treatment Facility anticipates problems meeting the copper standard, and; there are additional ongoing and future remedial activities for metals that could significantly contribute to achieving either or both of these standards. The extent of remedial activities by EPA and CDPHE under CERCLA and by other stakeholders is a key consideration in resolving the uncertainty as to appropriate water quality standards. The extension until July 1, 2020 is intended to allow review of these temporary modifications after the next (2019) CERCLA Five-Year Review is completed.

New Temporary Modification: The Commission adopted a new temporary modification of the ammonia standard in a portion of Upper South Platte segment 3, below the Florissant Water and Sanitation District wastewater treatment facility. Evidence was presented that the discharger has a compliance problem and there is significant uncertainty regarding whether there are feasible treatment options. This temporary modification will expire on December 31, 2017 and will be reviewed in the December 2015 annual review.

New Site-Specific Standards: The Commission adopted site-specific copper standards based on an investigation of the copper bioavailability of Segment 2 below the Upper Thompson Sanitation District's wastewater treatment plant outfall location that employed the Biotic Ligand Model (BLM) and the Fixed Monitoring Benchmark (FMB) methodologies. The original proposal introduced by UTSD was withdrawn and replaced with a compromise proposal offered by the Division. The compromise addressed some of the Division's technical concerns while UTSD avoided the added cost of preparing for another hearing and greatly reduced uncertainty about facility planning.

Based on a review of actual water chemistry and comparison of BLM results at several stations, the Commission elected to base its decision on analysis of data from Station M50, which is immediately downstream of the WWTP discharge. Stations further downstream showed less sensitivity to copper (higher FMB values), so basing the standard on Station M50 protects the downstream uses.

The data record at Station M50 included 115 sampling events from 2004 through 2014. Copper data did not meet the distributional assumption (lognormal) implicit in the BLM, but some additional processing ("trimming") yielded defensible values.

The BLM/FMB analysis resulted in acute and chronic water quality criteria for copper of 11 µg/L and 7.5 µg/L, respectively, for the portion of segment 2 below the wastewater treatment plant. The Commission anticipates that these standards will be reviewed as a part of the basin hearing in June 2015, and the values may be modified based on additional technical guidance for analysis and interpretation of data supporting use of the BLM.

PARTIES TO THE RULEMAKING HEARING

1. Pioneer Natural Resources USA, Inc. and XTO Energy, Inc.
2. U.S. Energy Corp.
3. Plum Creek Water Reclamation Authority
4. Upper Clear Creek Watershed Association
5. Upper Thompson Sanitation District
6. Colorado Parks and Wildlife
7. U.S. Environmental Protection Agency
8. High Country Conservation Advocates
9. Metro Wastewater Reclamation District
10. Climax Molybdenum Company
11. Rio Grande Silver, Inc.
12. City of Pueblo
13. Tri-State Generation and Transmission, Inc.

14. Centennial Water and Sanitation District
15. Xcel Energy
16. MillerCoors
17. Seneca Coal Company
18. Peabody-Sage Creek Mining, LLC
19. City of Boulder

38.90 STATEMENT OF BASIS, SPECIFIC STATUTORY AUTHORITY AND PURPOSE; JUNE 9, 2015 RULEMAKING; FINAL ACTION AUGUST, 2014; EFFECTIVE DATE DECEMBER 31, 2015

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:

A. Waterbody Segmentation

Some renumbering and/or creation of new segments was made to facilitate appropriate organization of waterbodies in this regulation. Renumbering and/or creation of new segments was made based on information that showed: a) the original reason for segmentation no longer applied; b) differences in water quality; and/or c) certain segments could be merged into one segment because they had similar water quality and uses. The following changes were made:

Upper South Platte River segments 11b and 12: Description of segment 12 expanded to include a portion of Bear Creek formerly in segment 11b to allow for Class 1 protection of Bear Creek.

Upper South Platte River segments 16c and 16k: Lakewood Gulch was removed from segment 16c and moved to new segment 16k to allow for Class 1 protection of Lakewood Gulch.

Cherry Creek segments 4a and 4b: This segment was split into segments 4a and 4b to allow for adoption of ambient based, site specific standards for selenium on segment 4b.

Clear Creek segments 7a and 7b: Segment 7 was split into segments 7a and 7b to separate lakes and streams.

Clear Creek segments 12a and 12b: This segment was split into segments 12a and 12b to allow for Class 1 protection of segment 12b.

Boulder Creek segments 1 and 4a: Description of segment 1 was expanded to include the tributaries and wetlands within the James Peak Wilderness Area which had been in segment 4a.

Boulder Creek segments 13 and 15: Description of lakes segment 13 was expanded to include the lakes within the James Peak Wilderness Area which had been in segment 15.

Boulder Creek segment 15: Gross Reservoir was removed from segment 15 and moved to new segment 18 to allow for Class 1 protection of Gross Reservoir.

Cache la Poudre River segments 10a and 10b: Segment 10 was split at the Larimer County Ditch to allow for Class 1 protection of the portion upstream of the Larimer County Ditch, which is now in new segment 10a. The remaining portion downstream of the Larimer County Ditch was moved to new segment 10b and remained Class 2.

Republican River segments 1, 2 and 8: Segment 2 was deleted and the lakes and reservoirs in this segment were moved to a new segment 9 at the end of the subbasin. This change was reflected in segment 8, which referenced segment 2 and now references segment 9. Bonny Reservoir was removed from the segment 1 description, as recent evidence indicates that the reservoir no longer holds water and is now managed as a state wildlife area.

Segment descriptions were also edited to improve clarity, correct typographical errors, and correct spelling errors. These changes are listed in Section S:

B. Revised Aquatic Life Use Classifications and Standards

Some segments were assigned an Aquatic Life use classification, but were missing one standard to protect that use. The Commission adopted the missing standards for the following segments:

Upper South Platte River segment: 2c (Cd ac)
Clear Creek segments: 11 (Cd trout), 17a and 17b (Ag ch trout)
Boulder Creek segments: 4d (Fe) and 5 (Fe)
Big Thompson River segment: 18 (DO)

The Commission reviewed information regarding the existing aquatic communities. Class 2 segments with high MMI scores or a wide variety of fish species were upgraded from Class 2 to Class 1.

The following segments were upgraded from Cold 2 to Cold 1:

Big Thompson River segment: 4a
Boulder Creek segment: 18 (Gross Reservoir)
Cache la Poudre River segments: 7 and 10a

The following segments were upgraded from Warm 2 to Warm 1:

Big Thompson River segment: 4b
Cache la Poudre River segments: 11 and 12
Republican River segment: 5

The Commission reviewed all Class 2 segments that have fish that are “of a catchable size and which are normally consumed and where there is evidence that fishing takes places on a recurring basis.” Water + fish or fish ingestion standards were applied to the following segments:

Warm Class 2:

Upper South Platte River segment: 16i
Cherry Creek segment: 6
Clear Creek segment: 14b
Boulder Creek segment: 17
St. Vrain Creek segment: 12
Middle South Platte River segments: 1a, 1b, 3a and 4
Big Thompson River segments: 13 and 17
Lower South Platte River segment: 1

C. Recreation Classifications and Standards

The Commission reviewed information regarding the current Recreation use classifications and evidence pertaining to actual or potential primary contact recreation. In addition, newly created segments were given the same Recreation use classification as the segment from which they were split, unless there was

insufficient evidence to support keeping that classification, or evidence to show that the existing use classification was inappropriate.

Based upon evidence that portions of these segments are publicly accessible and/or accessible to families who live in the area or visitors to public recreation lands in these segments, it was determined that there is the potential for primary contact recreation, including water play by children. The following segments with year-round or seasonal Recreation N standards were upgraded to Recreation P:

Lower South Platte River segment: 2a
Republican River segment: 6

Based upon evidence that portions of these segments are publicly accessible and located in a developed area where there is easy access for children, it was determined that primary contact recreation is expected to occur. The following segments with year-round or seasonal Recreation N standards were upgraded to Recreation E:

Clear Creek segments: 16b, 17a and 18b

The following segments with year-round or seasonal Recreation U standards were upgraded to Recreation P:

Lower South Platte River segment: 4

D. Water Supply Use Classification and Standards

The Commission added a Water Supply use classification and standards where the evidence demonstrated a reasonable potential for a hydrological connection between surface water and alluvial wells used for drinking water. The Water Supply use classification and standards were added to the following segments:

Upper South Platte River segments: 7, 11a, and 16j
Cherry Creek segments: 4a and 4b
Clear Creek segment: 5
Boulder Creek segments: 7a and 7b
Middle South Platte River segments: 3a and 5a
Big Thompson River segments: 4b and 9
Lower South Platte River segments: 2a and 3

A review of the segments with an existing Water Supply use classification showed that some segments were missing one or more standards to protect that use. The full suite of Water Supply standards was added to the following segments:

Cherry Creek segment: 5
St. Vrain Creek segment: 5
Big Thompson River segments: 17 and 19
Cache la Poudre segment: 21
Lower South Platte River segments: 4 and 5
Republican River segment: 8

Three segments have one or more numeric standards for water supply, but do not have the Water Supply use classification. The Division searched for alluvial wells on these segments and determined that there is not an existing Water Supply use. Therefore, the Water Supply standards were removed from the following segments:

Clear Creek segment: 13b
Boulder Creek segment: 8
St. Vrain Creek segment: 6

E. Agriculture Use Classification and Standards

A review of the segments with an existing Agriculture use classification showed that some segments were missing one or more standards to protect that use. The full suite of Agriculture standards were added to the following segments:

Clear Creek segments: 13b, 16b, 22 and 25
Big Dry Creek segments: 1 and 3

Molybdenum: In 2010, the Commission adopted a new standard for molybdenum to protect cattle from the effects of molybdenosis. The table value adopted at that time was 300 µg/l, but included an assumption of 48 mg/day of copper supplementation to ameliorate the effects of molybdenosis. State and local experts on cattle nutrition indicated that copper supplementation in the region is common, but is not universal. Therefore, the copper supplementation assumption was removed from the equation, which then yielded a standard of 160 µg/l. That standard was applied in recent basin reviews.

