

Upper Owyhee Watershed Assessment

Appendix F. Nevada TMDLs

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303(d) water bodies listed by the EPA or by the state.

Table F.1. Pollutants of concern for impaired water bodies in Nevada in the upper Owyhee subbasin. Water bodies are included either on the 303(d) federal list, in a TMDL, or in Nevada's administrative regulations.

Reasons for impairment

- | | |
|---------------------------|---------------------|
| a. Temperature | h. Arsenic |
| b. Sediment | i. Fluoride |
| c. Zinc | j. Manganese |
| d. Total dissolved solids | k. Nickel |
| e. Salinity | l. pH |
| f. Sulfates | m. Total phosphorus |
| g. Chlorides | |

Nevada waterbody	a	b	c	d	e	f	g	h	i	j	k	l	m
South Fork Owyhee River	x												
Jack Creek			x										
Jerritt Canyon Creek				x	x	x	x						
Snow Canyon Creek				x	x	x	x						
Mill Creek			x	x					x	x	x		
Badger Creek								x					
Owyhee River			x							x			
Tomasina Gulch								x					
Wildhorse Reservoir			x							x		x	x
	a	b	c	d	e	f	g	h	i	j	k	l	m

Nevada TMDLs

Some of the reaches of streams in the upper Owyhee subbasin have had Total Maximum Daily Loads (TMDLs) established by Nevada. These TMDLs are detailed in *Total Maximum Daily Loads for East Fork Owyhee River and Mill Creek*. In addition, a regulation proposed by the state environmental commission sets pollutant levels for the South Fork Owyhee River.

“The TMDLs and load allocations presented in this report are in a form unique for Nevada. Through the use of equations, the defined TMDLs and load allocations vary with flow thereby addressing the EPA requirement to consider seasonal variations and critical flow conditions in the TMDL process.”² The tables below include the pollutant

levels but do not include all of the formulas for changes in flow which are included in the Mill Creek and East Fork Owyhee assessment. The TMDL with formulas for the region can be acquired from the Department of Conservation and Natural Resources and in May 2011 was available at http://ndep.nv.gov/bwqp/owyhee_tmdl.pdf. The statewide formulas for calculating ammonia criteria are included at the end of this appendix.

Nevada considers the potential beneficial uses of a waterbody to be the watering of livestock, water supply for irrigation, habitat for fish and other aquatic life, recreation involving contact with the water, recreation not involving contact with the water, municipal or domestic water supply, industrial water supply, propagation of wildlife and waterfowl, extraordinary ecological or aesthetic value, and enhancement or improvement of water quality in any water which is downstream. In the tables these are labeled respectively livestock, irrigation, aquatic, contact, noncontact, municipal, industrial, wildlife, aesthetic, and enhance. In Tables F.2 through F.5, an x under one of the uses indicates that the use is a designated beneficial use for the waterbody.

Definitions used in the tables:

“S.V.” means single value.

“ ΔT ” means change in temperature in Celsius.

“ ΔpH ” means the change in pH.

“NTU” means nephelometric turbidity units, a measure of turbidity that is described in the sediment sources section of this assessment.

“PCU” means platinum cobalt unit, a measure of color.

“No./100ml” means the number of organisms present in 100 milliliters of the water.

“SU” means standard pH units.

“AGM” means annual geometric mean_____.

Table F.2. Nevada TMDL for the Owyhee River from Wildhorse Reservoir to its confluence with Mill Creek.

