

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LAHONTAN REGION**

**MEETING OF MARCH 9-10, 2022  
VIDEO AND TELECONFERENCE ONLY**

<b>ITEM 8</b>
<b>WORKSHOP - DRAFT BASIN PLAN AMENDMENT FOR FECAL BACTERIA WATER QUALITY OBJECTIVES</b>

<b>CHRONOLOGY</b>	
November 9, 1995	Lahontan Water Board adopts the Water Quality Control Plan for the Lahontan Region (Basin Plan) with regionwide bacteria objective of 20 fecal coliform/100 mL applicable to all surface waters in the region. Previous Basin Plans applied the objective to ten specifically identified watersheds valuable as recreation and drinking water resources.
May 29, 2000	U.S. EPA approves 1995 Basin Plan. The approval letter indicates the Water Board should consider updating to an <i>E. coli</i> -based water quality objective.
November 12, 2014	Board agenda item presents a status report on bacteria sampling and analysis characterizing bacterial water quality across the region. The informational item includes discussion for the potential for future actions pertaining to bacteria water quality objectives by the State Water Board.
August 7, 2018	State Water Board adopts statewide <i>E. coli</i> bacteria water quality objective for the specific protection of the REC-1 beneficial use in all California surface waters where the use is designated (Resolution 2018-0038).
November 15, 2018	Lahontan Water Board adopts 2018 Triennial Review. Top basin planning priority identified to “Evaluate Bacteria Water Quality Objectives.”
January 13, 2021	Bacteria Water Quality Objectives Evaluation Project Board workshop.  Staff presented the history of fecal bacteria water quality objectives in the Lahontan Region, and the considerations staff used to evaluate these objectives as applicable to the Lahontan Region. Staff recommended pursuing a Basin Plan Amendment to update fecal bacteria regulations in the Region. Staff presented a variety of potential options for a Basin Plan amendment.
May 13, 2021	Bacteria Water Quality Objectives Evaluation Project Board workshop #2

## CHRONOLOGY

	<p>Staff returned to the Board to answer some outstanding questions about antidegradation considerations and beneficial uses, and presented further details on a possible Basin Plan amendment. The Board heard from several interested parties regarding possible project options. The Board gave direction to remove fecal coliform and associated objectives from the Basin Plan.</p>
October 14, 2021	<p>CEQA scoping meeting for <i>Fecal Bacteria Water Quality Objectives Basin Plan Amendment</i></p> <p>Staff held a CEQA scoping meeting to solicit public comment on the scope of the environmental analyses associated with the proposed Basin Plan amendment. The meeting was attended by 11 participants representing a variety of external agencies and the public. Staff received two written public comments (one contained in an email; one letter transmitted via email) and fielded two questions at the meeting about project logistics. The public comment period for CEQA Scoping ran from August 23<sup>rd</sup> to October 29<sup>th</sup>, 2021.</p>

## BACKGROUND

The top priority of the 2018 Triennial Review directed staff to evaluate the Lahontan Regions' fecal bacteria water quality objectives (WQOs). The evaluation project occurred in 2020, and staff presented the results of the evaluation to the Water Board in January 2021. Based on the evaluation, staff recommended that fecal coliform indicator bacteria and WQOs be removed from the Basin Plan. Fecal pollution of Lahontan Region surface waters would instead be evaluated using the narrative water quality objective and the State Water Board 2018 *Bacteria Provisions*, which apply to all California surface waters where the Water Contact Recreation (REC-1) use applies (including the Lahontan Region). The Bacteria Provisions are based on U.S. EPA recommended water quality criteria for the REC-1 use.

At the January 2021 workshop, staff proposed a selection of possible approaches for an amendment, some of which included developing new WQOs and/or beneficial uses designed to maintain the regions' high-quality waters. After a lengthy discussion about the proposals, including public comment from a variety of stakeholders, the Board asked staff to return with more information about several outstanding topics, including antidegradation and beneficial uses. Staff returned to the Board in May 2021 with more information about such topics and presented further details about a narrower set of approaches for the project. Water Board direction given at the May 2021 workshop led to the development of the proposed amendment.

## BACKGROUND

Details of all project options can be found in the [January 2021](#) and [May 2021](#) Board Packets. The May 2021 staff summary report, or “greensheet” includes a summary of the history of bacteria water quality objectives generally and in the Lahontan Region.

## ISSUES

There are no issues associated with this informational item. The item is presented to the Water Board to provide a status update of the Basin Plan amendment process.

## DISCUSSION

The proposed Basin Plan amendment removes the fecal coliform indicator and associated WQOs from Chapter 3 and Chapter 5 of the Basin Plan. The amendment also makes changes to the narrative objectives pertaining to fecal bacteria in each of these Basin Plan chapters. The narrative objectives are changed to reflect the state of the science pertaining to fecal pollution of surface waters and to provide objectives which may be applied to surface waters where the REC-1 use does not apply.

The proposed amendment includes additional changes to Chapters 3 and Chapter 5 of the Basin Plan to add language for a set of fecal bacteria WQOs to protect the Water Contact Recreation (REC-1) use in both fresh and saline surface waters. The WQOs already apply to Lahontan Region REC-1 surface waters with passage of the State Water Boards’ 2018 *Bacteria Provisions*. Further editorial changes are made to Chapters 3, 4, and 5 to remove references to fecal coliforms and log means, and replace this terminology with language related to the *Bacteria Provisions*.

The draft amendment language, Substitute Environmental Document (SED), and supporting staff report have been circulated for public comment. The public comment period is scheduled to close on April 15, 2022. Response to public comments and changes to the draft amendment language, SED, or staff report will be completed during 2022 ahead of a Board Hearing to adopt the proposed amendment currently scheduled for the November 2022 Water Board meeting.

No formal action is requested related to this informational item, although the Water Board may give direction to staff. Staff have prepared this item as an update to the Board regarding progress with this draft amendment and to provide the public with an opportunity to learn about the proposed documents during the comment period.

## SUSTAINABLE GROUNDWATER MANAGEMENT ACT BASINS

The focus of this project is water quality objectives in surface waters regionwide. It is a planning effort and does not focus on any one discharge or any specific groundwater basin.

## CLIMATE CHANGE RESPONSE

This Basin Plan amendment removes the outmoded fecal coliform indicator bacteria and associated WQOs from the Lahontan Basin Plan and inserts text for a set of fecal bacteria WQOs designed to protect the REC-1 beneficial use which already apply to Lahontan Region surface waters because of the State Water Board 2018 *Bacteria Provisions*. These WQOs are based off nationally recommended water quality criteria from U.S. EPA.

Setting and maintaining water quality objectives helps to support and protect beneficial uses. Protection of beneficial uses helps mitigate the effects of climate change. This Basin Plan amendment is consistent with [Resolution R6T-2019-0277](#), the Water Board's Climate Change Mitigation and Adaptation Strategy.

## PUBLIC OUTREACH

### December 2019 through May 2021

In anticipation of public interest in this project, staff worked with the Office of Public Participation (OPP) to engage interested parties throughout the region. Public engagement began with a listserv-distributed survey in January 2020. The survey received almost 80 responses, which helped staff draft a pre-COVID 19 pandemic outreach plan for the project comprised of in-person meetings held throughout the region.

Given the abrupt suspension to in-person meetings and general upheaval to society caused by the onset of the COVID-19 pandemic, in May 2020 staff sent out a second survey to gauge stakeholders ability to participate in the project given the COVID-19 pandemic. Staff received an overwhelming response that project work should continue. Based on this response, staff created a pre-recorded project presentation that was distributed to the Basin Planning listserv and posted online in July 2020. Two weeks later, staff hosted an online public workshop and question and answer session attended by nearly 40 participants. Project staff were joined in this effort by the generous participation of staff from OPP, the Office of Information Management and Analysis, and numerous Lahontan Water Board employees. Participants in the online workshop included private citizens, Water Board employees, and representatives from public agencies, interest groups, and two native American tribes. Details of all the public outreach efforts are included in the [January 2021 Board Packet](#) for the Bacteria Water Quality Objectives Evaluation Project.

In preparation for the May 2021 Board workshop, staff met with several project stakeholders to discuss possible options for a Basin Plan Amendment for fecal bacteria water quality objectives. Those meetings provided a forum for staff to answer questions about the evaluation project and hear from interested parties about what topics specific to fecal bacteria water quality objectives were important to them.

**October 2021 CEQA scoping**

Notice of the public CEQA scoping comment period was circulated on August 23<sup>rd</sup>, 2021. The comment window closed on October 29<sup>th</sup>, 2021. On October 14, 2021 staff held a public meeting to solicit public input regarding the scope of environmental analyses to be performed in preparation of the Basin Plan amendment. This meeting was prepared in accordance with CEQA and provided opportunity for stakeholders and members of the public to ask staff process-related questions and provide verbal comments about the project. Written comments were solicited and encouraged, and the deadline for receipt of written comments was Friday, October 29, 2021 at 5:00 p.m.