In this hearing, the Commission adopted a standard of 150 µg/L, based on an improved understanding of the dietary- and water-intake rates for various life-stages of cattle. This standard is protective of all life-stages of cattle (including lactating cows and growing heifers, steers and bulls) at all times of year.

The Agriculture table value assumes that the safe copper:molybdenum ratio is 4:1. Food and water intake is based on growing heifers, steers, and bulls consuming 6.7 kg/day of dry matter and 56.8 liters of water per day. Total copper and molybdenum intakes are calculated from the following equations:

$$\text{Cu intake mg/day} = [([\text{Cu}] \text{ forage, mg/kg}) \times (\text{forage intake, kg/day})] + [([\text{Cu}] \text{ water, mg/l}) \times (\text{water intake, L/day})] + (\text{Cu supplementation, mg/day})$$
$$\text{Mo intake mg/day} = [([\text{Mo}] \text{ forage, mg/kg}) \times (\text{forage intake, kg/day})] + [([\text{Mo}] \text{ water, mg/l}) \times (\text{water intake, L/day})] + (\text{Mo supplementation, mg/day})$$

The assumed values for these equations are as follows:

[Cu] forage = 7 mg/kg, [Mo] forage = 0.5 mg/kg, forage intake = 6.7 kg/day, [Cu] water = 0.008 mg/L, [Mo] water = 0.375 mg/L, water intake = 56.8 L/day, Cu supplementation = 0 mg/day, Mo supplementation = 0 mg/day.

A molybdenum standard of 150 µg/l was adopted for all segments in Regulation 38 that have an Agriculture use classification, and where livestock or irrigated forage are present or expected to be present. The following segments do not have an Agriculture or a Water Supply use classification. No molybdenum standard was applied to these segments:

Clear Creek segments: 7a, 7b and 8

The following segments (or portions of segments) have an Agriculture use classification and a Water Supply use, but livestock or irrigated forage are not expected to be present. A molybdenum standard of 210 µg/l was applied to these segments:

Upper South Platte River segment: 22a (McLellan Reservoir)
Clear Creek segments: 4 and 5

Grazing of cattle has recently occurred near Segment 5 (West Clear Creek) on the Buckland property (Guanella Ranch) just west of Empire, CO. However, only limited access exists for cattle to reach West Clear Creek, and discussions between Climax and the property owners have resulted in an agreement to eliminate access and fence cattle out of the creek prior to any future grazing. Because of this agreement, no livestock use of the Segment 5 is expected to occur in the future.

The following segments have an Agriculture use classification and no Water Supply use, but livestock or irrigated forage are not expected to be present. No molybdenum standard was applied to these segments:

Upper South Platte River segment: 16g
Clear Creek segment: 25

F. Changes to Antidegradation Designation

The Commission reviewed all Warm 2 segments designated Use Protected to determine if the Use Protected designation was still warranted. Based upon available water quality data that meet the criteria of 31.8(2)b, the Use Protected designation was removed from the following segment:

Cache la Poudre River segment: 13a

The Commission reviewed all Warm 1 segments designated Use Protected to determine if the Use Protected designation was still warranted. Based upon available water quality data that meet the criteria of 31.8(2)b, the Use Protected designation was removed from the following segment:

Boulder Creek segment: 7a

The Commission reviewed all Reviewable segments to determine if this Antidegradation designation was still warranted. Based upon available water quality data that fails to meet the criteria of 31.8(2)b, the Reviewable designation was removed and replaced with Use Protection in the following segment:

St. Vrain Creek segment: 4a

The following segments with Outstanding Waters designations were expanded to include the James Peak Wilderness Area:

Boulder Creek segments: 1 and 13

G. Ambient Standards

Ambient standards are adopted where natural or irreversible man-induced conditions result in exceedances of table value standards. The Commission reviewed the information that is the basis for these standards, as well as any new information that would indicate whether they are still appropriate, need to be modified, or should be removed.

New ambient-based standards were adopted for the following segments:

Cherry Creek segment 4b: Cottonwood Water and Sanitation District (CWSD) presented evidence in the form of a use attainability analysis (UAA) that the natural and irreversible human-induced ambient selenium concentrations in specific portions of Cottonwood Creek, upper Lone Tree Creek and middle Windmill Creek exceed the relevant table value standard. The UAA established that the highest attainable use in these reaches includes a low rate of fish deformity due to the naturally elevated levels of selenium. The Commission created a new Cherry Creek Segment 4b, defined as "Cottonwood Creek, including all tributaries and wetlands, from the source to Cherry Creek Reservoir" to facilitate the adoption

of site-specific ambient-based selenium standards for specific portions of this small watershed, which are adequate to protect the classified, attainable use.

The Commission specified assessment locations at 38.6(4)(i) to ensure that the sites with water quality currently equal to or better than table value standards are protected. Multiple assessment locations are appropriate because the selenium concentrations decline abruptly and attain TVS standards in the lower reaches of Lone Tree, Cottonwood and Windmill Creeks. These assessment locations act as demarcation of the only portions where the elevated selenium levels are allowable. Where selenium levels are currently naturally elevated, concentrations are significantly higher during the winter months (October through February) and therefore seasonal standards were adopted to recognize the natural seasonal variation of selenium concentrations. While data to characterize summer selenium concentrations were limited on Windmill Creek, seasonal ambient standards were adopted based on evidence of a consistent seasonal selenium pattern observed in adjacent drainages.

It is the Commission's intent that the current natural in-channel processes (e.g., wetlands, infiltration) that remove the selenium are protected, with the intent that lower Cottonwood, Windmill, and Lone Tree Creeks (as defined in the assessment locations) continue to remain in attainment of TVS. The Commission notes that these natural processes that reduce selenium are currently maintained at very low flows. When implementing these standards, the Division shall assure that downstream uses and standards are protected. Evidence within the UAA was limited to selenium and therefore use classifications, anti-degradation designation, and water quality standards from parent segment 4 were applied to new segment 4b.

Although the Commission determined that adoption of the ambient-based selenium standard proposed by CWSD and the Division is appropriate, the Commission believes, without intending to establish or limit permit conditions, that follow-up biological monitoring is warranted to inform future review of the selenium standards. The Commission would expect the collection of additional baseline ("before") fish tissue selenium data in the Cottonwood Creek watershed below CWSD's intended point of discharge, and in Cherry Creek Reservoir. In addition, after the R.O. plant is re-started, the Commission would expect CWSD to collect fish tissue data to support a "before and after" evaluation of downstream effects in the tributaries and reservoir. The sampling should focus on the time of year when sensitive species and species that are high selenium-accumulators are expected to be gravid. This data will be used to evaluate whether the ambient-based standard is protective of the use. The Commission expects CWSD to develop a study plan in agreement with WQCD, CPW, EPA, CCBWQA and other interested parties.

Clear Creek segment 5: The Commission adopted water supply manganese standards representative of existing quality as of January 1, 2000 with assessment locations provided at 38.6(4)(j). The aquatic life manganese standards still apply throughout the segment.

H. Numeric Standards Changes

Changes were made to the following metals criteria to implement revisions adopted by the Commission in the 2010 Basic Standards rulemaking hearing.

Aluminum: Chronic aluminum standards adopted in 2010 are pH-dependent. When the pH is greater than 7.0, the new chronic aluminum standard uses a hardness-based equation. When pH is less than 7.0, the old chronic criterion of 87 µg/l or the new hardness-based equation applies, whichever is more stringent. The new acute aluminum criterion is a hardness-based equation that applies at all pH values. The hardness for both the chronic and acute aluminum hardness-based equations is capped at 220 mg CaCO₃/l, rather than the typical cap of 400 mg CaCO₃/l. The acute and chronic aluminum equations in 38.6(3) were modified to conform to Regulation No. 31.

Ammonia: Footnote 4 was replaced. The equations for the "NH₃=TVS" were deleted and replaced by language that explains the early life stage presence/absence assumptions.

Molybdenum: In 2010, the Commission adopted a new molybdenum standard of 210 µg/L to protect the Water Supply use.

Uranium: The Commission revised the uranium standard in 2010. The new standard is a hyphenated standard with two values (16.8 – 30 µg/L). The first value, which was added in 2010, is a strictly human health-based standard. The second value, which was the old standard, is EPA's maximum contaminant level (MCL), which is higher because it takes into account treatability and detection limits. A new section 38.5(3)(c)(i) was added to explain the hyphenated standard. Subsection 38.5(3)(d) was deleted because it was redundant with 38.5(3)(c).

Zinc: The Commission adopted revisions to the zinc equation in 2010. The new chronic zinc equation is slightly more stringent at hardness values less than 157 mg CaCO₃/l. The new acute zinc equation is slightly less stringent at all hardness values. The zinc(sculpin) equation was not adopted in Regulation No. 38 because sculpin are not expected in the South Platte River basin. The acute and chronic zinc equations in 38.6(3) were modified to conform to Regulation No. 31.

I. Numeric Standards: Biotic Ligand-Based Site-Specific Copper Standards

In the present hearing, the Commission adopted site-specific copper standards based on the Fixed Monitoring Benchmark (FMB) application of the Biotic Ligand Model (BLM). The Commission recognized that implementation guidance is still evolving, but was persuaded that the FMB will now yield criterion-based values that better reflect the toxicity of copper than is possible with the hardness-based TVS or WER-based values. However, there are some important considerations for the acquisition of input data and for the interpretation of output values that warrant attention in future proposals.

