



Water Quality Standards Revisions Supporting Documentation **Proposed Amendments to R317-2-13, and R317-2-14, Standards of Quality for Waters of the State Published in the April 1, 2019 Utah Bulletin**

Note: This document is intended as a companion document to the information published in the April 1, 2019 Utah Bulletin. This document provides supplemental information for a subset of the proposed amendments to R317-2 described in the April 1, 2019 Utah Bulletin. Additional information on the proposed headwaters nutrient criteria and a copy of the markup submitted for publication in the Utah Bulletin are also available on the DWQ website. The information in the Utah Bulletin prevails should any unintentional discrepancies occur between these documents and the Utah Bulletin

Comments will be accepted until 5:00 p.m., May 3, 2019. Comments should be mailed to Christopher Bittner, Utah Division of Water Quality, P.O. Box 144870, SLC, Utah 84114-4870 or e-mailed to cbittner@utah.gov. Comments can be received by phone at 801-536-4371. Comments will also be accepted at the public hearing. The public hearings will be preceded by one hour for DWQ staff to provide additional information and answer general questions. The public hearings to receive comments will be held for a minimum of one hour at the following time and location:

PUBLIC HEARING DATE	TIME	LOCATION
Wednesday, May 1, 2019	6:00 PM	Utah Department of Environmental Quality Multi-State Agency Office Building, Board Room 195 N. 1950 W Salt Lake City, UT 84116

Proposed Standards Revisions

- 1) Addition of the Class 1C drinking water use to Sheep Creek, Cache County; page 2 and Attachment 1.
- 2) Revised aquatic life ammonia criteria for portions of Mill Creek, Jordan River, and Surplus Canal, Salt Lake County; page 2 and Attachment 2
- 3) Revised agricultural use total dissolved solids criterion for a portion of Silver Creek, Summit County; page 4 and Attachment 3
- 4) Corrections to aquatic life cadmium criteria and human health criteria, statewide; page 5 and Attachment 4

1. Addition of Class 1C drinking water use to portions of the Blacksmith Fork and tributaries from the confluence with Left Hand Fork Blacksmith Fork to headwaters, Cache County. The homeowners association petitioned for this change and the change is supported by the Utah Division of Drinking Water. Their request and a watershed map delineating the proposed change is provided as Attachment 1. The proposed changes to R317-2-13. are:

Blacksmith Fork and tributaries, from confluence with Logan River
to headwaters except as listed below 2B 3A 4

Sheep Creek and tributaries from confluence with Blacksmith Fork River to headwaters.	1C	2B 3A	4
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2. The following summary is based on the data and findings presented in the *Criteria Support Document: Site-specific criteria based on recalculated aquatic life water quality criteria for ammonia for a segment of Mill Creek and the Jordan River, Salt Lake County, Utah* provided as Attachment 2. Site-specific ammonia criteria for the protection of aquatic life for Mill Creek and a segment of the Jordan River, Salt Lake County are proposed. The criteria apply to Mill Creek from I-15 to the Jordan River, the Jordan River from Mill Creek to 900 South and the Surplus Canal from the Jordan River to 900 South. The proposed criteria are based on the latest scientific information recommended by the [EPA \(2013\)](#). The site-specific criteria are based on the absence of unionid mussels and salmonids (trout) as presented in Appendix N of [EPA \(2013\)](#).

Unionid mussels have not been discovered in recent surveyed portions of the Jordan River, but historically they were documented to be present in tributaries and were likely present in the Jordan River. Today, this segment of the Jordan River is biologically and chemically degraded as indicated by the water quality impairments identified in Utah's Integrated Report. The mussels rely on a fish host to complete their life cycle and questions remain regarding the suitability of the fish that are present to serve as hosts. There is no evidence that these mussels are present in the identified portions of Mill Creek, Jordan River, Surplus canal, or surrounding watersheds. Therefore, these mussels are unlikely to return within a reasonable planning horizon without human intervention. Efforts to restore the Jordan River are ongoing but are unlikely to be sufficient to support the potential reintroduction of unionid mussels within the reasonable planning horizon of the next 30 years. The Utah Division of Wildlife supports this conclusion and they are responsible for identifying, protecting and reintroducing unionid mussels in Utah waters.

The current designated uses are to protect warm water aquatic life and do not include salmonids. Additionally, there is no evidence that salmonids reside in this reach of Mill Creek or this reach of Jordan River or Surplus Canal. Therefore, neither unionid mussels nor salmonids are residents for the purpose of determining the ammonia criteria.