The scoping meeting was attended by eleven interested parties, several of whom asked staff process-related questions. During the meeting one email comment was received opposing the removal of fecal coliform WQO from the Basin Plan. This comment was read into the record. One comment letter in support of removing fecal coliform from the Basin Plan was received during the comment period. Staff considered the contents of all comments during preparation of the BPA and development of the SED and supporting staff report.

The CEQA scoping meeting was originally planned for September 2021. The meeting was postponed to October 2021 because of the emergency closure of the Water Boards' South Lake Tahoe office due to the Caldor Fire evacuations. Staff also extended the written comment period because of the Caldor Fire.

**Circulation of Basin Plan amendment, SED, and staff report**

The draft Fecal Bacteria Water Quality Objectives Basin Plan Amendment and this supporting Staff Report and SED were circulated for a 45-day public review together with the Water Board March meeting agenda packet on February 23, 2022. Public comments on all circulated materials are encouraged. The deadline to submit comments related to the draft amendment is Monday, April 15, 2022 at 5 p.m.

**PRESENTERS**

Ed Hancock, Environmental Scientist

**RECOMMENDATION**

This is an informational item and there is no associated recommendation.

<b>ENCLOSURE</b>	<b>ITEM</b>	<b>BATES NUMBER</b>
<b>1</b>	Draft - Basin Plan amendment staff report and Substitute Environmental Document (SED)	<b>8 - 6</b>
<b>2</b>	Full text of draft proposed Basin Plan Amendment	<b>8 - 48</b>

# **ENCLOSURE 1**

# DRAFT

## TECHNICAL STAFF REPORT & SUBSTITUTE ENVIRONMENTAL DOCUMENT

AMENDMENTS TO THE WATER QUALITY CONTROL PLAN FOR THE  
LAHONTAN REGION

### FECAL BACTERIA WATER QUALITY OBJECTIVES

State Clearinghouse Number XXXXX

California Regional Water Quality Control Board, Lahontan Region  
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February 2022

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## 1. Introduction

This staff report and Substitute Environmental Document (SED) provides the technical background and basis for a Basin Plan amendment (BPA) to the [Water Quality Control Plan for the Lahontan Region](#) (Basin Plan) bacteria water quality objectives (WQOs). The BPA includes revisions to the two bacteria water quality objectives and several editorial changes to the text of the Basin Plan. The amendment includes the deletion of fecal coliform fecal indicator bacteria (FIB) and its associated WQOs, and amendments to the narrative objective for fecal bacteria which is applicable to all surface waters. Editorial changes include the insertion of language referencing a set of fecal bacteria WQOs that are effective statewide and were established by the State Water Resources Control Board (State Board), revisions to text related to terminology about the bacteria objectives contained in Chapter 3 and Chapter 5 of the Basin Plan, and appropriate changes to title pages, tables of contents, appendices, page numbers, table and figure numbers, footnote numbers, and headers and footers.

The Lahontan Regional Water Quality Control Board (Water Board) is the state agency responsible for water quality protection in California watersheds east of the Sierra Nevada Crest from the Modoc Plateau in the north to the Mojave Desert in the south. The Water Board is one of nine Water Quality Control Boards throughout California that function as part of the State Water Resources Control Board (State Water Board) system within the California Environmental Protection Agency. The Water Board implements both the federal Clean Water Act (CWA) and the Porter-Cologne Water Quality Control Act. Water quality standards and control measures for waters of the Lahontan Region are contained in the Basin Plan.

Section 303 of the federal CWA defines water quality standards as the designated uses of a waterbody and the water quality criteria applied to protect those uses. Under the Porter-Cologne Water Quality Control Act (CA Water Code § 13000 et seq.), beneficial uses and water quality objectives (WQOs) to protect those beneficial uses are established for all surface waters, wetlands, and ground waters of the State.

The Water Board's Basin Plan contains two WQOs under the 'Bacteria, coliform' headings of [Chapter 3 \(Water Quality Objectives\)](#) and [Chapter 5 \(Water Quality Standards and Control Measures for the Lake Tahoe Basin\)](#). The WQOs in each chapter use fecal coliform as the FIB. The WQOs of Chapter 3 are applicable to all Lahontan Region surface waters regardless of beneficial use; the WQOs of Chapter 5 are applicable to all surface waters of the Lake Tahoe Basin regardless of beneficial use.

Fecal coliforms are no longer a recommended FIB to determine if potentially harmful fecal material may be present in surface waters ([United States Environmental Protection Agency \(U.S. EPA\), 1986, 2012](#)). Instead, *Escherichia Coli* (*E. coli*) and Enterococci FIB are recommended as indicators of this type of waste in freshwater surface waters (*Ibid*, 1986, 2012).

In 2018, the State Water Board adopted [Resolution No. 2018-0038](#), which established [Part 3 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries \(ISWEBE\) – Bacteria Provisions and a Water Quality Standards Variance Policy \(Bacteria Provisions\)](#). The *Bacteria Provisions* include *E. coli* and Enterococci FIB WQOs for the Water Contact Recreation (REC-1) beneficial use. These WQOs apply to all surface waters in California designated with the REC-1 use, including the Lahontan Region, and superseded numeric water quality objectives for bacteria for the REC-1 beneficial use that were contained in Basin Plans prior to February 4, 2019.

To be consistent with U.S. EPA FIB recommendations, the proposed amendment removes the fecal coliform indicator and associated WQOs from the ‘Bacteria, coliform’ heading in Chapters 3 and 5 of the Basin Plan. The proposed amendment makes additional editorial changes to the ‘Bacteria, coliform’ headings and subsequent language, including inserting language referencing the State Water Board *Bacteria Provisions*, which already apply to Lahontan Region surface waters. Detailed information pertaining to the *Bacteria Provisions*, including the [Staff Report and SED](#) for that project, can be found at the [State Water Board website](#). Editorial changes associated with this BPA were made to improve the readability and clarity of the Lahontan Region Basin Plan.

This staff report and SED provide supporting information and justification for the BPA that would remove the fecal coliform WQO, revise the narrative fecal bacteria objectives, and make editorial changes to summarize the *Bacteria Provisions* WQOs in the Basin Plan. The staff report includes a discussion on the need for the BPA, technical information to support the BPA, and considerations in accordance with the California Water Code and California Environmental Quality Act (CEQA). The Staff Report also provides a record of the process used to develop the BPA, including the environmental review, the public participation process, and scientific peer review.

The Water Board’s planning process has been certified by the Secretary for Resources under Section 21080.5 of CEQA as “functionally equivalent” to the preparation of an Environmental Impact Report (EIR). This certification allows the Water Board to prepare an SED rather than a negative declaration or EIR for BPAs. Therefore, the Staff Report includes the SED for compliance with CEQA, and a separate CEQA document will not be prepared. The Staff Report includes the Water Board’s Substitute Environmental Documentation (SED) required to satisfy the provisions of the CEQA, pursuant to Public Resources Code sections 21080.5 and 21159, CEQA Guidelines sections 1520 through 15253, and the Water Board’s Regulations for Implementation of the California Environmental Quality Act of 1970, California Code of Regulations (Cal. Code of Regs), title 23, sections 3720 through 3781. The document must contain a brief description of the project, an identification of any significant or potentially significant adverse environmental impacts of the proposed project, an analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts, and an environmental analysis of the reasonably foreseeable methods of compliance, and must be circulated for a public review period.

## 2. Statement of Necessity for a Basin Plan Amendment

The [Basin Plan](#) contains fecal coliform WQOs that are generally applicable to all surface waters in the Lahontan Region. Fecal coliforms are no longer a recommended FIB to show water quality is compromised by fecal material ([U.S. EPA, 2012](#)). Instead, U.S. EPA recommends *E. coli* and Enterococci FIB to detect fecal pollution in surface waters and indicate when recent, harmful fecal pollution may be present (*Ibid*, 2012).

As further described in this Staff Report, a BPA is necessary to remove the fecal coliform FIB WQOs from the Basin Plan to reflect U.S. EPA recommendations on fecal indicators. Fecal coliforms have been faulted because of the non-fecal sources of at least one member of this group, *Klebsiella*, which have been observed in effluents of a number of industrial processes and in the absence of fecal contamination (U.S. EPA, 1986). The fecal coliform WQOs are located in [Chapter 3 \(Water Quality Objectives\)](#) and [Chapter 5 \(Water Quality Standards and Control Measures for the Lake Tahoe Basin\)](#).