The Commission envisions applying the BLM primarily downstream of dischargers where concerns about effluent copper may legitimately be offset to some degree by ligands in the effluent that affect the toxicity of copper. Because the potential "benefit" of these ligands is very much dependent on the mix of effluent with the receiving stream, it is important for the model inputs to provide adequate representation of seasonal and hydrologic variability. Similarly, because water quality conditions change downstream, especially where there are significant hydrologic features (e.g., tributaries and other discharges), it is important to have multiple sites to represent spatial variability and assure downstream protection of uses.

To facilitate future review of the standards adopted in this hearing, the Commission expects proponents to commit to a "longevity plan" with continued monitoring and analysis of BLM parameters culminating in a review at the next basin hearing.

In this hearing, FMB-based copper standards were proposed for four segments in which standards previously had been WER-based:

Upper South Platte River segments 14, 15, and 16g
Middle South Platte River segment 01a.

In addition, the Commission revisited a proposal for Big Thompson segment 2 that received tentative approval at the temporary modifications hearing in December, 2014.

Upper South Platte Segment 15 and Middle South Platte Segment 1a, Below Metro

The Metro Wastewater Reclamation District (Metro) has provided a data set and accompanying analysis that the Commission has determined can be used as a model for future proposals. The multi-year data collection effort included biweekly sampling of all parameters required for the BLM at nine sites, providing complete spatial coverage of the two segments of interest (US15 and MS01a). Comparison of the FMB values across the sites facilitates the selection of one value that is protective in each segment. Addition of confidence intervals shows that the most protective values in each segment are not significantly different; hence, one value can be applied to both segments.

The application of confidence intervals enables future review of the standards adopted in this hearing. The Commission recognizes that the water quality conditions prevailing today may be changed in the future if water management practices or wastewater treatment processes or flows change in the future. Insofar as the FMB is sensitive to parameters like pH or dissolved organic carbon that could change in the future, it is important to review the new standards regularly. Confidence intervals provide a basis for meaningful comparison of new and old determinations of the FMB at the same location.

Metro has agreed to continue all necessary data collection and evaluation activities to support review of the BLM-derived copper standards at the next Regulation No. 38 hearing.

Upper South Platte Segments 14 and 16g, Below Centennial W&SD

Centennial W&SD also applied the BLM to develop a proposal for copper standards. Although the spatial coverage of sites in the initial proposal was very limited, the Division added BLM results from six additional sites in rebuttal. The expanded spatial coverage provided a mutually acceptable proposal for Segment 14 and assured the Commission that the standard would be protective of the affected portion of that segment. The Commission will review these FMB-based standards in the next Basin Review Hearing, using data collected over the next five years, to ensure that FMB-based standards capture any changes in water quality. Centennial has agreed to continue all necessary data collection and evaluation activities to support review of the BLM-derived copper standards at the next Regulation No. 38 hearing.

Big Thompson Segment 2, Below Upper Thompson Sanitation District

The modeling that was done to support the Commission's action in December 2014 was reviewed in light of the experience gained from work in this hearing with the BLM and FMB. The Commission found that the decisions made in the earlier hearing were consistent with the current work and supported by data and analysis.

Cherry Creek Segment 1, Below Parker Water and Sanitation District

Parker Water and Sanitation District (Parker) presented effluent data indicating that they have a predicted compliance problem with permit limits based on the copper hardness equation on Cherry Creek segment 1. Parker has initiated sampling for parameters required to use the BLM to derive a site-specific standard for copper. Robust derivation of site specific copper standards using the BLM requires temporal coverage of at least 2 years of monthly sampling at sites representative of the segment under consideration. As of this hearing, Parker did not have sufficient temporal coverage to use the model. Additionally, information presented in Parker's prehearing statements highlighted recent and future plant process changes which may influence the representativeness of recent sampling. Parker has agreed to continue sampling for 24 months following the last planned operational changes so a more representative dataset can be utilized to derive a site-specific standard for copper with confidence. Given the uncertainty about the appropriate underlying standard, and the predicted compliance problem, the Commission approved a temporary modification for copper set to "current conditions" with an expiration date of 12/31/2020.

J. Numeric Standards: Site-Specific Mercury Standard

The Commission adopted a site-specific total mercury standard of 0.026 µg/L as a chronic, 30-day average standard with a 1-in-3 year exceedance frequency on a portion of Upper South Platte Segment 16i, from Brighton Boulevard to the confluence with the South Platte River. The table value standard of 0.01 µg/L remains the standard for this segment upstream of Brighton Boulevard.

Suncor collected total mercury fish tissue data and unfiltered water samples for total mercury and methylmercury analysis from two sites on Sand Creek between Brighton Boulevard and the Burlington Ditch. Suncor targeted the highest trophic level species in Sand Creek for mercury sampling and collected skinless filets from the largest individuals of each species to analyze for wet-weight total mercury.

Fish tissue bioaccumulation factors (BAFs) were calculated, in part, following EPA's 2010 *Guidance for Implementing the January 2001 Methylmercury Water Quality Criterion*. The calculations also follow recommendations from a 2013 study (Riva-Murray et al.) conducted by the U.S. Geological Survey (USGS) and the U.S. EPA National Exposure Research Laboratory to optimize stream water mercury sampling for the purpose of developing mercury fish tissue BAFs. The site-specific standard was derived using the following equations:

Site-specific BAF (L/kg) = [arithmetic mean mercury fish tissue concentration in mg/kg wet weight] / [85th percentile methylmercury water concentration in mg/L]

Methylmercury water quality criterion (µg/L) = 10^{-9} x [0.3 mg/kg fish tissue] / [site-specific BAF (L/kg)]

Total mercury water quality criterion (µg/L) = methylmercury criterion * median ratio of total Hg:MeHg

A site-specific BAF was calculated for each species. The methylmercury water quality criterion was calculated using only the species with the highest BAF (*Lepomis cyanellus*, green sunfish) rather than a weighted average of all larger species. While the green sunfish are less than five inches in length and unlikely to be consumed, this ensures that the site-specific standard will prevent average fish tissue concentrations from exceeding 0.3 mg/kg for all species. The median ratio of total mercury to methylmercury was calculated in order to translate the protective methylmercury water column value to a total mercury water column standard. Although methylmercury is the form of mercury that bioaccumulates, the standard is based upon total mercury, because mercury can change forms in the environment.

Existing quality for this chronic standard is defined as the 85th percentile for permitting and assessment purposes. Attainment of the standard shall be assessed by comparing the weighted 85th percentile total mercury concentration from both assessment locations at 38.6(4)(f) to the site-specific criterion.

Fish tissue concentrations in the South Platte River are expected to be protected despite the increase in the site-specific standard on Sand Creek. This is due to the low concentrations of mercury previously found in fish flesh in the South Platte River during a time when the mercury concentrations from Sand Creek were much higher. When the relatively small volume of water in Sand Creek and higher mercury concentrations are combined with the greater volume of water in the South Platte River and low ambient water column concentrations, the change in concentration downstream of the confluence is negligible. Based on permitted low flow conditions, the projected mercury concentrations in the South Platte River would attain the existing 0.01 µg/L standard even when mercury concentrations in Sand Creek were as high as 0.053 µg/L (approximately two times the adopted standard in segment 16i).

K. Temporary Modifications

All existing Temporary Modifications were examined to determine if they should be allowed to expire or if they should be extended, either unchanged or with changes to the numeric limits. Temporary modification of copper standards for Cherry Creek segment 1 is discussed above (section I). Temporary modification temperature standards are discussed below in section M.

The Commission deleted or allowed to expire on 12/31/2015 certain temporary modifications on the following segments:

Upper South Platte River segments: 14, 15, 16g and 16i
Clear Creek segments: 9a, 11, 14a, 14b and 15
Boulder Creek segment: 9
St. Vrain Creek segments: 2b and 6
Middle South Platte River segments: 1a and 4
Big Thompson River segments: 2 and 5

Cache la Poudre River segments: 11 and 12
Lower South Platte River segment: 1

The Commission revised or extended Temporary Modification on the following segments:

Bear Creek segment: 1c
Clear Creek segment: 2c, 13b
Boulder Creek segment: 8
Big Thompson River segments: 4b and 9
Cache la Poudre River segment: 13b

To remain consistent with the Commission's decisions regarding arsenic in section 38.85, all existing temporary modifications for arsenic of "As(ch)=hybrid" (expiration date of 12/31/21) were retained. An arsenic temporary modification was added to the following segments, which had an existing or newly added chronic arsenic standard 0.02 µg/L and a permitted discharger with a water quality-based effluent limit compliance problem:

Upper South Platte River segments: 2c and 22a
Bear Creek segments: 1b, 4a, 5, 6b and 11
Clear Creek segment: 5, 9a, 11 and 14b
Boulder Creek segments: 3, 4b and 7a
St. Vrain Creek segments: 2b and 7
Middle South Platte River segments: 1a, 3a and 4
Big Thompson River segments: 3, 4a and 4b
Cache la Poudre River segment: 10b
Lower South Platte River segment: 1

The Commission adopted Temporary Modifications on the following segments:

Upper South Platte River segments: 10a, 14 and 15
Cherry Creek segment: 1
Clear Creek segments: 2c, 7a, 7b and 11
Boulder Creek segment: 9

Upper South Platte segment 10a: The Commission adopted a temporary modification for manganese in segment 10a of the Upper South Platte River. PCWRA presented information that shows a demonstrated water quality based effluent compliance problem. The Commission reviewed the temporary modification implementation plan submitted by PCWRA. Based on that plan, along with the compliance problem and uncertainty regarding the standard, the Commission adopted a "Current Conditions" temporary modification to the manganese standard in Upper South Platte segment 10a with an expiration date of 6/30/2019.

