

**Rationale for Proposed Revisions to the
Nevada Water Quality Regulations
NAC 445A.1286, NAC 445A.1698 and NAC
445A.1702**

Smoke, Bronco and Gray Creek Standards



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Introduction

Background

Through section 303 of the Clean Water Act (CWA), U.S. Environmental Protection Agency (EPA) has delegated authority to Nevada to establish surface water quality standards (Standards) for all water bodies or segments of water bodies that lie within the state. Standards are composed of three parts: designated beneficial uses (Uses), water quality criteria (Criteria) and developing and implementation of antidegradation policies and procedures.

The CWA also requires that states periodically review and, as appropriate, update Standards. The following document includes proposed revisions to the State of Nevada (Nevada) Water Pollution Control Regulations (Nevada Regulations) to the interstate waters Smoke, Bronco and Gray Creeks, contained in the Nevada Administrative Code (NAC) 445A.1286, 445A.1698 and 445A.1702, the rationale to support the proposed revisions and a summary of the data analysis.

Smoke Creek is approximately 30 miles Southeast of Susanville, CA and Bronco and Gray Creeks flow into the Truckee River, upstream of Reno, between Hirschdale and Floriston, CA (Figure 1).

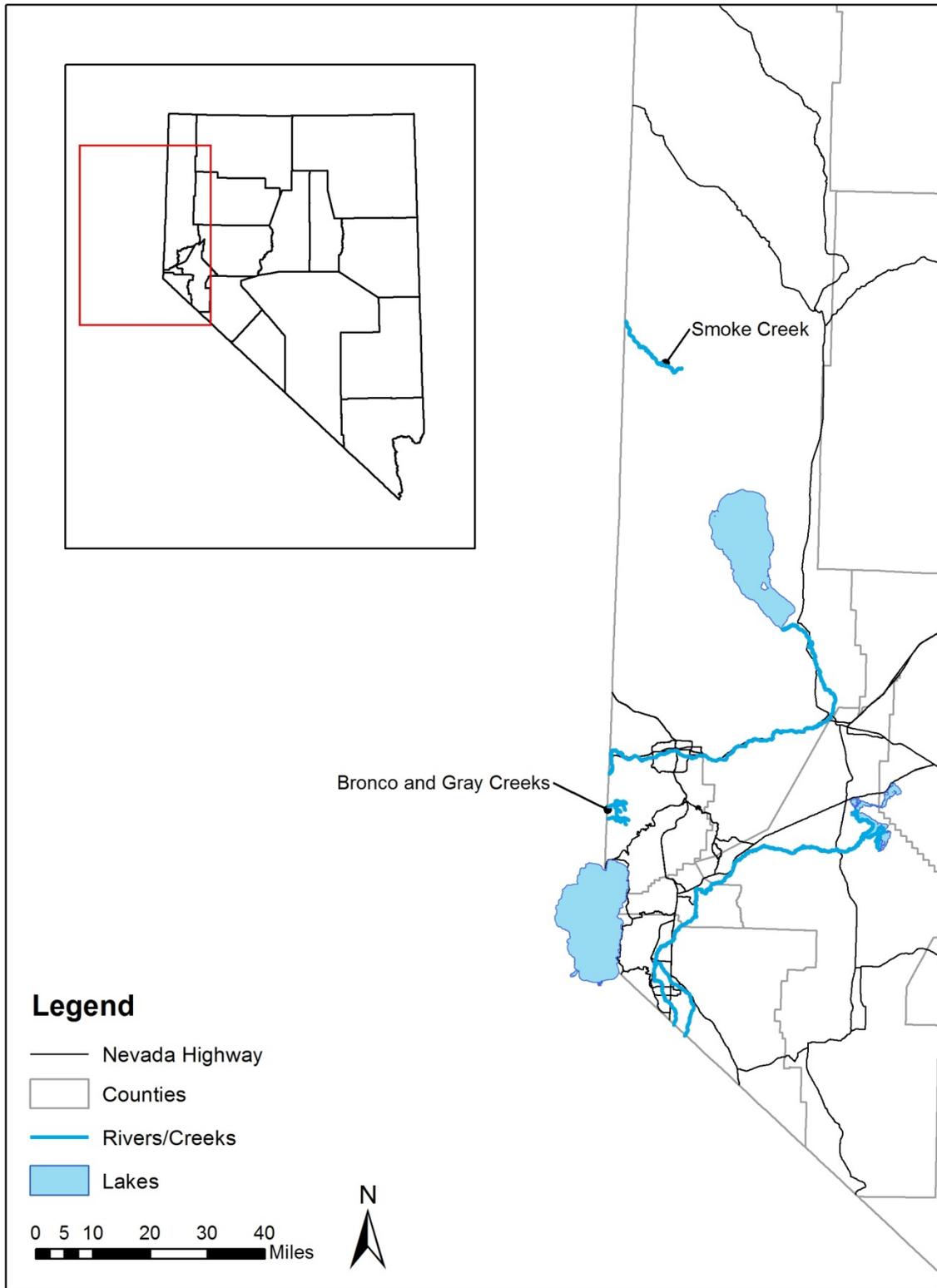


Figure 1. Smoke, Bronco and Gray Creeks Locations

Nevada Beneficial Use Standards

Nevada's Standards define the water quality goals for a waterbody, or a portion of a waterbody by designating Uses of the water and setting Criteria necessary to protect the Uses. Nevada's Uses are contained in NAC 445A.122 and are listed below in Table 1.

Table 1. List of Nevada's designated beneficial uses contained in NAC 445A.122.

Watering of Livestock	Municipal or domestic supply
Irrigation	Industrial supply
Aquatic life	Propagation of wildlife
Recreation involving contact with the water	Waters of extraordinary ecological or aesthetic value
Recreation not involving contact with the water	Enhancement of water quality