The BPA also updates the narrative FIB WQO in Chapters 3 and 5 of the Basin Plan. Updating the narrative WQO is necessary to remove references to ‘coliform organisms,’ replacing instead with ‘fecal material,’ and to modernize the language of the Basin Plan to reflect the state-of-the-science and ensure protection of beneficial uses. Coliform organisms may originate from nonfecal sources, compromising their accuracy as an indicator of fecal pollution. Changes to the narrative WQO are explained in [Section 5.1](#) of this report.

### 2.1 Scope and summary of the Basin Plan Amendment

This amendment removes the fecal coliform WQO collocated in Basin Plan Chapter 3-4 and 3-6, and Chapter 5.1-6. The amendment changes the narrative FIB WQO in Chapter 3-4 and Chapter 5.1-6. The amendment adds language to Chapter 3-4 and Chapter 5.1-6 from State Board Resolution No. 2018-0038 *Bacteria Provisions* for *E. coli* and Enterococci FIB WQOs. The amendment changes language related to implementation of bacteria objectives in Chapter 3-16 and Chapter 5.1-12. The amendment also removes references to fecal coliforms for Chapter 4.9-19.

Additionally, the BPA includes editorial changes to both Chapters 3 and 5 of the Basin Plan pertaining to the statewide REC-1 bacteria provisions. Editorial changes are also made to the ‘Bacteria, Coliform’ headings found in Chapters 3 and 5. Further language is added that describes the methodology for determining adherence to the WQO.

A full explanation of the changes to the Basin Plan are found in [Section 5](#) of this report. The full textualization for the BPA is included as the draft Fecal Bacteria Water Quality Objectives Basin Plan Amendment developed for this project, available on the Lahontan Water Boards’ [Basin Planning webpage](#).

### 3. Regulatory Overview

The Lahontan Water Board is the primary California state agency responsible for setting and enforcing water quality standards in the [Lahontan Region](#). Water quality standards and a program of implementation for surface waters and groundwaters of the Lahontan Region are identified in the Basin Plan. Amendments to the Basin Plan, including amendments adopting new or revising existing water quality standards for surface waters, are subject to a public process with multiple opportunities for public comment. Basin Plan amendments become effective for state law and non-CWA implementation purposes after adoption by resolution by the Water Board, approval by the State Water Board, and approval by the California Office of Administrative Law (OAL). Basin Plan Amendments become effective for CWA implementation purposes after adoption by the Water Board, approval by the State Water Board, approval by OAL and approval by the U.S. EPA, Region IX.

Water quality standards generally consist of three components: designated uses for each water body or segment, water quality criteria to protect the designated uses, and an antidegradation policy (40 C.F.R. §131.6; 40 C.F.R. §131.13). In general, “uses” refer to what a water body is or potentially may be used for (40 C.F.R. § 131.3(f)), with examples as diverse as use as wildlife and riparian habitat, use of water for industrial production, agricultural supply, or use for recreation due to activities such as fishing and swimming in waterbodies (40 C.F.R. 131.10(a)).

Most, if not all, waterbodies have multiple uses. “Existing uses” are “those uses actually attained in the water body on or after November 28, 1975, whether or not they are included in the water quality standards” (40 C.F.R. § 131.3(e)). “‘Designated uses’ are those uses specified in water quality standards for each water body or segment whether or not they are being attained” (40 C.F.R. § 131(f)). “Water quality criteria” are “expressed as constituent concentrations, levels, or narrative statements, representing a quality of water that supports a particular use” (40 C.F.R. § 131.3(b)). The Federal Antidegradation policy provides three levels (tiers) of water quality protection to maintain and protect existing water uses, high quality waters, and outstanding national resource waters (40 C.F.R. § 131.12.).

The Porter-Cologne Water Quality Control Act (Wat. Code § 13000 et seq.) is the principal law governing water quality in California. California law designates the State Water Board and the nine Regional Water Boards as the principle state agencies for enforcing federal and state water pollution law. (Wat. Code, §§ 13140, 13160, 13225, 13240.). The Porter-Cologne Water Quality Control Act establishes a comprehensive statutory program to protect the quality and “beneficial uses” (or “designated uses” under federal parlance) of waters of the state. Beneficial uses include, but are not limited to, “domestic, municipal, agricultural, and industrial supply; power generation; recreation; aesthetic enjoyment; navigation; and preservation and enhancement of fish, wildlife, and other aquatic resources or preserves.” (Wat. Code, § 13050, subd.(f)). Water Quality Objectives are “the limits or levels of water quality constituents or characteristics which are established for the reasonable protection of beneficial uses of

water or the prevention of nuisance within a specific area.” (Wat. Code, § 13050, subd.(h)).

Chapter 2 of the Basin Plan identifies the Beneficial Uses and designates beneficial uses to water bodies in the Lahontan Region. Chapter 3 of the Basin Plan identifies the water quality objectives that apply to waters of the State within the Lahontan Region. Chapter 5 identifies the water quality standards and control measures for the Lake Tahoe Basin.

Regional Water Boards are required to establish water quality control plans (Basin Plans) for all areas within their Regions (Wat. Code, §13240), and must establish water quality objectives in Basin Plans that will ensure the reasonable protection of beneficial uses and the prevention of nuisance (Wat. Code § 13241).

#### **4. Existing Conditions/Environmental Setting**

The Lahontan Region is defined in terms of drainage basins by Section 13200(h) of the Porter-Cologne Act. The Region is approximately 570 miles long and has a total area of 32,792 square miles.

The Lahontan Region includes the highest (Mount Whitney) and lowest (Death Valley) points in the contiguous United States, and the topography of the remainder of the Region is diverse. The Region includes the eastern slopes of the Warner Mountains and the Sierra Nevada, the northern slopes of the San Bernardino and San Gabriel Mountains, the southern slopes of the Tehachapi Mountains, and all or part of other ranges including the White, Providence, and Granite Mountains and the western slopes of the New York and Ivanpah Mountains. Topographic depressions include the Madeline Plains, Surprise, Honey Lake, Bridgeport, Owens, Antelope, and Victor Valleys.

The geology and soils of the Lahontan Region have been shaped by a variety of processes and are correspondingly diverse. Parent materials in the northern mountains are granitic or volcanic; evidence of glacial action is widespread. Soils in the desert valleys of the Region are derived from alluvium. Severe seismic activity has occurred in the past; the Owens Valley earthquake of 1872 formed a 20-foot fault scarp, and earthquakes in the Mammoth area have recently damaged sewer lines. Volcanic activity has occurred recently (in geologic time) in the Mono Lake area, and the presence of geothermal springs throughout the Lahontan Region indicates that it could occur in the future. Economically valuable minerals, including gold, silver, copper, sulfur, tungsten, borax, and rare earth metals, have been or are being mined at various locations within the Region.

The Lahontan Region also has a variety of climates. The Region is generally in a rain shadow; however, precipitation amounts can be high (up to 70 inches) at higher elevations. Most precipitation in the mountainous areas falls as snow. Desert areas receive relatively little annual precipitation (less than 2 inches in some locations,) but this can be concentrated and lead to flash flooding. Recorded temperature extremes in

the Lahontan Region range from -45 degrees Fahrenheit at Boca in the Truckee River watershed to 134 degrees Fahrenheit in Death Valley.

The varied topography, soils, and microclimates of the Lahontan Region support a corresponding variety of plant and animal communities. Vegetation ranges from sagebrush and creosote bush scrub in the desert areas to pinyon-juniper and mixed conifer forest at higher elevations. Subalpine and alpine “cushion plant” communities occur on the highest peaks. Wetland and riparian plant communities, including marshes, meadows, “sphagnum” bogs, riparian deciduous forest, and desert washes, are particularly important for wildlife, given the general scarcity of water in the Region.

The existence of “ecological islands,” because of topography, glaciation, and climatic changes, has led to the evolution of species, subspecies, and genetic strains of plants and animals in the Lahontan Region which are found nowhere else. Particularly notable are fish such as the Eagle Lake trout, Lahontan and Paiute cutthroat trout, Mojave chub, and several kinds of desert pupfish.

The Lahontan Region is rich in cultural resources (archaeological and historic sites). These range from remnants of Native American irrigation systems to Comstock mining era ghost towns such as Bodie, and 1920s resort homes at Lake Tahoe and Scotty's Castle at Death Valley.

Much of the Lahontan Region is in public ownership, with land use controlled by agencies such as the U.S. Forest Service, National Park Service, and Bureau of Land Management, various branches of the military, the California State Department of Parks and Recreation, and the City of Los Angeles Department of Water and Power. While the permanent resident population of the Region is low in relation to that of more urbanized Regions, most of it is concentrated in high density communities in the South Lahontan Basin. In addition, millions of visitors use the Lahontan Region for recreation each year. Rapid population growth has occurred recently and is expected to continue in the Victor and Antelope Valleys and within commuting distance of Reno, Nevada. Principal communities of the North Lahontan Basin include Susanville, Truckee, Tahoe City, South Lake Tahoe, Markleeville, and Bridgeport. The South Lahontan Basin includes the communities of Mammoth Lakes, Bishop, Ridgecrest, Mojave, Adelanto, Palmdale, Lancaster, Victorville, and Barstow.