In addition to the presence/absence of unionid mussels and salmonids, the ammonia criteria consider the presence of the early life stages of fish, temperature and pH. Early life stages of fish can be more sensitive to ammonia at certain temperatures and pH. When early life stages are more sensitive to ammonia toxicity, the criteria are more stringent for the months that they are present. UDWQ protects for early life stages of fish for those applicable months for which they are likely to occur in the identified reaches of Mill Creek, Jordan River, and Surplus Canal.

As shown in the highlighted font below, the proposed criteria are expressed as mathematical equations that include both pH and temperature:

R317-2-14, Table 2.14.2, Footnote 9

(9a) The thirty-day average concentration of total ammonia nitrogen (in mg/l as N) does not exceed, more than once every three years on the average, the chronic criterion calculated using the following equations.

Fish Early Life Stages are Present:

$$\text{mg/l as N (Chronic)} = ((0.0577/(1+10^{7.688-\text{pH}})) + (2.487/(1+10^{\text{pH}-7.688}))) * \text{MIN}(2.85, 1.45*10^{0.028*(25-T)})$$

Fish Early Life Stages are Absent:

$$\text{mg/l as N (Chronic)} = ((0.0577/(1+10^{7.688-\text{pH}})) + (2.487/(1+10^{\text{pH}-7.688}))) * 1.45*10^{0.028*(25-\text{MAX}(T,7))}$$

Mill Creek (Salt Lake County) from confluence with Jordan River to Interstate 15, Jordan River from 900 South Street to confluence with Mill Creek, Surplus Canal from 900 South Street to diversion from the Jordan River, Fish Early Life Stages are Present:

$$\text{mg/l as N (Chronic)} = 0.9405 * ((0.0278/(1+10^{7.688-\text{pH}})) + ((1.1994/(1+10^{\text{pH}-7.688}))) * \text{MIN}(6.920, (7.547*10^{0.028*(20-T)}))$$

Mill Creek (Salt Lake County) from confluence with Jordan River to Interstate 15, Jordan River from 900 South Street to confluence with Mill Creek, Surplus Canal from 900 South Street to diversion from the Jordan River, Fish Early Life Stages are Absent:

$$\text{mg/L as N (chronic)} = 09.405 * (((0.0278/(1+10^{7.688-\text{pH}})))+(1.1994/(1+10^{\text{pH}-7.688}))) * (7.547*10^{0.028*(20-\text{MAX}(T,7))})$$

(9b) The one-hour average concentration of total ammonia nitrogen (in mg/l as N) does not exceed, more than once every three years on the average the acute criterion calculated using the following equations.

Class 3A:

$$\text{mg/l as N (Acute)} = (0.275/(1+10^{7.204-\text{pH}})) + (39.0/1+10^{\text{pH}-7.204})$$

Class 3B, 3C, 3D:

$$\text{mg/l as N (Acute)} = 0.411/(1+10^{7.204-\text{pH}})) + (58.4/(1+10^{\text{pH}-7.204}))$$

Mill Creek (Salt Lake County) from confluence with Jordan River to Interstate 15, Jordan River from 900 South Street to confluence with Mill Creek, Surplus Canal from 900 South Street to diversion from the Jordan River:

$$\text{mg/l as N (Acute)} = 0.729 * (((0.0114/(1+10^{7.204-\text{pH}})))+(1.6181/(1+10^{\text{pH}-7.204}))) * \text{MIN}(51.93, (62.15*10^{0.036*(20-T)}))$$

In addition, the highest four-day average within the 30-day period should not exceed 2.5 times the chronic criterion. The "Fish Early Life Stages are Present" 30-day average total ammonia criterion will be applied by default unless it is determined by the Director, on a site-specific basis, that it is appropriate to apply the "Fish Early Life Stages are Absent" 30-day average criterion for all or some portion of the year. At a minimum, the "Fish Early Life Stages are Present" criterion will apply from the beginning of spawning through the end of the early life stages. Early life stages include the pre-hatch embryonic stage, the post-hatch free embryo or yolk-sac fry stage, and the larval stage for the species of fish expected to occur at the site. The Director will consult with the Division of Wildlife Resources in making such determinations. The Division will maintain information regarding the waterbodies and time periods where application of the "Early Life Stages are Absent" criterion is determined to be appropriate.

The table below shows an example of the existing and proposed ammonia water quality criteria at a pH of 8.0 and a water temperature of 24°C.