Nevada's Standards contain both narrative and numeric Criteria. The narrative Standards contained in NAC 445A.121 apply to all surface waters of the state and require waters to be "free from" various pollutants in sufficient levels so as to not be unsightly, interfere with any Uses, create a public nuisance, be toxic to human, animal, plant or aquatic life or have any adverse effects.

Site specific numeric Standards have been developed for the major waterbodies in Nevada, often referred to as "designated" waters. The Standards for designated waters include Criteria designed to protect the Uses and in certain cases antidegradation requirements.

Nevada's antidegradation requirements are contained in the Nevada Revised Statutes (NRS) NRS 445A.565. This statute is to protect and maintain existing water quality. Many surface waters have higher water quality than their adopted Standards. Discharges to these waters must not cause degradation unless there is justification to lower existing water quality.

Purpose of Petition

Smoke, Bronco and Gray Creeks beneficial uses and standards were reviewed in 2010 (petition R127-10). The Nevada State Environmental Commission approved these changes on October 5, 2010. The changes were then sent to the U. S. Environmental Protection Agency Region 9 (EPA) for approval. All of the proposed beneficial uses were approved. The standards revisions proposed by NDEP were all approved except the Dissolved Oxygen standard for Gray Creek and the Chloride standard for Smoke, Bronco and Gray Creeks. This petition is to return the original Dissolved Oxygen standard of 7 mg/l to Gray Creek and update the chloride numeric standard for Smoke, Bronco and Gray Creeks to the current recommended EPA aquatic life criteria of 230/860 mg/l chronic and acute.

Smoke Creek - Discussion of Proposed Revisions and Water Quality Data

Chloride

Proposed Action and Rationale for Action

Smoke Creek's chloride standard most restrictive beneficial use is aquatic life. It is proposed to set the chloride Criteria to the most current recommended EPA Criteria from EPA 440/5-88-001, Ambient Water Quality Criteria for Chloride – 1988, of a one-hour average of 860 mg/l and a 96-hour average of 230 mg/l which are not to be exceeded more than once in any three year period for protection of aquatic life.