Recreational and scenic attractions of the Lahontan Region include Eagle Lake, Lake Tahoe, Mono Lake, Mammoth Lakes, Death Valley, and portions of many wilderness areas. Segments of the East Fork Carson and West Walker Rivers are included in the State Wild and Scenic River system. Both developed (e.g., camping, skiing, day use) and undeveloped (e.g., hiking, fishing) recreation are important components of the Region's economy.

In addition to tourism, other major sectors of the economy are resource extraction (mining, energy production, and silviculture), agriculture (mostly livestock grazing), and defense-related activities. There is relatively little manufacturing industry in the Region in comparison to major urban areas of the state.

In preparation of the California Integrated Report – Clean Water Act (CWA) Section 303(d) List of Impaired Waters and CWA Section 305(b) Surface Water Quality Assessment (Integrated Report), data and information were collected from Lahontan Region surface waters. The [Lahontan Regional Water Quality Control Board Clean Water Act Sections 305\(b\) And 303\(d\) 2018 Integrated Report for the Lahontan Region Staff Report](#) summarized the assessment processes and the methods used in the integrated report cycle. The Staff Report indicates that headwater streams flowing eastward from the Sierra Nevada Crest typically have low concentrations of indicator bacteria detectable in water quality samples, although these concentrations usually increase as the waterbodies flow downgradient into the lower elevation portions of the region. Waterbodies in lower elevation areas are typically subject to greater impacts from anthropogenic activities and from natural sources, and these waters also receive proportionally more recreational activity when compared to headwater sites. At headwater sites with little or no regular anthropogenic disturbance the available FIB data indicates that Lahontan waters are of exceptional quality, by far attaining the statewide WQOs for the REC-1 beneficial use.

Fecal bacteria water quality in most of the Regions' surface waters can be described as excellent, meaning little FIB is usually detected during routine monitoring. Most headwaters portions of the Region have not been developed for residential or industrial use, and because much of the surface water in the Region comes from snowmelt, Lahontan Region waters are of excellent quality. In areas where industrial agriculture (such as livestock grazing), urbanization, and certain forms of recreation occur, fecal bacteria is more likely to occur and be detected, especially during warmer months of the year when grazing and recreation uses are at their peak. The Water Board continues to work with stakeholders to address fecal waste issues in watersheds.

## 5. Proposed Revisions to the Basin Plan/Project Description

A full copy of the revisions to the Basin Plan are included in the Fecal Bacteria Water Quality Objectives Basin Plan Amendments developed for this project, available on the Lahontan Water Boards' [Basin Planning webpage](#). This section explains the content of the BPA, including Sections 5.1 through 5.6 which explain the changes to each part of the Basin Plan, and Section 5.7 which provides a summary of different implementation components associated with the REC-1 FIB WQOs of the *Bacteria Provisions*. The *Bacteria Provisions* should be consulted in their entirety for all details related to the REC-1 FIB WQOs.

### 5.1 Changes to *narrative 'Bacteria, Coliform'* objectives in Chapter 3, page 4

The subheading '*Bacteria, Coliform*' found on page 4 is changed to '*Fecal Indicator Bacteria*'. The narrative text found under this subheading is changed from:

*Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.*

To:



*Waters shall not contain concentrations of fecal material deleterious to beneficial uses.*

*Compliance with the narrative bacteria water quality objectives may be determined by use of Fecal Indicator Bacteria (FIB) water quality monitoring, such as Escherichia Coli (E. coli) or Enterococci, genetic testing, or other appropriate methods.*

Changing 'coliform organisms' to 'fecal material' & inclusion of two additional sentences

The purpose of this change is to remove the limitations associated with 'coliform organisms' and expand the narrative WQO to 'fecal material' in recognition of the variety of modern approaches to determine the presence of fecal wastes in surface waters. Changing the narrative WQO in this manner removes the restriction on the types of fecal water quality monitoring that may be used to determine compliance with the narrative WQO. Potential different types of water quality monitoring methodology are described in the second and third sentence of the amendment language although this language is not exhaustive, and types of water quality monitoring not explicitly mentioned in the text may be used to determine compliance with the narrative WQO.

Research related to fecal waste and detection in surface waters is continually expanding and now includes genetic methods capable of determining and quantifying sources of fecal waste. Identification of sources of fecal material and quantification of that source provides crucial information to understand the illnesses risks associated with specific contamination issues.

While there are no fecal waste WQOs approved by U.S. EPA which are specific to fecal material source, research in this field is continually evolving. Should source specific or other fecal waste criteria be developed in the future, the changes to the narrative WQO made with this amendment provides the scope to apply those thresholds.

Removing 'attributable to anthropogenic sources, including human and livestock wastes'

The amendment removes the association of the fecal waste to anthropogenic sources. Non-anthropogenic sources also produce FIB and may also produce harmful pathogens and viruses which could cause sickness in people. *E. coli* and Enterococci, which are amongst the most used FIB, do not differentiate by source without also using genetic tracking methods.

Addition of 'deleterious to beneficial uses'

The language '*fecal material deleterious to beneficial uses*' is inserted so the narrative WQO is applicable in a variety of situations and to all Lahontan Region beneficial uses in surface waters. This addition helps the Water Board to address a myriad of feces-related water quality issues, including situations where surface waters may be affected by fecal waste not rising to the level that exceeds the WQOs of the *Bacteria Provisions*.

The addition of '*fecal material deleterious to beneficial uses*' provides scope for the Water Board to apply new fecal water quality evaluation guidelines or thresholds if they are published in the future. Any new guidelines would be applied in addition to those found in the *Bacteria Provisions*. Evaluation guidelines may be published for beneficial uses other than REC-1, and the Water Board may choose the most appropriate beneficial use and evaluation guideline for the situation at hand.

The addition of '*deleterious to beneficial uses*' enables the Water Board to apply the narrative FIB WQO to the small subset of Lahontan surface waters where the REC-1 use does not apply. Removing the fecal coliform WQOs (explained in [Section 5.2](#)) from the Basin Plan leaves non-REC-1 waters without a numeric WQO for fecal bacteria because the *Bacteria Provisions* only apply to REC-1 waters. The new narrative WQO explained in this section is applicable to all beneficial uses and all surface waters, including non-REC-1 waters. An appropriate evaluation guideline will be selected for the relevant beneficial use at the time of WQO implementation in non-REC-1 surface waters.

### 5.2 Removal of the fecal coliform WQO from Basin Plan Chapter 3

All language related to fecal coliforms is removed from Chapter 3 of the Basin Plan. Fecal coliforms are not recommended as an accurate FIB for the presence of fecal waste of surface waters (U.S. EPA, 1986, 2012). This BPA removes all fecal coliform language found in Basin Plan Chapter 3, page 4:

*The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml. The log mean shall ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 ml for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.*

Language referencing the *Bacteria Provisions*, which established *E. coli* and Enterococci WQO's for the REC-1 beneficial use in all California surface waters and which are already effective in the Lahontan Region, will be added to the Basin Plan. These additions are described in [Sections 5.3](#).

#### 5.2.1 Removal of fecal coliform WQO from the Susanville Hydrologic Unit

This BPA also removes all fecal coliform language (including the subheading) found on Chapter 3, page 6, relating to specific objectives for the Susanville Hydrologic Unit:

##### ***Bacteria, Fecal Coliform***

*The fecal coliform concentration based on a minimum of not less than five samples for any 30- day period, shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of total samples during any 30-day period exceed 75/100 ml.*

No new language related to FIB WQOs will be added for the Susanville Hydrologic Unit. All waters in the Susanville Hydrologic Unit are designated the REC-1 beneficial use and thus the statewide *E. coli* and Enterococci WQOs already apply to these waters. The narrative water quality objective also applies to the Susanville Hydrologic Unit.