Upper South Platte segment 14: The Commission adopted a temporary modification for chloride in segment 14 of the Upper South Platte River. Centennial presented information that shows a predicted water quality based effluent limit compliance problem. The Commission reviewed the temporary modification implementation plan submitted by Centennial. Based on that plan, along with the compliance problem and uncertainty regarding the standard the Commission adopted a "Current Conditions" temporary modification to the chloride standard in Upper South Platte segment 14 with an expiration date of 12/31/2020.

Upper South Platte segment 15: The Commission adopted a temporary modification for chloride and sulfate in Segment 15 of the Upper South Platte River. Public Service Company presented information that shows a predicted water quality based effluent limit compliance problem. The Commission reviewed the temporary modification implementation plan submitted by Public Service Company. Based on that plan, along with the compliance problems and uncertainty regarding the standards the Commission

adopted a “Current Conditions” temporary modification to the chloride and sulfate standards in Upper South Platte segment 15 with an expiration date of 12/31/2020.

Clear Creek segment 2c: The Commission adopted a new temporary modification for cadmium and revised the temporary modification for copper both with an expiration date of 7/01/2020. Evidence submitted by the CCCSD identifies that it would continue to have a permit compliance problem if ambient quality was implemented in its discharge permit. During the effective period of this temporary modification, copper and cadmium limits for existing dischargers to Segment 2c will be authorized to continue based on past facility performance (existing effluent quality) unless a more stringent limitation is reasonably achievable without requiring significant investment in facility infrastructure, consistent with Regulation 31.14(16).

Big Thompson segment 9: Little Thompson River, Big Thompson Segment 9: The Division’s noticed proposal for this segment originally included a “current conditions” temporary modification as a result of the basin wide practice of extending selenium temporary modifications on segments that continue to indicate impairment. The Town of Milliken presented evidence of a compliance problem with the permit limits based on the underlying selenium table value standard as well as evidence that elevated selenium levels originate from naturally occurring, selenium rich shale and also proposed the same changes. In order to ensure that the current condition in segment 9 is protected over the duration of the temporary modification, the Division changed its proposal to reflect existing quality in the form of a numeric temporary modification. Ambient selenium conditions at a long term monitoring site above the outfall indicate the 85th percentile of selenium concentrations equal 12.3 µg/l. Therefore, the Commission extended the expiration date of the temporary modification to 12/31/2020 and changed the numeric value in the temporary modification for selenium from 13.1 µg/l to 12.3 µg/l to reflect the addition of more recent data. It is the Commission’s intent that no assimilative capacity is created through this action.

The Town of Milliken has volunteered to complete a phased plan to evaluate potential selenium impacts to fish populations within the segment. Milliken will develop a detailed sampling and analysis plan for the first phase in coordination with a qualified consultant and CPW by 7/15/2015. Sampling will commence as soon as technically practicable in 2015 and will first focus on fish tissue selenium analysis of ovaries/eggs of larger female fish, and muscle or whole body analysis for other fish. Milliken’s commitment to follow-up phases is contingent on Milliken’s continued intent to utilize their existing surface water discharge permit. If necessary, and after coordination between CDPHE, Milliken, and CPW, a second phase of the study will be to evaluate larval fish deformity rates and/or selenium bioaccumulation through the foodchain. Results of this analysis will be presented at a future Temporary Modifications Rulemaking Hearing in 2018 or 2019 or before. If the results demonstrate that uses are protected, an ambient-based site-specific standard may be appropriate.

L. Temperature Standards

The Commission adopted new criteria for temperature in 2007. In June 2009, segment-specific temperature standards were adopted by the Commission for all segments with an Aquatic Life use classification in the South Platte River basin.

In June 2010, revisions of the temperature criteria in Regulation No. 31 resulted in changes to warm stream temperature tiers. The expected range of the razorback sucker is also habitat for the more thermally sensitive white sucker. Because the temperature tier applied to a segment is based on the most thermally sensitive species, the razorback sucker tier had never been applied. Therefore, the Commission deleted the razorback sucker tier (warm stream tier III), and included the razorback sucker in warm stream tier II. In implementation of these changes, the Commission changed all warm stream tier IV segments to warm stream tier III to conform with the 2010 revisions, which affected the following segments:

Upper South Platte River segments: 16d, 16e and 16f
Middle South Platte River segments: 3b, 5b and 6
Republican River segment: 7

In 2010, the Commission also reformatted the temperature criteria in 31.16 Table I and updated the values based on new data included in the Colorado Temperature Database. Several corrections were made to the temperature criteria. Both the Arctic grayling and golden shiner were moved from stream tiers to the cold and warm lake tiers, respectively, because both species are found only in lakes. Additionally, a typographical error in the chronic temperature criterion for cold stream tier II and large lakes and reservoirs was corrected.

Changes were made to bring Regulation No. 38 into conformity with all of the 2010 revisions to the Basic Standards for temperature, including updating the temperature tables at 38.6(3).

Based upon new information on the species expected to occur, the Commission changed the temperature standard from CS-II to CS-I for the following segments:

Clear Creek segment: 12b

Ambient temperature standards for lakes

In the 2009 triennial review, the WAT standard was found to be unattainable for a number of cold large lakes and reservoirs with apparently healthy cold-water fish populations. Because summertime temperature in the mixed layer for large lakes and reservoirs is very well correlated to the waterbody's elevation, the Commission adopted ambient temperature standards for large lakes wherever data were available to characterize a WAT and the thermal characteristics of the lakes and reservoirs were determined to be the result of natural or irreversible man-induced conditions.

However, the 2010 revisions to the dissolved oxygen criteria in Regulation No. 31 altered how lakes and reservoirs are assessed for temperature and dissolved oxygen. The Commission decided that dissolved oxygen may be less than the applicable standard in the lower portion of a lake or reservoir except where Regulation No. 31 footnote 5(c)(iii) applies or a site-specific standard has been adopted.

Footnote 5(c)(iii) states:

When a lake or reservoir is stratified, the mixed layer may exceed the criteria in Table 1 provided that an adequate refuge exists in water below the mixed layer. Adequate refuge depends on concurrent attainment of applicable dissolved oxygen standards. If the refuge is not adequate because of dissolved oxygen levels, the lake or reservoir may be included on the 303(d) List as "impaired" for dissolved oxygen, rather than for temperature.

Therefore, the ambient standards adopted by the Commission in 2009, which were based solely on the WAT and did not account for the concept of refuge, may no longer be appropriate or protective of the aquatic life use. To ensure that adequate refuge is defined in a way that protects the Aquatic Life use, the Commission adopted Footnote D which was applied to the temperature standard for deep stratified lakes. Footnote D states "Assessment of adequate refuge shall rely on the Cold Large Lake table value temperature criterion and applicable dissolved oxygen standard rather than the site-specific temperature standard", and was applied to following lake segments:

Upper South Platte River segment: 19 (Eleven Mile Reservoir)

Boulder Creek segment: 18 (Gross Reservoir)

Big Thompson River segment: 11 (Carter Lake)

Cache la Poudre River segment: 14 (Horsetooth Reservoir)

M. Temperature Temporary Modifications

At the basin hearing in 2009 and in subsequent hearings, concerns have been registered about the implementation of temperature standards. In particular, major POTWs discharging to streams with an

Aquatic Life Warm classification have expressed reservations about the technical basis for winter standards and concerns about compliance prospects.

These concerns have occupied much of the Commission's time at this hearing and are likely to do so again at the Basic Standards hearing next year. Although the issues cannot be resolved completely today, the Commission has taken two actions that will provide some guidance for future actions. The first is to adopt temporary modifications in a way that acknowledges compliance problems common to most dischargers to warm streams, and the second is to comment on what has been learned about resolving temperature problems.

Temporary modifications have been adopted for all segments with an Aquatic Life Warm classification where a discharger has shown a compliance problem. The temporary modifications are restricted for most segments, to the winter season (December-February). The exception is for Cache la Poudre segment 12, where the Commission decided, for reasons explained below, that it was appropriate to adopt a temporary modification for the full year rather than just the winter months. Year-round temporary modifications were also adopted for Upper South Platte segment 15 and Clear Creek segments 11, 14a, 14b, and 15, where work is underway on discharger specific variance proposals. Most of these temporary modifications will be in effect through 12/31/2020, which is synchronized with the next South Platte basin hearing.

The Commission is aware that not all parties are satisfied with temporary modifications at this time. In particular, Littleton/Englewood put considerable effort into development of a site-specific proposal that was not adopted. Consequently, it may be helpful for the Commission to comment again on possible approaches to resolving temperature issues.

At the last South Platte basin hearing in 2009 (see 38.74(M)), temporary modifications and site-specific standards were adopted in some of the same segments that were considered at the present hearing. Specifically with respect to Upper South Platte segments 14, 15, and 16g, the Commission stated its expectation that "domestic wastewater facilities will, in cooperation with other dischargers and the Division, explore options for developing new underlying site-specific temperature standards including refined numeric site-specific standards, ambient-based site-specific standard and narrative site-specific standards although permit implementation strategies are not yet fully developed for all of these." In addition, the Commission commented on a "facility-specific variance approach ... [that] may be an appropriate solution...." It is apparent now that the facilities in question have worked largely independently and have relied on different approaches.

In the years following adoption of temperature criteria, interested parties have amassed temperature data from many segments in the South Platte basin. The extensive records of spatial and temporal temperature patterns have done much to inform the Commission about the influence of POTW discharges on stream temperature. In warm streams, a large discharge can increase stream temperature as much as 10 degrees C in the winter, but may cause relatively little change in the summer. This potential compliance problem occurs primarily in the winter months.