Chloride is a natural mineral salt that is ubiquitous throughout the different Nevada hydrobasins. Natural factors such as an arid climate; periodic drought conditions; and evaporation processes can inherently increase

the chloride concentrations in surface waters. Except for select terminal waterbodies (e.g. Humboldt Sink and Walker Lake), the chloride concentrations routinely measured in Nevada surface waters are generally below the proposed water quality standard and provides protection of freshwater fish, invertebrates and plants that are found in Nevada surface waters. Additionally, the Division's proposed Antidegradation Policy would minimize any anthropogenic changes in chloride concentrations from existing water quality levels that could impact resident aquatic life. This Criteria also protects for irrigation and propagation of wildlife Uses. Table 2 lists the standards for Smoke Creek along with the proposed chloride criteria.

Discussion of Chloride Data

There are a total of 44 samples on Smoke Creek with Chloride values ranging from 1 to 34 mg/l. No samples exceeded the proposed Criteria.

Table 2 Water quality standards table for Smoke Creek with proposed chloride criteria.

NAC 445A.1286. The limits of this table apply to the body of water known as Smoke Creek from the Nevada State line to the Smoke Creek Desert. Smoke Creek is located in Washoe County.

STANDARDS OF WATER QUALITY

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	Beneficial Use ^a												
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh		
Beneficial Uses			X	X	X	X	X			X					
Aquatic Life Species of Concern															
Temperature - °C		S.V. Summer ≤ 25.0 S.V. Winter ≤ 14.0			*	X									
pH - SU		S.V. 6.5 - 9	X	X	*	*				*					
Dissolved Oxygen - mg/l		S.V. ≥ 5.0	X		*	X	X			X					
Total Phosphorus (as P) - mg/l		^b S.V. ≤ 0.1			*	*	X								
Nitrogen Species (as N) - mg/l		Nitrate S.V. ≤ 90	X		*					X					
		Nitrite S.V. ≤ 5	X		*					X					
		Total Nitrogen ^b			*	*									
Total Ammonia (as N) - mg/l		^c			*										
Total Dissolved Solids - mg/l		S.V. ≤ 1000	X	*											
Chloride - mg/l		S.V. ≤ 250 1-hr Avg. ≤ 860^d 96-hr Avg. ≤ 230	X		*					X					
Turbidity - NTU		S.V. ≤ 50			*										
E Coli –No./100 ml		AGM ≤ 126 S.V. ≤ 410				*	X								
Fecal Coliform - No./100 ml		S.V. ≤ 1000	*	*			X			*					

* = The most restrictive beneficial use.

X = Beneficial use.

^a Refer to NAC 445A.122 and 445A.1622 for beneficial use terminology.

^b Waters shall be free from nutrient concentrations from other than natural source that cause the growth of algae or aquatic plants in amounts that interfere with any beneficial uses of the water.

^c The ambient water quality criteria for ammonia are specified in NAC 445A.118.

^d **One-hour and 96-hour average concentration limits may be exceeded only once every 3 years.**

Bronco Creek - Discussion of Proposed Revisions and Water Quality Data

Chloride

Proposed Action and Rationale for Action

Bronco Creek's chloride standard proposed most restrictive beneficial use is aquatic life. It is proposed to set the chloride Criteria to the most current recommended EPA Criteria from EPA 440/5-88-001, Ambient Water Quality Criteria for Chloride – 1988, of a one-hour average of 860 mg/l and a 96-hour average of 230 mg/l which are not to be exceeded more than once in any three year period for protection of aquatic life.