### 5.3 Additions to Chapter 3 of *E. coli* and Enterococci FIB WQOs for REC-1 waters

Under the new '*Fecal Indicator Bacteria*' heading, below the narrative objective text described in [Section 5.1](#), the following text is inserted:

#### *Surface waters designated for Water Contact Recreation (REC-1):*

*The State Water Resources Control Board (State Water Board) established two bacteria water quality objectives applicable to all surface waters with the REC-1 beneficial use, depending on the salinity level, and an implementation plan in 'Part 3 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California — Bacteria Provisions and a Water Quality Standards Variance Policy' (Bacteria Provisions)' adopted with State Water Board Resolution No. 2018-0038. The Bacteria Provisions should be consulted in their entirety for a complete accounting of the water quality objectives and associated implementation provisions. The water quality objectives are summarized below.*

#### *Escherichia Coli (E. coli)*

*The bacteria water quality objective for all waters where the salinity is equal to or less than 1 part per thousand (ppt) 95 percent or more of the time during the calendar year is: a six-week rolling geometric mean (GM) of *E. coli* not to exceed 100 colony forming units (cfu) per 100 milliliters (mL), calculated weekly, and a Statistical Threshold Value (STV) of 320 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.*

*United States Environmental Protection Agency (U.S. EPA) recommends using U.S. EPA Method 1603 or other equivalent method to measure culturable *E. coli*.*

#### *Enterococci*

*The bacteria water quality objective for all waters where the salinity is greater than 1 ppt more than 5 percent of the time during the calendar year is: a six-week rolling geometric mean of enterococci not to exceed 30 cfu/100 mL, calculated weekly, with a STV of 110 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.*

*U.S. EPA recommends using U.S. EPA Method 1600 or other equivalent method to measure culturable enterococci.*

**Table 3 - 0. REC-1 Bacteria Water Quality Objectives**

<b>Applicable Waters</b>	<b>Objective Elements</b>	<b>Estimated Illness Rate (NGI): 32 per 1,000 water contact recreators Magnitude (cfu/100 ml)</b>	
	<i>Indicator</i>	<i>GM</i>	<i>STV</i>
<i>All waters where the salinity is equal to or less than 1 ppt 95 percent or more of the time</i>	<i>E. coli</i>	100	320
<i>All waters where the salinity is greater than 1 ppt more than 5 percent of the time</i>	<i>Enterococci</i>	30	110

*Table notes:*

1. *The waterbody GM shall not be greater than the applicable GM magnitude in any six-week interval, calculated weekly. The applicable STV shall not be exceeded by more than 10 percent of the samples collected in a CALENDAR MONTH, calculated in a static manner.*
2. *NGI = National Epidemiological and Environmental Assessment of Recreational Water gastrointestinal illness rate*
3. *GM = geometric mean*
4. *STV = statistical threshold value*
5. *cfu = colony forming units*
6. *ppt = parts per thousand*
7. *ml = milliliters*

The WQO language and WQO table is copied from the *Bacteria Provisions*. The WQOs already apply to Lahontan Region surface waters. This part of the amendment is an editorial (i.e., non substantive) change.

5.4 Removal of text related to ‘log mean’ and changes to ‘bacterial analysis’ text, and addition of definitions for ‘geometric mean’ and ‘statistical threshold value’ from Chapter 3-16

The heading:

*“References to “Means” (e.g., annual mean, log mean, mean of monthly means), “Medians” and “90th Percentile Values”*

is changed to remove references to ‘log mean.’ ‘Log mean’ is replaced with ‘geomean,’ and the text ‘and Statistical Threshold Values’ is inserted at the end of the sentence.

The following additional text on page 3-16 column one is also removed:

*A logarithmic or “log mean” (used in determining compliance with bacteria objectives) is calculated by converting each data point into its log, then*

*calculating the mean of these values, then taking the anti-log of this log transformed average.*

This text pertaining to geometric means is inserted in place of the deleted text:

*A geometric mean or “geomean” (used in determining compliance with bacteria objectives) is a type of mean that indicates the central tendency or typical value of a set of numbers by using the product of their values (as opposed to the arithmetic mean which uses their sum). The geometric mean is defined as the  $n$ th root of the product of  $n$  numbers. The formula is expressed as:  $GM = \sqrt[n]{(x_1)(x_2)(x_3) \dots (x_n)}$ , where  $x$  is the sample value and  $n$  is the number of samples taken.*

At the end of the “References to “Means” (e.g., annual mean, geomean, mean of monthly means), “Medians” and “90th Percentile Values,” and Statistical Threshold Values’ paragraph, the following definition for statistical threshold values is inserted:

*A statistical threshold value (STV) for the fecal indicator bacteria water quality objectives is a set value that approximates the 90th percentile of the water quality distribution of a bacterial population.*

On page 3-16, column 2, the following text from the paragraph ‘bacterial analyses’ is removed:

*For bacterial analyses, sample dilutions should be performed so the range of values extends from 2 to 16,000. The detection method used for each analysis shall be reported with the results of the analysis. Detection methods used for coliforms (total and fecal) shall be those presented in Standard Methods for the Examination of Water and Wastewater (American Public Health Association et al. 1998), or any alternative method determined by the Regional Board to be appropriate.*

The following text is inserted to page 3-16, column 2:

*For bacterial analyses, the detection method used for each analysis shall be reported with the results of each analysis. Detection methods used for fecal indicator bacteria (FIB) shall be those presented in Standard Methods for the Examination of Water and Wastewater (American Public Health Association et al.), or any alternative method determined by the Regional Board to be appropriate.*

## 5.5 Removal of fecal coliform WQO and changes to Basin Plan Chapter 5.1

Basin Plan Chapter 5 provides WQOs for the Lake Tahoe Basin. This BPA removes the fecal coliform indicator and associated WQOs from Chapter 5 – 6 because these FIB are not recommended to indicate the presence of fecal waste of surface waters (U.S. EPA, 1986, 2012). This BPA also changes to the ‘*Bacteria, Coliform*’ heading and associated narrative objective contained in Chapter 5.

The '*Bacteria, Coliform*' heading is changed to '*Fecal Indicator Bacteria*'. The narrative text found under this subheading is changed from:

*Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.*

To:

*Waters shall not contain concentrations of fecal material deleterious to beneficial uses.*

*Compliance with the narrative bacteria water quality objectives may be determined by use of Fecal Indicator Bacteria (FIB) water quality monitoring, such as Escherichia Coli (E. coli) or Enterococci, genetic testing or other appropriate methods*

These changes are the same as those made to Chapter 3. Explanation for the changes is found in [Section 5.1](#).

The following text pertaining to fecal coliforms is removed:

*The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml. The log mean shall ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 ml for any 30- day period shall indicate violation of this objective even if fewer than five samples were collected.*

In place of the removed text, the following text is inserted:

*Surface waters designated for Water Contact Recreation (REC-1):*

*The State Water Resources Control Board (State Water Board) established two bacteria water quality objectives applicable to all surface waters with the REC-1 beneficial use, depending on the salinity level, and an implementation plan in 'Part 3 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California — Bacteria Provisions and a Water Quality Standards Variance Policy' (Bacteria Provisions)' adopted with State Water Board Resolution No. 2018-0038. The Bacteria Provisions should be consulted in their entirety for a complete accounting of the water quality objectives and associated implementation provisions. The water quality objectives are summarized below.*

*Escherichia Coli (E. coli)*

*The bacteria water quality objective for all waters where the salinity is equal to or less than 1 part per thousand (ppt) 95 percent or more of the time during*

*the calendar year is: a six-week rolling geometric mean (GM) of E. coli not to exceed 100 colony forming units (cfu) per 100 milliliters (mL), calculated weekly, and a Statistical Threshold Value (STV) of 320 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.*

*United States Environmental Protection Agency (U.S. EPA) recommends using U.S. EPA Method 1603 or other equivalent method to measure culturable E. coli.*

*Enterococci*

*The bacteria water quality objective for all waters where the salinity is greater than 1 ppt more than 5 percent of the time during the calendar year is: a six-week rolling geometric mean of enterococci not to exceed 30 cfu/100 mL, calculated weekly, with a STV of 110 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.*

*U.S. EPA recommends using U.S. EPA Method 1600 or other equivalent method to measure culturable enterococci.*

**Table 5 - 0. REC-1 Bacteria Water Quality Objectives**

<b>Applicable Waters</b>	<b>Objective Elements</b>	<b>Estimated Illness Rate (NGI): 32 per 1,000 water contact recreators Magnitude (cfu/100 ml)</b>	
		<i>GM</i>	<i>STV</i>
<i>All waters where the salinity is equal to or less than 1 ppt 95 percent or more of the time</i>	<i>E. coli</i>	100	320
<i>All waters where the salinity is greater than 1 ppt more than 5 percent of the time</i>	<i>Enterococci</i>	30	110

*Table notes:*

1. *The waterbody GM shall not be greater than the applicable GM magnitude in any six-week interval, calculated weekly. The applicable STV shall not be exceeded by more than 10 percent of the samples collected in a CALENDAR MONTH, calculated in a static manner.*
2. *NGI = National Epidemiological and Environmental Assessment of Recreational Water gastrointestinal illness rate*
3. *GM = geometric mean*
4. *STV = statistical threshold value*
5. *cfu = colony forming units*
6. *ppt = parts per thousand*
7. *ml = milliliters*

The WQO language and WQO table is copied from the *Bacteria Provisions*. The WQOs already apply to Lahontan Region surface waters. This part of the amendment is an editorial (i.e., non substantive) change.