Comparison of Existing Ammonia Criteria to Proposed Criteria at a pH of 8.0 and Temperature of 24°C, Jordan River Segment, Salt Lake County		
	Existing Criteria, (mg/L)	Proposed Criteria, (mg/L)
1-hour average	8.4	7.5
30-day average (mg/L) when early life stages of fish present	1.3	2.3
30-day average, when early life stages of fish absent	1.3	2.3

- The summary below is based on the data and findings presented in the *Criteria Support Document: Use and Value Assessment and Site-specific Criteria for Total Dissolved Solids (TDS): Silver Creek, Version 2.1* provided as Attachment 3. A site-specific total dissolved solids (TDS) criterion to protect the agricultural designated use is proposed for a portion of Silver Creek, Summit County. Specifically, a maximum TDS criterion of 1,900 mg/L is proposed for Silver Creek and tributaries from Tollgate Creek to headwaters.

Road salting in the Park City area is impacting the water quality of Silver Creek by increasing the concentrations of TDS. The water quality of Silver Creek is also adversely

impacted by water diversions and metals contamination from the historic mining activities in the Park City area.

The TDS criterion is intended to protect the agricultural uses of Silver Creek water. After determining that road salt was the primary source of the anthropogenic portion of TDS loadings to Silver Creek, local and state road maintenance agencies were contacted and their best management practices (BMPs) reviewed. BMPs are currently being implemented (primarily liquid potassium chloride pre-treatment of roads, sweeping and metered application) but salt application on private properties remains unregulated. The governmental agencies emphasized the importance of road salting for public safety. This road salting to protect human life and health is considered an irreversible human-caused condition.

After considering all of the current and likely future irrigation practices with Silver Creek water and researching the salt tolerances of the irrigated crops, staff concluded that a higher criterion will protect the agricultural uses. The irrigation uses in this reach are primarily for moderately salt-tolerant pasture grasses. Staff is proposing to change the TDS criterion from 1,200 mg/L to 1,900 mg/L. Although a criterion higher than 1,900 mg/L would likely still be protective of the agricultural uses, limiting the criterion to 1,900 mg/L will support the continued attainment of the 1,200 mg/L criterion downstream.

The following changes to R317-2-13.4 Weber River Basin are recommended by staff.

(a) Weber River Drainage

Weber River and tributaries, from Stoddard diversion to Headwaters, except as listed below

1C	2B	3A	4	
<u>Silver Creek and tributaries, from confluence with Weber River to below the confluence with Tollgate Creek</u>				
1C	2B	3A	4	
<u>Silver Creek and tributaries, from confluence with Tollgate Creek to Headwaters</u>				
	1C	2B	3A	4*

R317-2-14. Numeric Criteria Table 2.14.1

FOOTNOTE: (4)

Silver Creek and tributaries, Summit County, from confluence with Tollgate Creek to headwaters maximum 1,900 mg/L.

- In 2018, the Water Quality Board updated several statewide criteria and not all of the changes were made as intended. With the exception of the correction of the aquatic life cadmium criteria in Table 2.14.2, all other corrections are for human health criteria in Tables 2.14.1 and 2.14.6. Attachment 3 is a list of the criteria to be corrected.

ATTACHMENT 1

ATTACHMENT 1: Addition of Class 1C to Sheep Creek, Cache County

ATTACHMENT 1

Sheep Creek Cove Homeowners, Assn. Inc.
4602 W 4950 S
Hooper, UT 84315
February 13, 2017

Ms. Erica Gaddis, Director
Utah Division of Water Quality
P.O. Box 144870
Salt Lake City, UT 84114-4870

Dear Ms. Gaddis:

The Sheep Creek Cove Homeowners Association, Inc. located in Cache County is requesting that Sheep Creek receive a new classification as a Class 1 category water under UAC R317-2. Sheep Creek is part of the Blacksmith Fork Drainage and the property involved with the HOA is located six miles south of Hardware Ranch off the Ant Flat Road.

The following details are included for your use:

Assessment Unit Name: Black Smiths Fork - 2
Assessment Unit Description: Blacksmith Fork and tributaries from confluence with Left Hand Fork Blacksmith Fork to headwaters
Assessment Unit ID: UT16010203-018_00

The Homeowners Association is in the process of obtaining design approval for a culinary water filtration system with the Utah Department of Environmental Quality Drinking Water. This system will augment our existing spring-fed culinary water system which has insufficient flow.

Please let us know if other/additional materials are needed to exact this classification.