Parameter	Requirements to maintain existing higher quality	Water quality standards for beneficial uses	Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
Temperature - °C Maximum	$\Delta T=0$	S.V. May-Oct. <21° S.V. Nov.-Apr. <7° $\Delta T < 1$			X	X							
pH - Units	$\Delta \text{pH} \pm 0.5$	6.5 - 9.0			X	X		X					
Total Phosphorous (as P) - mg/l		≤ 0.1			X	X	X	X					
Nitrogen Species (as N) - mg/l	Nitrate S.V. <1.0	Nitrate S.V. ≤ 10 Nitrite S.V. ≤ 0.06			X	X	X	X					
Total Ammonia (as N) - mg/l		See formulas below			X								
Dissolved Oxygen - mg/l		≥ 6.0	X		X	X	X	X		X			
Suspended Solids - mg/l		S.V. ≤ 25			X			X					
Turbidity - NTU		S.V. ≤ 10			X			X					
Total Dissolved Solids - mg/l	S.V. ≤ 200	S.V. ≤ 500	X	X				X					
Chlorides - mg/l	S.V. ≤ 8.0	S.V. <250	X	X				X		X			
Sulfate - mg/l	S.V. ≤ 250							X					
Alkalinity (as CO ₃) - mg/l		<25% change from natural conditions			X					X			
E. coli - No./100 ml		AGM ≤ 126 S.V. ≤ 410				X	X						
Fecal Coliform - No./100ml		S.V. ≤ 1000	X	X			X	X		X			
Color - PCU		S.V. ≤ 75						X					
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh

Table F.3. Nevada TMDL for the Owyhee River from its confluence with Mill Creek to the border of the Duck Valley Indian Reservation.

Parameter	Requirements to maintain existing higher quality	Water quality standards for beneficial uses	Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
Temperature - °C Maximum	$\Delta T=0$	S.V. May-Oct. <21° S.V. Nov.-Apr. <7° $\Delta T < 1$			X	X							
pH - Units	$\Delta \text{pH} \pm 0.5$	6.5 - 9.0			X	X		X					
Total Phosphorous (as P) - mg/l		≤ 0.1			X	X	X	X					
Nitrogen Species (as N) - mg/l	Nitrate S.V. <1.0	Nitrate S.V. ≤ 10 Nitrite S.V. ≤ 0.06			X	X	X	X					
Total Ammonia (as N) - mg/l		See formulas below			X								
Dissolved Oxygen - mg/l		≥ 6.0	X		X	X	X	X		X			
Suspended Solids - mg/l		S.V. ≤ 25			X			X					
Turbidity - NTU		S.V. ≤ 10			X			X					
Total Dissolved Solids - mg/l	S.V. ≤ 250	S.V. ≤ 500	X	X				X					
Chlorides - mg/l	S.V. ≤ 8.0	S.V. <250	X	X				X		X			
Sulfate - mg/l	S.V. ≤ 250							X					
Alkalinity (as CO ₃) - mg/l		<25% change from natural conditions			X					X			
E. coli - No./100 ml		AGM ≤ 126 S.V. ≤ 410				X	X						
Fecal Coliform - No./100ml		S.V. ≤ 1000	X	X				X	X	X			
Color - PCU		S.V. ≤ 75						X					
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh

Table F.4. Nevada TMDL for the South Fork Owyhee River from its origin to the Nevada-Idaho state line.

Parameter	Requirements to maintain existing higher quality	Water quality standards for beneficial uses	Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh
Temperature - °C Maximum	$\Delta T=0$	S.V. May-Oct. <21° S.V. Nov.-Apr. <7° $\Delta T < 1$			X	X							
pH - Units	$\Delta \text{pH} \pm 0.5$	6.5 - 9.0			X	X		X					
Total Phosphorous (as P) - mg/l		≤ 0.1			X	X	X	X					
Nitrogen Species (as N) - mg/l	Nitrate S.V. <1.0	Nitrate S.V. ≤ 10 Nitrite S.V. ≤ 0.06			X	X	X	X					
Total Ammonia (as N) - mg/l		See formulas below			X								
Dissolved Oxygen - mg/l		≥ 6.0	X		X	X	X	X		X			
Suspended Solids - mg/l		S.V. ≤ 25			X			X					
Turbidity - NTU		S.V. ≤ 10			X			X					
Total Dissolved Solids - mg/l	S.V. ≤ 280	S.V. ≤ 500	X	X				X					
Chlorides - mg/l	S.V. ≤ 15.0	S.V. <250	X	X				X		X			
Sulfate - mg/l	S.V. ≤ 250							X					
Alkalinity (as CO ₃) - mg/l		<25% change from natural conditions			X					X			
E. coli - No./100 ml		AGM ≤ 126 S.V. ≤ 410				X	X						
Fecal Coliform - No./100ml		S.V. ≤ 1000	X	X			X	X		X			
Color - PCU		S.V. ≤ 75						X					
			Livestock	Irrigation	Aquatic	Contact	Noncontact	Municipal	Industrial	Wildlife	Aesthetic	Enhance	Marsh

Table F.5. Nevada TMDL for Taylor Canyon Creek from its origin to its confluence with the South Fork of the Owyhee River.