- 5.5.1 Removal of text related to ‘log mean,’ changes to ‘bacterial analysis’ text and addition of definitions for ‘geometric mean’ and ‘statistical threshold value’ from Chapter 5.1-12

The heading:

*‘References to “Means” (e.g., annual mean, log mean, mean of monthly means), “Medians” and “90th Percentile Values”’*

is changed to remove references to ‘log mean.’ ‘Log mean’ is replaced with ‘geomean,’ and the text ‘and Statistical Threshold Values’ is inserted at the end of the sentence.

The following additional text on page 5.1-12 column one, the following text is removed:

*A logarithmic or “log mean” (used in determining compliance with bacteria objectives) is calculated by converting each data point into its log, then calculating the mean of these values, then taking the anti-log of this log transformed average.*

The following text pertaining to geometric means is inserted in place of the deleted text:

*A geometric mean or “geomean” (used in determining compliance with bacteria objectives) is a type of mean that indicates the central tendency or typical value of a set of numbers by using the product of their values (as opposed to the arithmetic mean which uses their sum). The geometric mean is defined as the  $n$ th root of the product of  $n$  numbers. The formula is expressed as:  $GM = \sqrt[n]{(x_1)(x_2)(x_3) \dots (x_n)}$ , where  $x$  is the sample value and  $n$  is the number of samples taken.*



At the end of the “References to “Means” (e.g., annual mean, geomean, mean of monthly means), “Medians” and “90th Percentile Values,” and Statistical Threshold Values’ paragraph, the following definition for statistical threshold values is inserted:

*A statistical threshold value (STV) for the fecal indicator bacteria water quality objectives is a set value that approximates the 90th percentile of the water quality distribution of a bacterial population.*

On page 5.1-12, column 2, the paragraph ‘bacterial analyses’ is changed from:

*For bacterial analyses, sample dilutions should be performed so the range of values extends from 2 to 16,000. The detection method used for each analysis shall be reported with the results of the analysis. Detection methods used for coliforms (total and fecal) shall be those presented in Standard Methods for the Examination of Water and Wastewater (American Public Health Association et al. 1998), or any alternative method determined by the Regional Board to be appropriate.*

The following text is inserted to page 5-12, column 2:

*For bacterial analyses, the detection method used for each analysis shall be reported with the results of each analysis. Detection methods used for fecal indicator bacteria (FIB) shall be those presented in Standard Methods for the Examination of Water and Wastewater, 23<sup>rd</sup> edition (American Public Health Association et al. 2018), or any alternative method determined by the Regional Board to be appropriate.*

#### 5.6 Removing references to fecal coliform from Basin Plan Chapter 4.9

Basin Plan Chapter 4.9-19 column 2 contains two references to fecal coliform bacteria [emphasis added for report purposes]:

*Rangeland streams can show increased coliform bacterial levels with fecal coliform levels tending to increase as intensity of livestock use increases. Fecal coliform serve as indicators that pathogens could exist and flourish.*

References to coliform bacteria and fecal coliforms are removed, and terminology related to fecal indicator bacteria is inserted instead. These changes are made in keeping with the overarching changes to the Basin Plan made with this amendment. Further changes to the text of this section are made to improve readability:

*Rangeland streams may be impacted by fecal bacteria, demonstrated by increased fecal indicator bacteria levels as intensity of livestock use increases. Fecal indicator bacteria are indicators that pathogens may be present in a surface water.*

## 5.7 Summary of implementation provisions for REC-1 WQOs

The Statewide *Bacteria Provisions* contain implementation provisions, both for geometric means and STVs, and for a “reference system/antidegradation approach” that apply to Basin Plan amendments and Total Maximum Daily Loads (TMDLs). The implementation provisions are not specific requirements to implement the fecal bacteria water quality objectives. Rather, they are implementation options that Regional Water Boards may utilize to effectively implement the fecal bacteria water quality objectives and they may be applied at the discretion of a Regional Board. All details regarding implementation of WQOs for the REC-1 beneficial use can be found in the [Bacteria Provisions and Water Quality Standards Variance Policy \(Bacteria Provisions\)](#). This staff report and the BPA does not change the *Bacteria Provisions*, and the following summary is included for informational purposes only:

- **Geometric means:** The geometric mean values for *E. coli* and Enterococci shall preferably be a six-week rolling geometric mean calculated from weekly sampling. However, because of the large geography of the Lahontan Region and finite staff resources to sample surface waters on a weekly basis, a geometric mean may be calculated from three samples spread over a six-week period. This approach also supports the data collection by other agencies, private entities, and non-profits, which may also be challenged by the large geography of the Lahontan Region and limited resources. Should less than three samples be available in a six-week period, the STV shall be applied on a per-sample basis to determine compliance with the WQO.
- **Total Maximum Daily Load (TMDL) or other Basin Plan amendments:** The Regional Board may implement the geometric mean or statistical threshold values in fresh or saline waters by using a ‘reference system/antidegradation approach’ or ‘natural sources exclusion approach’.
- **A reference system implementation procedure:** This procedure is defined as an area and associated monitoring point that is not impacted by human activities that potentially affect fecal bacteria densities in the receiving waterbody. These approaches recognize that there are natural sources of fecal bacteria, which may cause or contribute to exceedances of the water quality objectives for FIB.
- **A natural sources exclusion implementation procedure:** After all anthropogenic sources of fecal bacteria have been controlled such that they do not cause or contribute to an exceedance of the single sample objectives and natural sources have been identified and quantified, a certain frequency of exceedance of the REC-1 WQOs shall be permitted based on natural sources. The ‘natural sources exclusion’ approach may be used if an appropriate reference system cannot be identified due to unique characteristics of the target waterbody. These approaches are consistent with the State Antidegradation Policy (State Board Resolution No. 68-16) and with federal antidegradation requirements (40 CFR 131.12).
- **High flow and seasonal suspensions of the REC-1 beneficial use:** The Water Board may consider a high flow or seasonal suspension of the REC-1

use depending on site specific conditions. Implementation of use suspensions are detailed in the *Bacteria Provisions*.

## 6. Basis for Amendment

### Removal of fecal coliform FIB

Fecal coliform FIB and associated WQOs are removed from the Basin Plan because:

1. Fecal coliform FIB is not a suitable indicator of recent fecal pollution in surface waters because one or more members of this FIB group may originate from nonfecal sources (U.S. EPA 1986, 2012). U.S. EPA strongly recommends that States cease to use fecal coliforms as FIB (*Ibid*, 1986, 2012). Because fecal coliforms may originate from nonfecal sources, the presence of fecal coliforms in a surface water sample is not a direct indicator that recent and potentially harmful fecal pollution may also be present in that surface water. In place of fecal coliforms, U.S. EPA recommends *E. coli* or Enterococci FIB for public health-related water quality monitoring (U.S. EPA, 1986, 2012).

The numeric threshold associated with the fecal coliform WQO is based on research performed in the 1940s and 1950s by the National Technical Advisory Committee (NTAC), a precursor organization to U.S. EPA (U.S. EPA 1986). More recent epidemiological studies performed by U.S. EPA (1986, 2012) have shown a stronger relationship between the presence of *E. coli* or Enterococci FIB in surface waters and adverse health effects in water contact recreators. U.S. EPA has developed numeric thresholds associated with these FIB and the potential risks to public health. *E. coli* and Enterococci numeric thresholds were published by U.S. EPA in the 1986 Ambient Water Quality Criteria and 2012 Recreational Water Quality Criteria. U.S. EPA recommends that State and Tribes use the *E. coli* or Enterococci criteria to determine if potentially harmful fecal pollution is present in surface waters (U.S. EPA, 2012). While changing a water quality objective from 20 fecal coliforms to 30 Enterococci or 100 *E. coli* may cause alarm to some, the differences between the numeric thresholds is not directly comparable and should not be the basis for determining a perceived level of water quality protection between the different objectives. Using the example of freshwater surface water assessment, applying the *E. coli* objective instead of the fecal coliform objective to determine attainment of the REC-1 beneficial use does not mean the Water Board is allowing more fecal contamination of that surface water, rather it means that the Water Board is using a nationally recognized water quality criteria which is backed by epidemiological studies linking the presence of *E. coli* FIB to health risks in water contact recreators. Continued application of the fecal coliform objective constitutes a continuation of outmoded science using a numeric threshold calculated via “an abundance of caution” rather than via a public health risk-assessment (U.S. EPA, 2012). Continued application of the fecal coliform WQO likely leads to misleading water quality assessments.