Sincerely,



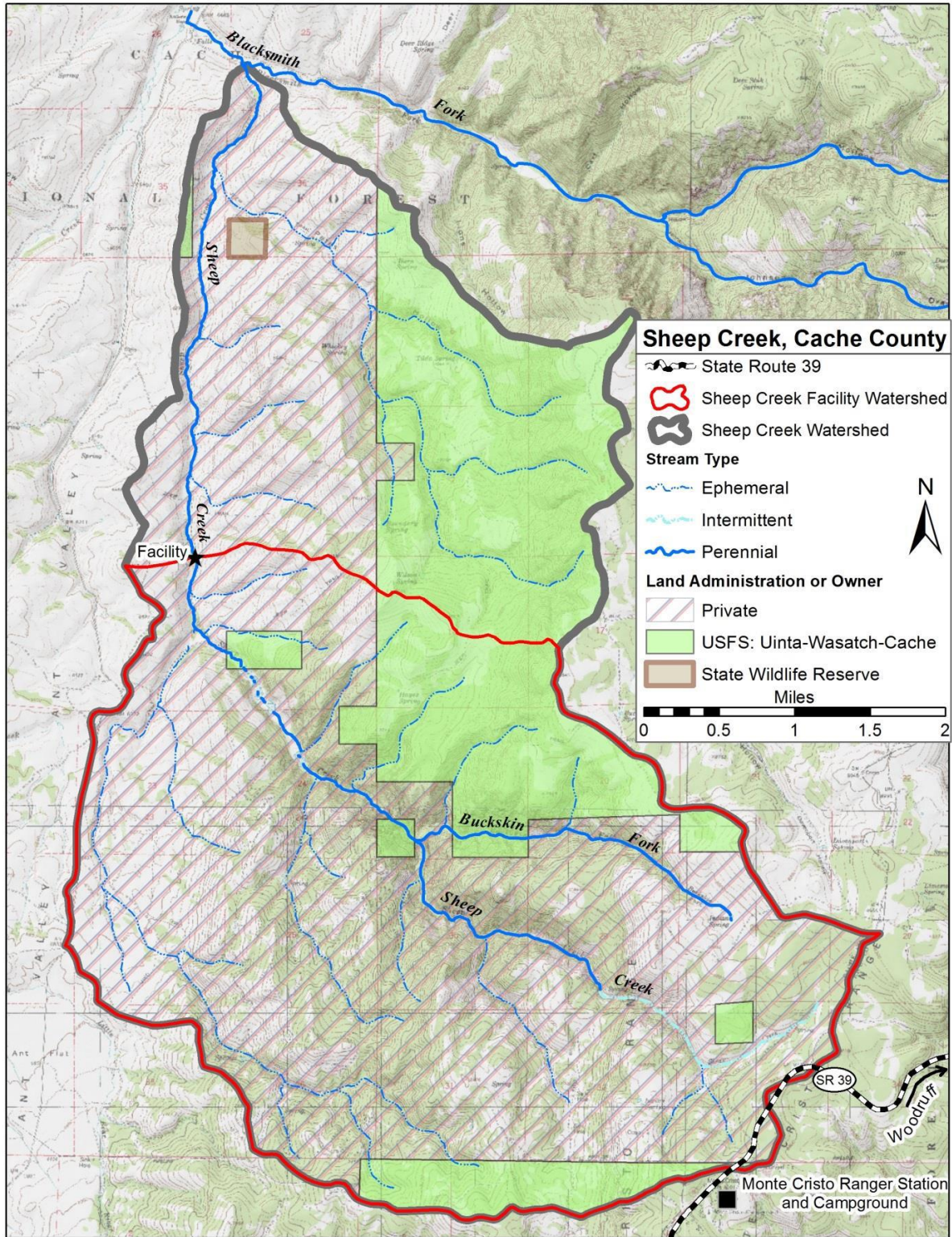
David A. Prevedel, Director
Sheep Creek Cove Homeowners Assn. Inc.

cc: Deidre Beck



DWQ-2018-001788

ATTACHMENT 1



ATTACHMENT 2

Criteria Support Document: Site-specific criteria based on recalculated aquatic life water quality criteria for ammonia for a segment of Mill Creek and the Jordan River, Salt Lake County, Utah

Available at <https://deq.utah.gov/water-quality/guidance-water-quality-standards>
DWQ-2018-013091

ATTACHMENT 3

***Criteria Support Document: Use and Value Assessment and Site-specific
Criteria for Total Dissolved Solids (TDS): Silver Creek, Version 2.2***