Parameter	Water quality standards for beneficial uses														
		Livestock Irrigation	Aquatic Contact	Noncontact Municipal	Industrial	Wildlife	Aesthetic Enhance	Marsh							
Temperature - °C Maximum	S.V. May-Oct < 21 S.V. Nov-Apr < 13			X	X										
pH - SU	S.V. 6.5 - 9.0			X	X		X								
Total Phosphorous (as P) - mg/l	S.V. ≤ 0.1			X	X	X	X								
Nitrogen Species (as N) - mg/l	Nitrate S.V. ≤ 10 Nitrite S.V. ≤ 0.06			X			X								
Total Ammonia (as N) - mg/l	See formulas below			X											
Dissolved Oxygen - mg/l	S.V. ≥ 6.0	X		X	X	X	X		X						
Suspended Solids - mg/l	S.V. ≤ 25			X			X								
Turbidity - NTU	S.V. ≤ 10			X			X								
Total Dissolved Solids - mg/l	S.V. ≤ 500	X	X				X								
Chlorides - mg/l	S.V. ≤ 250	X	X				X		X						
Sulfate - mg/l	S.V. ≤ 250						X								
E. coli - No./100 ml	A.G.M. ≤ 126 S.V. ≤ 410					X	X								
Fecal Coliform - No./100 ml	S.V. ≤ 1,000	X	X				X	X		X					
Color - PCU	S.V. ≤ 75						X								
		Livestock Irrigation	Aquatic Contact	Noncontact Municipal	Industrial	Wildlife	Aesthetic Enhance	Marsh							

Ammonia criteria for Nevada

1. Acute water quality criteria

For cold-water fisheries, the 1-hour average concentration of total ammonia, in milligrams of nitrogen per liter, must not exceed the applicable acute criterion for “Cold-Water Fisheries” more than once every 3 years on average.

$$\text{Acute water quality criteria for ammonia (cold-water fisheries)} = \left[\frac{0.275}{1+10^{7.204-\text{pH}}} \right] + \left[\frac{39.0}{1+10^{\text{pH}-7.204}} \right]$$

For warm-water fisheries, the 1-hour average concentration of total ammonia, in milligrams of nitrogen per liter, must not exceed the applicable acute criterion for “Warm-Water Fisheries” more than once every 3 years on average.

$$\text{Acute water quality criteria for ammonia (warm-water fisheries)} = \left[\frac{0.411}{1+10^{7.204-\text{pH}}} \right] + \left[\frac{58.4}{1+10^{\text{pH}-7.204}} \right]$$

2. Chronic water quality criteria

The chronic criteria of water quality with regard to the concentration of total ammonia are subject to the following:

The concentration of total ammonia, in milligrams of nitrogen per liter, expressed as a 30-day average must not exceed the applicable chronic criterion more than once every 3 years on average, and the highest 4-day average within the 30-day period must not exceed 2.5 times the applicable chronic criterion.

$$\text{Chronic water quality criteria for total ammonia} = \left[\frac{0.0577}{1+10^{7.204-\text{pH}}} \right] + \left[\frac{2.487}{1+10^{\text{pH}-7.204}} \right] \times \text{MIN}[2.85, 1.45 \times 10^{0.028 \times (25-T^{\circ})}]$$

A different criterion may be used only where documentation has been accepted showing the absence of freshwater fish in early life stages.

Bibliography

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3. Nevada Legislature. 2010. Chapter 445A - Water controls. In *State of Nevada Register of Administrative Regulations Volumes 1-158*. Retrieved 9/18/2010. <http://www.leg.state.nv.us/nac/NAC-445A.html#NAC445ASec028>