The options for addressing temperature issues remain essentially the same now as they were in 2009, except that the "facility-specific variance" (now the DSV) is officially available. What has changed is that there is now a more complete appreciation of the level of difficulty for developing a successful proposal. Development of a site-specific standard (criterion or ambient; numeric or narrative) is a challenging undertaking that is hampered by the paucity of scientific information regarding wintertime thermal requirements of warm water fish communities. The challenge is compounded by having to determine which species are expected to occur in the fish community. These are not new difficulties and they will continue to confront future efforts.

The record in this hearing included expressions of concerns about the implementation of temperature standards, the feasibility of meeting temperature standards, and the scientific basis for the warm-water winter temperature standards. These concerns involve multiple aspects of the State's clean water program, including standards, permitting, and engineering. The Commission supports the use of Division

resources across multiple units to address uncertainties about the temperature standards and their implementation.

From the Commission's perspective, it is important to see a showing that a proposed change to a temperature standard will protect the use. The bar for demonstrating protectiveness of temperature standards was set high in previous hearings and documents, and it has not changed. In adopting changes to temperature regulations in 2007 (see 31.45), the Commission broadened provisions protecting spawning to "ensure that the thermal requirements for successful migration, spawning, egg incubation, fry rearing and other reproductive functions are met". The Commission specifically linked winter criteria to protection of reproductive functions.

While the Commission understands that the absence of formal guidance may make the development of a standard more difficult, it does not absolve the proponent of the responsibility to show that the proposed standard will meet the intent of the regulation. Proposals submitted to date have encountered stiff challenges from the Division, EPA and CPW largely on the question of protectiveness. The alternative to developing a new use-based standard, which was suggested as early as 2007, would be to seek a variance (DSV). A DSV, perhaps sector-based, would provide the foundation for reasonable incremental progress to reduce winter heat load to streams without imposing an unachievable compliance schedule.

1. Warm Stream Temporary Modifications:

Littleton/Englewood (L/E), South Platte segment 14: L/E has proposed relaxing the temperature standards in December and February in Segment 14. The proposal is based largely on field studies and relies on this evidence to show that one of the temperature-sensitive species – the Johnny darter – is not suffering adverse effects from increased winter temperatures downstream of the outfall. The proposal failed because there was no showing that the proposed standards would be protective, specifically, L/E has not demonstrated that the proposed standards would protect all life stages including reproduction and early life stages. Field studies are generally insufficient because the effects of confounding factors are not addressed adequately. Site-specific criteria are generally based on controlled studies in the laboratory.

Instead, the Commission accepts the Division's proposal that a temporary modification is appropriate at this time. It affords L/E, and other parties with similar issues, the opportunity to work together to find a path forward either in the Basic Standards hearing proceedings or through the collective work that is now proceeding on the feasibility of treatment (cooling) options.

PCWRA, Centennial, Boulder, Ft Collins, multiple segments: Plum Creek Water Reclamation Authority (Upper South Platte segment 10a) Centennial (Upper South Platte segments 16g and 14), Boulder (Boulder Creek segment 9, and Fort Collins (Cache La Poudre segment 11) all proposed solutions for winter temperature effluent limit compliance problems. The Commission agrees that there are concerns about compliance with temperature limits that are common to several parties to this hearing. In Warm streams, dischargers are likely to experience compliance problems in the winter (Dec-Feb). Winter is also the season in which thermal requirements are poorly known for species expected to occur in Warm streams. The combination of compliance problems and uncertainty about the underlying standards is a necessary condition for a temporary modification.

It is the Commission's hope that workgroup efforts prior to the Basic Standards hearing will help resolve uncertainty about the winter temperature standards. However, even if a better technical basis emerges from that hearing, there is no guarantee that it will resolve all of the compliance problems expected by many of the dischargers. Consequently, the Commission encourages all parties to consider what progress can be made regarding the scope of an alternatives analysis that might support a DSV.

Greeley, Cache la Poudre segment 12: The standards in this segment affect several dischargers, two of which participated in the present hearing. Consequently, the Commission

lacks a complete picture of temperature patterns and potential problems. The City of Greeley, which discharges near the downstream end of Segment 12, predicts compliance problems in the summer, but not in the winter. The compliance problems may be associated in part with times when ambient temperatures exceed the standard.

Temperature data on the record are not adequate to determine if ambient temperatures are elevated throughout Segment 12 or only at the downstream end. The City of Fort Collins submitted data for a site at the downstream end of adjacent Segment 11, which does not show the same attainment problem. There is uncertainty about the underlying standard in Segment 12, and resolution of that uncertainty likely will affect other dischargers (e.g., Windsor and Carestream). Resolution, if it results in an ambient standard for all or part of Segment 12, may also reduce the likelihood of compliance problems for Greeley.

Greeley has adequate justification for a temporary modification in the summer, but has no compliance problem in the winter. Regarding the potential for compliance problems in the winter, the Commission believes that the evidence from other segments, including Cache La Poudre Segment 11, is sufficiently compelling to justify a temporary modification for the winter months. Permit limits for the discharger at the downstream end of Segment 11 (Ft Collins Drake) may be affected by proximity to Segment 12. In addition, the Windsor and Carestream facilities would seem likely to have winter compliance problems, although the evidence is not currently on the record.

Metro, Upper South Platte segment 15: In this hearing the Commission extended the expiration date for the temperature temporary modification on Upper South Platte segment 15. The temporary modification, set at current conditions, will expire on 12/31/2020. The Metro District will continue to refine a temperature discharger-specific variance proposal for the Robert W. Hite Treatment Facility with input from the Division, Colorado Parks and Wildlife, U.S. EPA Region 8, and South Adams County Water and Sanitation District for future consideration by the Commission.

MillerCoors, Clear Creek segments 11, 14a, 14b, 15: The Commission extended the “current conditions” temporary modifications for temperature until June 30, 2019 for Segments 14a, 14b and 15 and adopted a new temporary modification for temperature on Segment 11 from a point immediately downstream of the 6th Avenue Bridge to the Farmers Highline Canal diversion, also with a June 30, 2019 expiration date. MillerCoors has shown that there is uncertainty about whether a discharger-specific variance may be appropriate and will complete an alternatives analysis with input from the Division, U.S. EPA Region 8 and other interested stakeholders to address the uncertainty.

2. Cold Stream Temporary Modifications:

Black Hawk Central City, Clear Creek segment 13b: The Commission extended the expiration date for the temperature temporary modification for Segment 13b. The temporary modification, set at current condition, will now expire on December 31, 2020. BHCCSD and Black Hawk provided temperature data demonstrating a predicted compliance issue year-round. In addition, there remains uncertainty regarding the appropriate temperature standard for Segment 13b; while aquatic life is currently limited by poor water quality and habitat, water quality conditions are expected to improve. The EPA and Colorado Hazardous Materials Waste Management Division plan to construct a water treatment plant in the upper portion of Segment 13b that will remove metals from the Gregory Incline, Gregory Gulch ground water, and the National Tunnel; extension of the temporary modification will allow time for BHCCSD and Black Hawk to evaluate the effects of improved water quality on aquatic life in Segment 13b following water treatment plant construction and determine the appropriate temperature standards for Segment 13b.

BHCCSD and Black Hawk submitted an outline of a plan to collect additional temperature data from existing sites and other sites in Segment 13b to better characterize the longitudinal

temperature variability of the stream. During the summer of 2015, BHCCSD and Black Hawk will also conduct side by side temperature measurements in the stream to verify the accuracy of temperature measurements that have been collected to-date. BHCCSD and Black Hawk also plan to review water quality data collected by UCCWA. BHCCSD and Black Hawk will continue to collect benthic macroinvertebrate data and will coordinate with CPW to collect additional fish population data to better characterize the species and life stages expected to be present in Segment 13b. Additionally, BHCCSD and Black Hawk initiated a discussion with UCCWA at its May 2015 meeting regarding riparian restoration potential within Segment 13b, and will continue the dialogue during the period of the temporary modification. An UCCWA agenda item will be scheduled for the fall of 2015. BHCCSD and Black Hawk will also evaluate whether a discharger specific variance would be consistent with 31.7(4). The Commission expects that BHCCSD and Black Hawk will work with the Division and CPW to develop the detailed plan within the next year. At the December 2018 temporary modification review hearing, the Commission will consider extending the duration of the temporary modification if more time is needed to evaluate the recovery of the aquatic life community and determine the appropriate temperature standards, or if other delays occur, particularly related to construction of the water treatment plant

Climax, Clear Creek segments 7a and 7b: The Commission adopted a new temporary modification of the temperature standard for these segments of “current conditions” for the months of October, November, April, and May. The Commission recognizes that there is uncertainty about the appropriate temperature standard because of recent channel improvements done by Climax Molybdenum Company in Woods Creek between Upper Urad Reservoir and Lower Urad Reservoir in 2012-2015. It is uncertain whether and how the channel improvements will affect in-stream temperatures or whether sensitive life stages of cold water fish will be expected to be present in the short reach of restored surface channel downstream of the Henderson water treatment facility outfall on Woods Creek.

The Commission adopted the temporary modifications with an expiration date of June 30, 2023. Climax will delay site-specific studies in Woods Creek, to allow Climax to complete construction and establish operational practices for water management and control of the new channels, and evaluate conditions in the channels including possible establishment of aquatic life in the channels. Conditions may change once the new channel stabilizes; therefore, an extended temporary modification duration is appropriate. The Commission will review progress on the study plan at the 2019 Issues Formulation Hearing for the South Platte Basin.