Available at <https://deq.utah.gov/water-quality/guidance-water-quality-standards>
DWQ-2019-013090

ATTACHMENT 4

ATTACHMENT 4: Criteria Corrections

ATTACHMENT 4

Criteria Corrections

In the summer of 2018, the Water Quality Board adopted revisions to Utah's human health criteria. The U.S. Environmental Protection Agency identified several discrepancies between the criteria that the supporting documents indicated would be adopted and the criteria that were actually adopted. The U.S. Environmental Protection Agency also identified some additional inconsistencies where MCL-only criteria were not moved from Table 2.14.6 to Table 2.14.1 Class 1C. The table below summarizes the proposed corrections.

The chronic cadmium criterion equation will be corrected as follows:

$$\text{CADMIUM} \quad CF * e^{(0.7977 * \ln(\text{hardness}) - 3.909)}$$

The corrections to the Class 1C criteria in Table 2.14.1 and the human health criteria in Table 2.14.6 are shown in the following table.

ATTACHMENT 4

Human Health Criteria Corrections and Intended Revisions From the Utah 2018 Water Quality Standards Revisions				
CAS	Pollutant	Organism +Water	Organism only	Explanation
57-12-5	Cyanide	4	400	Criteria not updated as intended
107-02-8	Acrolein	3		Delete significant figure
117-81-7	Bis(2-Ethylhexyl)Phthalate		0.37	Criteria updated but more stringent than EPA (2015)
85-68-7	Butylbenzyl Phthalate	0.010	0.010	Add significant figure
108-90-7	Chlorobenzene		800	Incorrect CAS # and organism only not updated
124-48-1	Chlorodibromomethane	0.80	21	Criteria not updated as intended
67-66-3	Chloroform	60	2000	Criteria not updated as intended
75-27-4	Dichlorobromomethane	0.95	27	Criteria not updated as intended
74-83-9	Methyl Bromide	100		Old criteria not deleted, result 47100
205-99-2	Benzo(b)fluoranthene		0.0013	Criteria not updated as intended
111-44-4	Bis(2-chloroethylether)			Correct CAS
218-01-9	Chrysene	0.12	0.13	Criteria not updated as intended
53-70-3	Dibenz(a,h)anthracene	0.00012	0.00013	Criteria not updated as intended
91-94-1	3,3-Dichlorobenzidine	0.049		Add significant figure ,revised more stringent than EPA (2015)
84-66-2	Diethyl Phthalate			Correct CAS
121-14-2	2,4-Dinitrotoluene	0.049		Correct criteria, revised less stringent than EPA (2015)
122-66-7	1,2-Diphenylhydrazine	0.03	0.2	Criteria not updated as intended
67-72-1	Hexachloroethane	0.1	0.1	Criteria not updated as intended
621-64-7	N-nitrosodi-n-propylamine	0.0050		Add significant figure to be consistent, no changes were made to act on
120-82-1	1,2,4-Trichlorobenzene	0.071		Add significant figure, revised more stringent than EPA (2015)
319-84-6	Alpha_BHC		0.00039	More stringent than EPA (2015)

ATTACHMENT 4

Human Health Criteria Corrections and Intended Revisions From the Utah 2018 Water Quality Standards Revisions				
319-85-7	Beta-BHC	0.0080		Add significant figure
57-74-9	Chlordane	0.00031		Add significant figure, revised more stringent than EPA (2015)
50-29-2	DDT	0.000030		Revised less stringent than EPA
72-20-8	Endrin		0.03	Old criterion not deleted
8001-35-2	Toxaphene	0.00070		Add significant figure
1912-24-9	Atrazine	3.0		MCL only, moved to Table 2.14.1, need to delete from 2.14.6
75-99-0	Dalapon			MCL only, moved to Table 2.14.1, need to delete from 2.14.6
156-59-2	Dichloroethylene (cis-1,2)			MCL only, move to Table 2.14.1
85-00-7	Diquat			MCL only, moved to Table 2.14.1, need to delete from 2.14.6
1071-83-6	Glyphosate			MCL only, move to Table 2.14.1
1330-20-7	Xylenes			MCL only, move to Table 2.14.1
542-88-1	Bis(2-chloro1methylether)			Delete duplicated entry
108-60-1	Bis(2-chloromethylethylether			Delete duplicated entry
930-55-2	N-Nitrosopyrrolidine			Correct spelling
72-43-5	Methoxychlor			Delete MCL label