Chloride is a natural mineral salt that is ubiquitous throughout the different Nevada hydrobasins. Natural factors such as an arid climate; periodic drought conditions; and evaporation processes can inherently increase the chloride concentrations in surface waters. Except for select terminal waterbodies (e.g. Humboldt Sink and Walker Lake), the chloride concentrations routinely measured in Nevada surface waters are generally below the proposed water quality standard and provides protection of freshwater fish, invertebrates and plants that are found in Nevada surface waters. Additionally, the Division's proposed Antidegradation Policy would minimize any anthropogenic changes in chloride concentrations from existing water quality levels that could impact resident aquatic life. This Criteria also protects for irrigation, municipal and domestic supply and propagation of wildlife Uses. Table 3 lists the standards for Bronco Creek along with the proposed chloride criteria.

Discussion of Chloride Data

Bronco Creek has a total of 44 samples with Chloride values ranging from 0 to 11 mg/l. No samples exceeded the proposed criteria.

Table 3. Water quality standards table for Bronco Creek with proposed chloride criteria.

NAC 445A.1698. The limits of this table apply to the body of water known as Bronco Creek from its origin to the Nevada State Line. Bronco Creek is located in Washoe County.

STANDARDS OF WATER QUALITY

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	Beneficial Use ^a														
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh				
Beneficial Uses			X	X	X	X	X	X	X	X	X						
Aquatic Life Species of Concern																	
Temperature - °C		Avg. Jun-Sep ≤ 20.0 S.V. Summer ≤ 25.0 S.V. Winter ≤ 13.0			*	X											
pH – SU		S.V. 6.5 - 9	X	X	*	*		X	X	*							
Dissolved Oxygen - mg/l		S.V. ≥ 6.0	X		*	X	X	X		X							
Total Phosphorus (as P) - mg/l		^b S.V. ≤ 0.1			*	*	X	X									
Nitrogen Species (as N) - mg/l		Nitrate S.V. ≤ 10	X				*		X								
		Nitrite S.V. ≤ 0.06	X		*		X		X								
		Total Nitrogen ^b			*	*											
Total Ammonia (as N) - mg/l		^c			*												
Total Dissolved Solids - mg/l		S.V. ≤ 500	X	X				*									
Chloride - mg/l		S.V. ≤ 250 1-hr. Avg. ≤ 860^d 96-hr. Avg. ≤ 230	X		*			* X		X							
Sulfate - mg/l		S.V. ≤ 250						*									
Turbidity - NTU		S.V. ≤ 10			*												
Color - PCU		S.V. ≤ 75						*									
E Coli - No./100 ml		AGM ≤ 126 S.V. ≤ 410				*	X										
Fecal Coliform - No./100 ml		S.V. ≤ 1000	*	*				X	X	*							

* = The most restrictive beneficial use.

X = Beneficial use.

^a Refer to NAC 445A.122 and 445A.1622 for beneficial use terminology.

^b Waters shall be free from nutrient concentrations from other than natural source that cause the growth of algae or aquatic plants in amounts that interfere with any beneficial uses of the water.

^c The ambient water quality criteria for ammonia are specified in NAC 445A.118.

^d **One-hour and 96-hour average concentration limits may be exceeded only once every 3 years.**

Gray Creek - Discussion of Proposed Revisions and Water Quality Data

Chloride

Proposed Action and Rationale for Action

Gray Creek's chloride standard proposed most restrictive beneficial use is aquatic life. It is proposed to set the chloride Criteria to the most current recommended EPA Criteria from EPA 440/5-88-001, Ambient Water Quality Criteria for Chloride – 1988, of a 1-hour average of 860 mg/l and a 96-hour average of 230 mg/l which are not to be exceeded more than once in any three year period for protection of aquatic life.

Chloride is a natural mineral salt that is ubiquitous throughout the different Nevada hydrobasins. Natural factors such as an arid climate; periodic drought conditions; and evaporation processes can inherently increase the chloride concentrations in surface waters. Except for select terminal waterbodies (e.g., Humboldt Sink and Walker Lake), the chloride concentrations routinely measured in Nevada surface waters are generally below the proposed water quality standard and provides protection of freshwater fish, invertebrates and plants that are found in Nevada surface waters. Additionally, the Division's proposed Antidegradation Policy would minimize any anthropogenic changes in chloride concentrations from existing water quality levels that could impact resident aquatic life. This Criteria also protects for irrigation, municipal and domestic supply and propagation of wildlife Uses.