The project modernizes the Basin Plan to reflect the fact that fecal coliforms are now understood to originate from at least one or more nonfecal sources and their detection in a surface water cannot be attributed to fecal pollution with confidence. In addition, the 20 fecal coliform threshold was developed using “an abundance of caution” in the 1960’s by calculating the fifth percentile of a public health signal translated from total coliform organisms. Fecal coliforms are now understood to be problematic because they may not be fecal in origin. By comparison, *E. coli* and Enterococci offer a more reliable link to the presence of fecal pathogens. Multiple epidemiological surveys have found a health effect between the presence of *E. coli* and Enterococci in surface waters and illness in water contact recreators (U.S. EPA 1986, 2012). The numeric thresholds associated with each FIB are based off a U.S. EPA-led public health risk-assessment. U.S. EPA has determined an acceptable risk of level of 32 illnesses per one thousand exposures, or 0.032% risk of illness from incidental ingestion of surface waters attaining the *E. coli* or Enterococci WQOs.

2. Resolve 4 of State Water Board Resolution 2018-0038 encouraged the Lahontan Water Board to evaluate with input from relevant stakeholders the Region’s fecal coliform WQO. The Lahontan Board prioritized this evaluation during the 2018 Triennial Review, and the evaluation project was completed in May of 2021. The result of the evaluation project was a staff recommendation to remove the fecal coliform WQO for the reasons stated in this section of the Staff Report, and because of issues of clarity of regulation stemming from having two sets of WQOs for FIB applicable to Lahontan Region surface waters. Removing fecal coliform from the Basin Plan results in regulations which are easier to interpret for staff and stakeholders and which streamline the numeric regulations of the Lahontan Basin Plan with the rest of California using scientifically defensible criteria water quality criteria.

#### Changing ‘Bacteria, coliform’ heading to ‘Fecal Indicator Bacteria’

Changing the ‘Bacteria, coliform’ headings in Chapter 3 and Chapter 5 to ‘Fecal Indicator Bacteria’ is made so the Basin Plan reflects recent terminology pertaining to FIB water quality and water quality monitoring. ‘Bacteria, coliform’ is terminology related to fecal coliforms, while ‘Fecal Indicator Bacteria’ broadens the scope of potential water quality monitoring techniques used to determine if recent and potentially harmful fecal material is present in a surface water.

#### Changes to narrative text associated with FIB WQOs

The narrative WQOs found in Chapters 3 and 5 under the ‘Fecal Indicator Bacteria’ (previously ‘Bacteria, coliform’) headings are changed to modernize the terminology of the objectives, expand their applicability to cover all types of fecal wastes, and to enable the use of a variety of fecal waste surface water monitoring methods. The BPA removes the requirement that fecal waste be defined by coliform organisms, broadening the term to ‘fecal indicator bacteria’.

The text 'deleterious to beneficial uses' is added to clarify that the narrative water quality objective applicable to the protection of beneficial uses in all surface waters, including those where the REC-1 beneficial use does not apply.

Retaining narrative WQOs allows the Water Board to continue to apply narrative objectives to assess and protect the quality of surface waters. Revising the language broadens the available monitoring and analysis methods that could be used to ensure protection of beneficial uses and helps the Water Board to derive limitations, targets, or thresholds to protect water quality in a variety of settings.

### Insertion of language pertaining REC-1 WQOs

*E. coli* and Enterococci FIB WQOs are inserted into the Basin Plan in reference to the *Bacteria Provisions* that apply to all waters in California where the REC-1 use is designated, including in the Lahontan Region. The statewide WQOs are already effective and the language referencing those objectives are not creating a substantive change. Rather, language pertaining to those FIB WQOs is added to the Lahontan Basin Plan to clarify applicable regulations and inform the public of the established WQOs.

### Editorial changes to other text related to fecal bacteria

Changes to text related to the implementation of the fecal bacteria objectives are made to Chapter 3-16 and Chapter 5.1-12. These changes include removing language pertaining to the definition of 'log means,' insertion of definitions for geometric means and statistical threshold values, and minor changes to the 'bacterial analyses' paragraph. These changes remove terms no longer needed because the fecal coliform indicator and associated WQOs are removed from the Basin Plan and add definitions that could be used in determining compliance with the narrative WQOs. The changes also align the definition of geometric means with that promulgated by State Board in their *Bacteria Provisions*.

Basin Plan Chapter 4.9-19 column 2 is changed to remove references to fecal coliforms, in favor of the term 'fecal indicator bacteria.' This and other minor changes to the text are made to align with the changes to Chapters 3 and 5 with this amendment.

## **7. California Water Code 13241**

California Water Code section 13241 requires assessment of specific factors when adopting water quality objectives. These factors consist of:

- Past, present, and probable future beneficial uses of water.
- Environmental characteristics and water quality of the hydrographic unit under consideration.
- Water quality conditions that could be reasonably attained through coordinated control of all factors affecting water quality.
- Economic considerations.
- The need for developing new housing.
- The need to develop and use recycled water.

This Basin Plan Amendment alters WQOs applicable to Lahontan Region waters, thus California Water Code 13241 applies. Assessment of each factor is discussed below. The Basin Plan Amendment does not alter the already established and effective statewide bacteria water quality objectives adopted by State Board. As part of the establishment of the State Water Board's bacteria objective, State Water Board conducted a 13241 analysis. The Lahontan Water Board is not required to conduct or repeat that analysis.

### 7.1 Past, present, and probable future beneficial uses of water

Basin Plan Chapter 2 defines beneficial uses for all waters of the Lahontan Region. The complete list of Lahontan Region beneficial uses can be viewed at the [Chapter 2 – Present and Potential Beneficial Uses webpage](https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/docs/ch2_bu.pdf) ([https://www.waterboards.ca.gov/lahontan/water\\_issues/programs/basin\\_plan/docs/ch2\\_bu.pdf](https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/docs/ch2_bu.pdf)). These beneficial uses adequately represent past, present and probable future uses.

Removing the fecal coliform indicator and associated WQOs from the Basin Plan will not lessen the protection of beneficial uses. The statewide REC-1 WQOs of the *Bacteria Provisions* are based on U.S. EPA 2012 Recreational Water Quality Criteria (RWQC), which were developed upon a public health risk-assessment and are set at a level to minimize risk of human illness associated with REC-1 uses. The U.S. EPA-led risk assessment found a correlation between the presence of *E. coli* and Enterococci in surface waters and incidence of illness in water contact recreators. U.S. EPA developed two risk thresholds for illness rates associated with REC-1 uses: 32 or 36 illnesses per one thousand recreators. The State Board *Bacteria Provisions*, which are based upon the RWQC, determined the more stringent illness rate of 32/1000 recreators to be appropriate for California surface waters. This illness rate equates to geometric means of 100 *E. coli* per 100 milliliters of sample water or 30 Enterococci per 100 milliliters of sample water. The *Bacteria Provisions* are already effective for Lahontan Region surface waters, and the Water Board's BPA does not change or otherwise alter the *Bacteria Provisions*.

Fecal coliforms and associated WQOs are removed from the Basin Plan because 1) fecal coliforms may originate from nonfecal sources, compromising their accuracy as an indicator of fecal pollution; and 2) the numeric thresholds of the WQO are not explicitly linked to a robust risk assessment and may not be indicative of adverse water quality impacts. The fecal coliform WQO is not associated with a specific beneficial use and the removal of this objective will not impact the Water Boards' ability to protect beneficial uses.

The Basin Plan narrative WQO for FIB applies to all surface waters in the region regardless of beneficial use, including where REC-1 uses do not apply. Surface waters where the REC-1 use does not apply are shown in Table 7.1. The Water Board may use the narrative WQO to address fecal pollution in surface waters depending on the most sensitive beneficial use and taking into account the latest science on indicators and thresholds.

**Table 7.1: Surface waters not designated REC-1 beneficial uses**

<u>Hydrologic Unit Number</u>	<u>Waterbody name</u>	<u>Waterbody classification</u>	<u>Receiving water</u>
626.50	Amargosa creek below LA County Sanitation District Discharge	Ephemeral Stream	Piute ponds and wetlands
626.50	Piute Ponds	Ponds	Rosamond Dry Lake
626.50	Piute Ponds Wetlands	Wetlands	Rosamond Dry Lake
626.50	Rosamond Dry Lake	Playa Lake	Terminal Lake
628.42	Opal Mtn Springs (Harper Valley)	Springs	None listed

7.2 Environmental characteristics and water quality of the hydrographic unit under consideration

The hydrographic unit for this BPA is all surface waters contained in the Lahontan Region. The general environmental characteristics and existing water quality of the Lahontan Region are described in [Section 4](#).

7.3 Water quality conditions that could be reasonably attained through coordinated control of all factors affecting water quality

A summary of recent Lahontan Region FIB water quality data is provided in the [2018 Integrated Report](#) Staff Report Section 2.1. The Integrated Report is the Water Board’s periodic assessment program satisfying CWA Sections 303 and 305. The report identifies surface waters which do not attain one or more beneficial uses and provides the recommendation to U.S. EPA to place such waters on the 303(d) List.