N. Nutrients

In March 2012, the Commission adopted interim nutrient values in the Basic Standards (Regulation No. 31) and created a new statewide control regulation (Regulation No. 85) to address nutrients in Colorado. Regulation 31.17 includes interim nutrient values for total phosphorus, total nitrogen, and chlorophyll *a* for both lakes and reservoirs, and rivers and streams. Due to the phased implementation approach adopted with these criteria (31.17(e)), the Commission adopted only total phosphorus and chlorophyll *a* standards at this time. Nitrogen standards were not considered as part of this rulemaking hearing, but will be considered in the next triennial review, currently scheduled for June 2020.

Total phosphorus and chlorophyll *a* standards were adopted for waters upstream of all permitted domestic wastewater treatment facilities discharging prior to May 31, 2012 or with preliminary effluent limits requested prior to May 31, 2012, and any non-domestic facilities subject to Regulation No. 85 effluent limits and discharging prior to May 31, 2012. A new section (4) was added at 38.5 describing implementation of the interim nutrient values into the tables at 38.6, and includes a table which lists these facilities and the segment to which they discharge.

For segments located entirely above these facilities, nutrient standards apply to the entire segment.

For segments with portions downstream of these facilities, *nutrient standards only apply above these facilities*. A footnote “C” was added to the total phosphorus and chlorophyll *a* standards in these segments. The footnote references the table of qualified facilities at 38.5(4).

For segments located entirely below these facilities, nutrient standards do not apply.

For rivers and streams segments, total phosphorus standards were adopted for segments with an aquatic life use. Chlorophyll *a* standards were adopted for segments with either an E or P recreation use classification.

For lakes and reservoirs segments, a Footnote B was added to total phosphorus and chlorophyll standards adopted for lakes in the tables at 38.6, as these standards only apply to lakes larger than 25 acres.

31.17(e)(iii) also allows the Commission to adopt numeric nutrient standards for Direct Use Water Supply (DUWS) lakes and reservoirs. No proposals were made to adopt standards based on this provision in this rulemaking (see section O).

31.17(e)(iii) also allows the Commission to adopt numeric nutrient standards for circumstances where the provisions of Regulation No. 85 are not adequate to protect waters from existing or potential nutrient pollution. No proposals were made to adopt standards based on this provision in this rulemaking.

Chlorophyll *a* standards were adopted for the following segments:

Upper South Platte River segments: 1a, 1b, 2a, 2c, 3, 4, 5a, 5b, 7, 8, 9, 10a, 11a, 11b, 12, 13, 16c, 16d, 16f, 16h, 16i, 16j, 16k, 18 and 19
Cherry Creek segments: 1, 4a, 4b and 5
Bear Creek segments: 1a, 3, 5, 6a, 7, 8 and 9
Clear Creek segments: 1, 2a, 2b, 2c, 3a, 3b, 4, 5, 6, 9a, 9b, 10, 13a, 13b, 16a, 16b, 17a, 17b, 18a, 18b, 19, 20, 21, 22 and 24
Boulder Creek segments: 1, 2a, 2b, 3, 4a, 4b, 4c, 4d, 6, 7a, 8, 13, 14, 15 and 18
St. Vrain Creek segments: 1, 2a, 2b, 4a, 4b, 4c, 5 and 10
Middle South Platte River segments: 3a and 3b
Big Thompson River segments: 1, 2, 6, 7, 8, 9 and 10
Cache la Poudre River segments: 1, 2a, 2b, 6, 8, 9, 13a, 13b, 13c, 16, 18, 19, 20 and 21
Laramie River segments: 2a, 3 and 4
Lower South Platte River segments: 2a, 2b, 3, 4 and 5
Republican River segments: 3, 4, 5, 6 and 9

Total Phosphorus standards were adopted for the following segments:

Upper South Platte River segments: 1a, 1b, 2a, 2c, 3, 4, 5a, 5b, 7, 8, 9, 10a, 11a, 11b, 12, 13, 16c, 16d, 16f, 16h, 16i, 16j, 16k, 18 and 19
Cherry Creek segments: 1, 4a, 4b and 5
Bear Creek segments: 1a, 3, 5, 6a, 7, 8, and 9
Clear Creek segments: 1, 2a, 2b, 2c, 3a, 3b, 4, 5, 6, 7a, 9a, 9b, 10, 12, 13a, 13b, 16a, 16b, 17a, 7b, 18a, 18b, 19, 20, 21, 22, 23, 24 and 25
Boulder Creek segments: 1, 2a, 2b, 3, 4a, 4b, 4c, 4d, 6, 7a, 8, 13, 14, 15 and 18
St. Vrain Creek segments: 1, 2a, 2b, 4a, 4b, 4c, 5 and 10
Middle South Platte River segments: 3a, 3b, 5a, 5c and 6
Big Thompson River segments: 1, 2, 6, 7, 8, 9 and 10
Cache la Poudre River segments: 1, 2a, 2b, 6, 8, 9, 13a, 13b, 13c, 16, 18, 19, 20 and 21
Laramie River segments: 2a, 3 and 4
Lower South Platte River segments: 2a, 2b, 3, 4 and 5
Republican River segments: 3, 4, 5, 6, 7 and 9

Big Dry Creek Segment 1: Total phosphorus and chlorophyll-a standards do not apply to the mainstem of Big Dry Creek downstream of Standley Lake, because Standley Lake is filled by ditches that withdraw water downstream of multiple permitted domestic wastewater treatment facilities.

1. Site-Specific Total Phosphorus Standards

The Commission continues to support a phased implementation approach to adoption of nutrient criteria. However, it is also clear from evidence on the record that some segments merit special consideration. The Cherry Creek Basin Water Quality Authority (CCBWQA) submitted data in its responsive statement showing that background phosphorus levels exceed TVS. The Division concurs with this finding, which also has been documented in previous hearings related to Watershed Control Regulation No. 72. A background concentration has been established to support estimation of phosphorus loads to Cherry Creek Reservoir, but it is not yet known if that concentration should be applied uniformly as a stream standard throughout the basin.

A similar situation, albeit with less supporting evidence, has been identified by the Bear Creek Watershed Association (BCWA) in Bear Creek Segment 7. In this case, the evidence suggests that fen wetlands have background phosphorus levels that exceed TVS even though streams in the same segment do not have elevated phosphorus levels. It is not yet known what background level would be appropriate or if it varies among the fens.

The Commission applauds the efforts of CCBWQA and BCWA to obtain, and make available for this hearing, data that improve our understanding of existing conditions within each basin. Site-specific standards are needed for all, or part, of the segments for which phosphorus standards have been proposed, but there is uncertainty about the habitat type or the geographic scope of applicability for site-specific standards (or conversely for the TVS). Resolving the uncertainty will require additional sampling to obtain representative data. A temporary modification cannot be used to provide the additional time because adoption of the phosphorus standard, as proposed in this hearing, would not result in a compliance problem for a discharger. However, delaying the effective date by five years would give CCBWQA, BCWA, and/or any other interested party or parties time to collect additional data and propose site-specific phosphorus standards as appropriate.

Total Phosphorus standards were given a delayed effective date of 12/31/2020 in the following segments:

Cherry Creek Segments 1, 4a and 4b
Bear Creek Segment 7 (wetland fens)

2. Bear Creek Reservoir Total Phosphorus and Chlorophyll a Standards

The site-specific standards for chlorophyll a and total phosphorus have been revised in response to US EPA's disapproval of the Commission's 2009 action. The purpose for the revised standards remains consistent with the Commission's original goal of shifting the trophic condition to the mesotrophic-eutrophic boundary. The numeric values for chlorophyll and phosphorus have changed because the data set has been expanded by several years and an improved methodology has been applied. As before, the standards were developed using only data from Bear Creek Reservoir. Each standard is defined for average summer concentrations and has an allowable exceedance frequency of once in five years.

- A. Chlorophyll Standard: The Commission revised the chlorophyll standard to 12.2 µg/L. If summer average chlorophyll concentrations in the reservoir exceed 12.2 µg/L more than once in five years, it would be firm evidence that the trophic condition goal of the pre-existing narrative (mesotrophic-eutrophic boundary) was not being met. The exceedance threshold of 12.2 µg/L was derived with a "translator" developed with data from Bear Creek Reservoir. The translator connects the concentration at the allowable exceedance

frequency (once in five years) to the typical concentration at the mesotrophic-eutrophic boundary (8 µg/L).

- B. Phosphorus Standard: The Commission revised the phosphorus standard to 22.2 µg/L. The standard is calculated in two steps based on the methodology used to develop statewide nutrient criteria for the 2012 Nutrient hearing. The first step involves the creation of a statistical “linkage” between phosphorus and chlorophyll based on summer average concentrations measured in Bear Creek Reservoir. The linkage is used to define the phosphorus concentration corresponding to the mesotrophic-eutrophic boundary in this reservoir; that concentration is 16 µg/L. The second step involves a translator for phosphorus that performs the same function described for the chlorophyll translator described above. The concentration at the exceedance threshold is 22.2 µg/L.
- C. Assessment: The phosphorus and chlorophyll standards are defined as seasonal averages. Samples are to be collected at a site in deep water near the dam and should be representative of conditions in the mixed layer. Past monitoring has resulted in 5 or 6 samples during the summer months (July, August, and September); it is anticipated that the same level of effort will be applied in the future. For assessment, the average (arithmetic mean) is calculated for the summer samples in each year.
- D. Independent Applicability: The chlorophyll and phosphorus standards are considered independently applicable. That is, impairment can be determined with either parameter without confirmation by the other parameter. Although the parameters are linked biologically – algae require phosphorus to grow – the linkage is “noisy” in a statistical sense because phosphorus cannot compel algae to grow (i.e., other limiting factors complicate the relationship). Independent applicability establishes a more sensitive basis for assessing departures from the target trophic condition since regulation of phosphorus cannot be used to guarantee attainment of the chlorophyll standard. Independent applicability is a practical way to adapt regulation to a complex natural relationship where neither constituent is toxic (at least not at the target levels).
- E. Adoption of a Temporary Modification for Chlorophyll and Phosphorus: The underlying standards are not attained presently due to the seasonal augmentation of phosphorus concentrations from internal sources. A temporary modification set at “current conditions” to expire 12/31/2020, is adopted in order to recognize the uncertainty regarding how soon the internal load will be reduced. The Division, in conjunction with the Bear Creek Watershed Association, is working on studies to determine what management strategies might be feasible for reducing or controlling internal phosphorus release. Progress on resolving uncertainty will be reviewed in the annual temporary modification hearings in December 2018 and 2019.