Discussion of Chloride Data

Gray Creek has a total of 44 samples with Chloride values ranging from 0 to 48 mg/l. No samples exceeded the proposed criteria.

Dissolved Oxygen

Proposed Action and Rationale for Action

It is proposed to return the Dissolved Oxygen criteria Gray Creek to ≥ 7 mg/l. This criteria also protects for watering of livestock, water contact recreation, water non-contact recreation and propagation of wildlife. Table 4 lists the standards for Gray Creek along with the proposed chloride and dissolved oxygen criteria.

Discussion of Dissolved Oxygen Data

Gray Creek has 25 Dissolved Oxygen samples ranging from 7.2 to 13.06 mg/l. No samples exceeded the proposed criteria.

Table 4. Water quality standards table for Gray Creek with proposed chloride and dissolved oxygen criteria. NAC 445A.1702. The limits of this table apply to the body of water known as Gray Creek from its origin to the Nevada State Line. Gray Creek is located in Washoe County.

STANDARDS OF WATER QUALITY

PARAMETER	REQUIREMENTS TO MAINTAIN EXISTING HIGHER QUALITY	WATER QUALITY STANDARDS FOR BENEFICIAL USES	Beneficial Use ^a												
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh		
Beneficial Uses			X	X	X	X	X	X	X	X					
Aquatic Life Species of Concern															
Temperature - °C		Avg. Jun-Sep ≤ 20.0 S.V. Summer ≤ 25.0 S.V. Winter ≤ 13.0			*	X									
pH - SU		S.V. 6.5 - 9	X	X	*	*		X	X	*					
Dissolved Oxygen - mg/l		S.V. ≥ 6.0 S.V. ≥ 7.0	X		*	X	X	X		X					
Total Phosphorus (as P) - mg/l		^b S.V. ≤ 0.1			*	*	X	X							
Nitrogen Species (as N) - mg/l		Nitrate S.V. ≤ 10	X				*		X						
		Nitrite S.V. ≤ 0.06	X		*		X		X						
		Total Nitrogen ^b			*	*									
Total Ammonia (as N) - mg/l		^c			*										
Total Dissolved Solids - mg/l		S.V. ≤ 500	X	X				*							
Chloride - mg/l		S.V. ≤ 250 1-hr. Avg. ≤ 860 ^d 96-hr. Avg. ≤ 230	X		*			* X		X					
Sulfate - mg/l		S.V. ≤ 250						*							
Turbidity - NTU		S.V. ≤ 10			*										
Color - PCU		S.V. ≤ 75						*							
E Coli - No./100 ml		AGM ≤ 126 S.V. ≤ 410				*	X								
Fecal Coliform - No./100 ml		S.V. ≤ 1000	*	*				X	X	*					

* = The most restrictive beneficial use.

X = Beneficial use.

^a Refer to NAC 445A.122 and 445A.1622 for beneficial use terminology.

^b Waters shall be free from nutrient concentrations from other than natural source that cause the growth of algae or aquatic plants in amounts that interfere with any beneficial uses of the water.

^c The ambient water quality criteria for ammonia are specified in NAC 445A.118.

^d **One-hour and 96-hour average concentration limits may be exceeded only once every 3 years.**

References

U.S. Environmental Protection Agency (USEPA). 1988. Ambient Water Quality Criteria for Chloride - 1988. Office of Water, Regulations and Standards. Washington, D.C. EPA-440/5-88-001.

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LCSN. 2010. NAC 445A.1698. Water Quality Standards, Bronco Creek. <http://www.leg.state.nv.us/NAC/NAC-445A.html#NAC445ASec1698>

LCSN. 2010. NAC 445A.1702. Water Quality Standards, Gray Creek. <http://www.leg.state.nv.us/NAC/NAC-445A.html#NAC445ASec1702>