O. Direct Use Water Supply Sub-classification

Also in the March 2012 rulemaking hearing, the Commission adopted a sub-classification of the Domestic Water Supply Use called “Direct Use Water Supply Lakes and Reservoirs Sub-classification” (Regulation 31, at 31.13(1)(d)(i)). This sub-classification is for Water Supply lakes and reservoirs where there is a plant intake location in the lake or reservoir or a man-made conveyance from the lake or reservoir that is used regularly to provide raw water directly to a water treatment plant that treats and disinfects raw water. The Commission has begun to apply this sub-classification and anticipates that it will take several basin reviews to evaluate all the reservoirs in the basin. The Commission adopted the DUWS sub-classification on the following reservoirs and added “DUWS” to the classification column in the standards tables. The public water systems are listed along with the reservoirs and segments.

Upper South Platte River segment 16b: Aurora Reservoir (City of Aurora)

Upper South Platte River segment 19: Strontia Springs Reservoir (Denver Water Board)

- Upper South Platte River segment 21: Aurora Rampart Reservoir (City of Aurora)
- Upper South Platte River segment 22a: McLellan Reservoir (Centennial W&SD), Quincy Reservoir (City of Aurora)
- Bear Creek segment 1d: Evergreen Lake (Evergreen Metro District)
- Clear Creek segment 17a: Arvada Reservoir (City of Arvada)
- Clear Creek segment 23: Ralston Reservoir (Denver Water Board, City of Arvada, North Table Mtn W&S)
- Clear Creek segment 24: Maple Grove Reservoir (Cons Mutual/Maple Grove)
- Big Dry Creek segment 2: Standley Lake (City of Northglenn, City of Thornton, City of Westminster)
- Boulder Creek segment 14: Lakewood Reservoir (City of Boulder)
- Boulder Creek segment 15: Kossler Lake (City of Boulder)
- Boulder Creek segment 17: Baseline Reservoir (City of Lafayette), Marshall Lake (City of Louisville), Thomas Reservoir (Town of Erie) and Waneka Reservoir (City of Lafayette)
- St. Vrain Creek segment 7: Boulder Reservoir (City of Boulder) Spurgeon (Lefthand WD, Niwot) and Left Hand Valley Reservoir (Lefthand WD, Niwot)
- St. Vrain Creek segment 10: Joder Reservoir (Lefthand WD, Niwot)
- St. Vrain Creek segment 13: Burch Lake (City of Longmont)
- Big Thompson River segment 11: Carter Lake (City of Louisville)
- Big Thompson River segment 12: Boyd and Loveland Lakes (City of Greeley)
- Big Thompson River segment 13: Berthoud (Town of Berthoud) and Johnstown Reservoir (Town of Johnstown)
- Big Thompson River segment 14: Lonetree Reservoir (Town of Johnstown)
- Big Thompson River segment 16: St. Mary's Lake (Prospect Mtn)
- Cache la Poudre River segment 14: Horsetooth Reservoir (City of Ft. Collins, Soldier Canyon FP, Spring Canyon W&SD, City of Greeley, Platte River Power Authority)
- Cache la Poudre River segment 21: North Poudre Reservoir No. 3 (Town of Wellington)

31.17(e)(iii) also allows the Commission to adopt numeric nutrient standards for Direct Use Water Supply ("DUWS") lakes and reservoirs. No standards were adopted based on this provision in this rulemaking.

P. Chromium III Standards

A review of the chromium III standards showed that uses were not always adequately protected by the standards currently in the tables. For example, the acute Aquatic Life standard is not protective of Water Supply at any hardness, so the Water Supply standard of CrIII(ac)=50(Trec) was added to all segments

with a Water Supply use. Additionally, the chronic standard to protect the Aquatic Life use classification may not be protective of the Agriculture use in some high-hardness situations. Therefore, a chromium III standard of CrIII(ch)=100(Trec) was added to segments with Aquatic Life and Agriculture use classifications, but no Water Supply use. At hardness less than 145 mg/L, the Agriculture standard is not protective of the Aquatic Life use, so the chronic chromium III Aquatic Life standard should be included/retained in all segments with an Aquatic Life use.

Uses	Acute	Chronic
Water supply (with or without Agriculture)	CrIII(ac) = 50(Trec)	CrIII(ch) = TVS
No water supply (with Agriculture)	CrIII(ac) = TVS	CrIII(ch) = TVS and CrIII(ch) = 100(Trec)
Aquatic Life Only (without Water Supply or Agriculture)	CrIII(ac) = TVS	CrIII(ch) = TVS

The Commission updated chronic chromium III standards to be consistent with the matrix for the following segments:

Upper South Platte River segments: 1a, 1b, 2b, 2c, 5c, 5d, 6a, 6b, 7, 8, 10a, 11a, 11b, 12, 13, 14, 15, 16a, 16b, 16c, 16d, 16e, 16f, 16g, 16h, 16i, 16j, 17a, 17b, 17c, 18, 19, 20, 21, 22a, 22b and 23

Cherry Creek segments: 1, 2, 3, 4a, 4b, 5 and 6

Bear Creek segments: 1c, 2, 4a, 5, 6a, 6b, 10, 11 and 12

Clear Creek segments: 2a, 2b, 2c, 4, 5, 9b, 11, 12, 13b, 14a, 14b, 15, 16a, 16b, 17a, 18a, 18b, 19, 21, 22, 23, 24 and 25

Big Dry Creek segments: 1, 2, 3, 4a, 4b, 5, 6 and 7

Boulder Creek segments: 4a, 4b, 4c, 4d, 5, 6, 7a, 7b, 8, 9, 10, 11, 13, 14, 15, 16 and 17

St. Vrain Creek segments: 3, 4a, 4b, 4c, 6, 7, 8, 9, 10, 11 and 13

Big Thompson River segments: 3, 4a, 4b, 4c, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18 and 19

Middle South Platte River segment: 3a, 3b, 5a, 5b, 5c and 7

Cache la Poudre River segments: 7, 8, 9, 10a, 10b, 11, 12, 13b, 13c, 14, 15, 16, 17, 18, 19, 20, 21 and 22

Laramie River segments: 1, 2a, 2b, 3 and 4

Lower South Platte River segments: 2a, 2b, 3, 4 and 5

Republican River segments: 1, 3, 4, 5, 8 and 9

Q. Other Standards for the Protection of Agriculture and Water Supply Uses

Similar to the issue identified in Section P above, there were additional segments where one or more uses are not adequately protected by current standards. For instance, depending on hardness, the Aquatic Life standards for cadmium, lead, and nickel were not protective of the Water Supply use. The Division reviewed all segments in Regulation No. 38 to determine if the current standards applied to each segment are fully protective of the assigned uses, and revised or added standards where appropriate.

A cadmium Water Supply standard was added to the following segments because the acute Aquatic Life standard is not protective when the hardness was greater than 200 mg/L in non-trout streams and 345 mg/L in trout streams. A lead Water Supply standard was added to the following segments because the acute Aquatic Life standard is not protective when hardness is greater than 79 mg/L. A nickel Water Supply standard was added to the following segments because the chronic Aquatic Life standard is not protective when hardness is greater than 216 mg/L. Cadmium, lead, and nickel Water Supply standards were added to the following segments:

Upper South Platte River segments: 1a, 1b, 2a, 2b, 2c, 3, 4, 5b, 5c, 5d, 6a, 6b, 7, 8, 9, 10a, 11a, 12, 13, 14, 15, 16b, 16i, 16j, 18, 19, 20, 21 and 22a

Cherry Creek segments: 1, 2, 3, 4a, 4b and 5

Bear Creek segments: 1a, 1b, 1c, 1d, 1e, 2, 3, 4a, 5, 6a, 6b, 7, 8, 9, 10, 11 and 12

Clear Creek segments: 1, 2a, 2b, 2c, 3a, 3b, 4, 5, 6, 9a, 9b, 10, 11, 12, 13a, 14a, 14b, 15, 16a, 17a, 17b, 18a, 18b, 19, 20, 21, 23 and 24

Big Dry Creek segments: 2, 4a, 4b, 5, 6 and 7

Boulder Creek segments: 1, 2a, 2b, 3, 4a, 4b, 4c, 4d, 5, 6, 9, 10, 11, 13, 14, 15, 16 and 17

St. Vrain Creek segments: 1, 2a, 2b, 4a, 4b, 4c, 5, 7, 8, 9, 10, 11, 12 and 13

Middle South Platte River segments: 1a, 1b, 4 and 7

Big Thompson River segments: 1, 2, 3, 4a, 4b, 7, 8, 11, 12, 13, 14, 15, 16, 17, 18 and 19

Cache la Poudre River segments: 1, 2a, 2b, 6, 7, 8, 9, 10a, 10b, 13a, 13c, 14, 15, 17, 18, 19, 20 and 21

Laramie River segments: 1, 2a, 2b, 3 and 4

Lower South Platte River: 1, 2a, 3, 4 and 5

Republican River: 1, 3, 5, 8 and 9

R. Other Site-Specific Revisions

Marston Forebay: Section 25-8-101(19), C.R.S., and Rule 31.5(38) of Regulation 38 defines "State Waters" as excluding "all water withdrawn for use until use and treatment have been completed." The Commission finds and determines for the following reasons that water contained within Marston Forebay meets this exclusion. Marston is an off-channel forebay, fed through Denver Water's Conduit 20, which diverts water from the South Platte River, and Conduit 15, which diverts water from Bear Creek. Water withdrawn from these two man-made conveyances is held in Marston until treated at the adjacent Marston Water Treatment Plant and used within Denver Water's potable water distribution system. Marston Forebay is located on a topographical rise and therefore has no surface water influence, other than precipitation. In addition, there is no infiltration of groundwater into the Forebay, and the amount of infiltration from the Forebay to groundwater is de minimis and inconsistent. The Forebay is surrounded by four dams and a dike, and four operational toe-drain systems that capture and manage seepage from the Forebay. There is also no managed fishery at Marston Forebay, and public access to the Forebay is restricted. The Commission created a new section 38.7 "Commission's Determinations Regarding State Waters" an listed Marston Forebay in this new section. In addition, a qualifier pointing at 38.7 was added to Upper South Platte segment23.

Clear Creek segments 7a and 7b: The Commission adopted Table Value Standards for Woods Creek and Lower Urad Reservoir for the protection of aquatic life. The Commission recognizes that there is uncertainty about the appropriate metals standards because of recent channel improvements done by Climax Molybdenum Company in Woods Creek between Upper Urad Reservoir and Lower Urad Reservoir in 2012 to 2015. It is uncertain whether and how the channel improvements will affect metals or whether sensitive life stages of cold water fish will be expected to be present in the short reach of restored surface channel downstream of the Henderson water treatment facility on Woods Creek. The

Commission adopted temporary modifications for cadmium, copper, iron, lead, mercury, nickel, silver and zinc with an expiration date of 6/30/2023. (The temperature temporary modification is discussed above in section M.)

The Commission adopted the temporary modifications with an expiration date of June 30, 2023. Climax will delay site-specific studies in Woods Creek, to allow Climax to complete construction and establish operational practices for water management and control of the new channels, and evaluate conditions in the channels including possible establishment of aquatic life in the channels. Conditions may change once the new channel stabilizes; therefore, an extended temporary modification duration is appropriate. The Commission will review progress on the study plan at the 2019 Issues Formulation Hearing for the South Platte Basin.

Clear Creek segments 14a, 14b, and 15: An expiration date of 12/31/2020 was added to all segments with a site-specific standard based upon water effect ratios. These standards are derived by measuring the toxicity of a pollutant to test organisms in laboratory water compared with the receiving water, including effluent. Changes in water chemistry, such as hardness, alkalinity and the concentrations of other toxics can all impact the toxicity of a specific pollutant, such as zinc. If there are significant changes in the chemistry of the receiving water or the effluent, then the water effect ratio analysis must be repeated and the site-specific standard updated to reflect current conditions. Since the water effect ratio studies for these segments were completed in the 1990s, the Commission applied an expiration date to require re-evaluation of these standards at the next triennial review.

Big Dry Creek segment 1, assessment locations: A site-specific standard for selenium for Big Dry Creek Segment 1 was adopted in 2007. In this hearing, the Commission replaced the assessment location bdc4.0 with bdc4.5 to provide safer access for field staff collecting samples. Bdc4.5 is located approximately one-half mile downstream of bdc4.0. Bdc4.5 represents instream conditions upstream of the City of Northglenn's discharge, which was the original purpose of sampling location bdc4.0. Attainment of the selenium standard will be assessed based on data collected at bdc1.5, bdc2.0 and bdc4.5. Data collected at the former site bdc4.0 may continue to be used for assessment. A typographical correction was also made for sampling location bdc2.0.

S. Typographical and Other Errors

The following edits were made to improve clarity and correct typographical errors:

- For Upper South Platte segments 9 and 20, "a.k.a. Waucondah Reservoir" was added to clarify the location of the waterbody.
- For Upper South Platte segment 10a, the second "Temporary Modification" was deleted and the expiration date was moved to a new line for clarity and consistency
- For Upper South Platte segment 12, a space was added to "Class1".
- For Upper South Platte segment 16a, the selenium standards were split over two lines (i.e., Se(ac)=TVS and Se(ch)=TVS). The Division combined these (i.e., Se(ac/ch)=TVS) to be consistent with formatting elsewhere. Similarly, for Clear Creek Segment 2b, the Division combined the Zn(ac)=TVS and Zn(ch)=TVS into Zn(ac/ch)=TVS. For Clear Creek Segment 16a, the Division combined the Cd(ac)=TVS and Cd(ch)=TVS into Cd(ac/ch)=TVS.
- For Upper South Platte segments 16h, 16i, and 16j, the Division standardized the formatting of the site-specific selenium standards to be consistent among segments.
- For Upper South Platte segment 21, the Division corrected the chronic arsenic standard, which was missing a digit (i.e., "0.02-0(Trec)" was replaced with "0.02-10(Trec)").

- For Upper South Platte segment 22b and St. Vrain Creek Segment 6, the Division corrected the chronic arsenic standard by adding "(Trec)", consistent with formatting elsewhere.
- For Bear Creek segments 1c, 1d, 1e, 2, and 3, the "equals" sign was missing from the chronic iron standard for water supply. The Division corrected this typo.
- For Bear Creek segment 1c, the temporary modifications were reformatted for consistency.
- For Bear Creek segment 9, specific naming of Summit Lake was included to increase clarity.
- For Bear Creek segment 11, there was an extra space in the segment description. The Division corrected this typo.
- For Clear Creek segments 4, 5, 6, 7a, 8, the stream name was corrected as "West" Fork Clear Creek.
- For Clear Creek segment 9a, the typo "the" was removed.
- For Clear Creek segments 12 and 23, the Division corrected a formatting issue in the metals column.
- For Clear Creek segment 13a, punctuation was corrected.
- For Clear Creek segment 13b, the extra space after the word "Gulch" was deleted.
- For Clear Creek segment 21, the extra comma after the word "CO" was deleted.
- For Clear Creek segment 21 and 22, the word "baseline" was capitalized for consistency.
- For Clear Creek segment 24, the space within the word "Segments" was deleted.
- For Clear Creek segment 25, the description was revised to provide a more detailed location description.
- For Big Dry Creek segment 4b, the extra period at the end of the description was deleted.
- For Big Dry Creek segment 5, the typo "a" was removed and "for segment 5" was added to complete the note.
- For Boulder Creek segment 1, the segment description was expanded to include James Peak Wilderness Area and "s" was added to "Area".
- For Boulder Creek segment 2b, the typo "the" was removed.
- For Boulder Creek segment 4a, the segment description was amended to exclude listings in segment 1 for clarity.
- For Boulder Creek segment 13, the segment description was expanded to include James Peak Wilderness Area and "s" was added to "Area".
- For Boulder Creek segment 14, Lakewood Reservoir was added to the segment description for identification of DUWS.

- For Boulder Creek segment 15, Gross Reservoir was removed from this segment and moved to new segment 18. The description of segment 15 was amended to exclude listings in segment 13 and 18 for clarity.
- For St. Vrain Creek segment 7, Spurgeon Reservoir was added to the segment description for identification of DUWS. Additionally, the “and” between Coot Lake and Left Hand was deleted.
- For Middle South Platte segment 5b, the spelling of “Boxelder” was changed to Box Elder to be consistent with maps.
- For Middle South Platte segment 6, the Division added (ch) to all of the Metals standards to be consistent with formatting elsewhere.
- For Middle South Platte segment 6, the description was clarified by replacing “Lost Creek from Interstate 76 south...” with “Lost Creek from the source to Interstate 76....”
- For Big Thompson segment 16, St. Mary’s Lake was added to the segment description for identification of DUWS.
- For Cache le Poudre segments 2a and 10a, the spelling “Monroe” was changed to “Munroe”, the word “Headgate” was added, and the description was clarified by replacing “/North Poudre Supply canal diversion” with “(also known as the North Poudre Supply Canal diversion)”.
- For Lower South Platte segment 4, both the nitrate and nitrite standards were duplicated in the Inorganic column of the tables. The Division deleted the least restrictive nitrate/nitrite set.
- For Republican River segment 5, the Division deleted an extra “the” from the segment description.

PARTIES TO THE RULEMAKING HEARING

1. Big Dry Creek Watershed Association
2. City of Black Hawk and Black Hawk/Central City Sanitation District
3. City of Boulder
4. Centennial Water and Sanitation District
5. Central Clear Creek Sanitation District
6. Climax Molybdenum Company
7. Cottonwood Water and Sanitation District
8. Denver Water
9. City of Fort Collins
10. Front Range Energy
11. City of Greeley
12. Littleton/Englewood Wastewater Treatment Plant
13. Metro Wastewater Reclamation District
14. MillerCoors
15. Town of Milliken
16. Parker Water and Sanitation District
17. Plum Creek Water Reclamation Authority
18. Public Service Company of Colorado
19. Suncor Energy (U.S.A.) Inc
20. City of Northglenn
21. Colorado Parks and Wildlife
22. City of Westminster
23. Bear Creek Watershed Association
24. Upper Clear Creek Watershed Association

25. City of Golden
26. U.S. Environmental Protection Agency
27. South Adams County Water and Sanitation District
28. Colorado Trout Unlimited
29. City and County of Broomfield
30. City and County of Denver
31. Chatfield Watershed Authority
32. Town of Castle Rock
33. Douglas County Public Works
34. Cherry Creek Basin Water Quality Authority