Headwater streams flowing eastward from the Sierra Nevada Crest typically have low concentrations of FIB in water quality samples, although occasionally FIB concentrations increase downgradient in the lower elevation portions of the region. Waterbodies in lower elevation areas are typically subject to greater impacts from anthropogenic activities and from natural sources, and these waters also receive proportionally more recreational activity when compared to headwater sites.

At headwater sites with little or no regular anthropogenic disturbance and few impacts from natural sources, the available FIB data indicates that Lahontan waters are of exceptional quality, by far attaining the statewide E. coli standard for the REC-1 beneficial use and also typically attaining the fecal coliform WQO. Despite the regions’ excellent FIB water quality, the very restrictive fecal coliform WQO results in multiple 303(d) listings based on fecal coliform FIB. Such listings are problematic because 1) fecal coliforms may originate from nonfecal sources, meaning the presence of these fecal bacteria cannot be confidently attributed to the presence of fecal pollution, and 2)

the fecal coliform WQO threshold is set at a level which has no bearing on impacts to beneficial uses.

Based on most recent water quality data, removing fecal coliform FIB and associated WQOs from the Basin Plan will result in the removal of thirty-five (35) surface waters from the 303(d) List because such surface waters were placed on the list based on exceedances of the fecal coliform WQO but met the REC-1 *E. coli* standard. Passage of this BPA will thus modernize the Lahontan Regions' 303(d) List to reflect nationally accepted water quality criteria for fecal pollution.

Nine (9) Lahontan Region surface waters are presently 303(d) Listed because the REC-1 use is not supported, as demonstrated by concentrations of *E. coli* FIB. These surface waters are shown in Table 7.2. Where fecal coliform data existed, these surface waters also exceeded that WQO. For those waters on the 303(d) list for indicator bacteria, the Water Board is required to determine the amount that FIB must be reduced to meet the applicable standards and eliminate beneficial use impairment. The Water Board has several tools at its disposal to achieve water quality improvements, including but not limited to TMDL programs of implementation, Waste Discharge Requirements (WDRs), conditional Waivers of WDRs, and collaborative water quality improvement plans (WQIPs).

While developing these regulatory tools, the Water Board must consider a variety of factors to achieve a successful outcome. One of the first steps is to identify the sources contributing to the problem and the timing of those sources. For example, some surface waters are mainly threatened by high FIB concentrations during agricultural irrigation season. Other waterbodies may be threatened by FIB because of urban runoff or leaking septic systems. All controllable sources of FIB to surface waters must be identified and addressed in a coordinated effort so that water quality supporting beneficial uses may be reasonably achieved. After coordinated, sustained efforts have been made to reduce anthropogenic sources of fecal bacteria pollution in a specific surface water, should fecal bacteria continue to impact water quality, a natural sources exclusion approach may be pursued. Such an approach is described in the *Bacteria Provisions* and associated Staff Report and Substitute Environmental Document.



**Table 7.2 303(d) listed waterbodies for the REC-1 use**

Waterbody Name	County	Integrated Report Decision ID
Bishop Creek Forks	Inyo	102037
East Walker River, above Bridgeport Reservoir	Mono	69501
Griff Creek	Placer	103204
Horton Creek	Inyo	103691
Hot Creek (Walker)	Mono	103703
Markleeville Creek	Alpine	102648
Owens River (Long HA)	Mono	102411
Pine Creek	Inyo	102348
Swauger Creek	Mono	76545

#### 7.4 Economic considerations

Under the requirements of Water Code sections 13170 and 13241, subdivision (d), and the California Code of Regulations, title 23, section 3777, subdivisions (b)(4) and (c), the Water Board must consider economics when establishing water quality objectives. Consideration of economics is not a cost-benefit analysis and, particularly with respect to the analysis required by the certified regulatory program, the Water Board is not required to engage in speculation or conjecture and the consideration of economics should include consideration of potential costs of the reasonably foreseeable measures to comply with the amendment. As further discussed in [Section 11](#) of this Staff Report, no new or additional bacterial controls would need to be implemented to comply with this project, therefore compliance costs associated with technology changes or substantial operational changes or implementation of other bacteria controls would be zero. Based on review of the Lahontan Region 2018 Integrated Report (details provided in [Section 7.3](#)), nine surface waters (shown in Table 7.2) do not attain *E. coli* FIB WQOs for the protection of REC-1 uses. Further analyses of economic considerations associated with REC-1 WQOs are examined in the *Bacteria Provisions Staff Report*, which should be consulted for more information. This section of the Staff Report includes a discussion of economics associated with the BPA.

#### Economic considerations for wastewater permitting

Monitoring costs and treatment process costs for municipal wastewater discharges to fresh water are not likely to change due to the BPA. Where freshwater dischargers are regulated by water quality-based permit effluent limitations that are derived from the more stringent Title 22 recycled water criteria, dischargers will continue to measure effluent using indicators identified with the Title 22 recycled water criteria. Typical wastewater treatment practices and performances are more than adequate to achieve both the fecal coliform and REC-1 WQOs, which are designed for application to ambient surface waters.

An assessment of compliance methods and associated costs to comply with the *Bacteria Provisions* WQOs was performed by Abt Associates during development of the staff report for that project. Plants with limitations which arose from objectives based on U.S. EPA's 1976 or 1986 criteria, or more stringent Title 22 human health objectives, were assumed to possess baseline limitations at least as stringent as the objectives in the *Bacteria Provisions*. Compliance costs were assumed to be zero for these facilities since no technological changes or substantial operational changes would be necessary (*Staff Report of the Bacteria Provisions Staff Report*, page 144). There are no anticipated additional treatment requirements resulting from this BPA as the narrative water quality objective and the *Bacteria Provision* WQOs would continue to apply, and therefore compliance costs are zero.

No significant changes to monitoring costs are forecast for wastewater treatment facilities. Should there be facilities that are not already collecting *E. coli* or Enterococci FIB, these facilities may be required to do so in the future. Costs associated with these assays run at approximately \$50 (*Bacteria Provisions Staff Report*, 2018), which are similar to those costs incurred to sample fecal coliforms. No significant changes to monitoring costs are forecast for wastewater treatment facilities. For dischargers who currently monitor for both *E. coli* and fecal coliform, the BPA could result in cost savings associated with monitoring.

### Economic considerations for ambient water quality monitoring

There are no foreseeable additional economic impacts to ambient monitoring associated with this BPA. The Water Boards' Surface Water Ambient Monitoring Program (SWAMP) monitors FIB on an ongoing basis to ensure that water quality is suitable for water contact recreation.

### Economic considerations for stormwater

Stormwater permits currently require the discharger to develop and implement best management practices to the maximum extent practicable (for municipal dischargers and discharges from the California Department of Transportation's facilities) using the best conventional pollutant control technology (for industrial and construction discharges). These requirements are not expected to change due to the BPA. Best management practices will continue to be required, and possible incremental costs will be relatively low. Therefore, compliance costs of this BPA are projected to be zero.

If there are dischargers not already collecting *E. coli* or Enterococci FIB, these dischargers may be required to do so in the future. Costs associated with these assays run at approximately \$50 (*Bacteria Provisions Staff Report*, 2018), which are similar to those costs incurred to sample fecal coliforms. No significant changes to monitoring costs are forecast for stormwater dischargers. For dischargers who currently monitor for both *E. coli* and fecal coliform, the BPA could result in cost savings associated with monitoring.

### Economic considerations for nonpoint source discharges

FIB sources in waterbodies can be nonpoint source in origin, such as from agricultural

or urban runoff, including livestock grazing, residential-related sources from pet ownership, and dispersed camping. Control of FIB from nonpoint sources is not an element of this BPA. It is expected that nonpoint source discharge requirements under the BPA will be broadly similar to current requirements. Nonpoint source pollution control efforts typically rely upon discharger implementation of management practices to control pollution, including bacteria pollution.

Examples of best management practices to reduce FIB from agricultural nonpoint sources include installation of buffers and filter strips to protect surface waters from direct agricultural runoff, implementing irrigation water tailwater management strategies to reduce FIB loading to surface waters, implementing management controls for manure and manure storage areas, restricting direct livestock access to surface waters, and provision of off channel stockwater. These management practices will continue regardless of this BPA, and therefore there are no additional costs from new or additional bacteria controls associated with the BPA.

#### 7.5 The need for developing new housing

The BPA does not restrict the development of housing in the Lahontan Region. Removing the fecal coliform objective and revising the narrative objective does not affect housing or any economic costs related to housing development. The amendment does not constrain the ability of wastewater treatment facilities to respond to population growth. Wastewater treatment facilities are already required to comply with effluent limitations more stringent than the numeric thresholds of the fecal coliform WQO and the *Bacteria Provisions*.

#### 7.6 The need to develop and use recycled water

The BPA has no foreseeable impact on wastewater available for recycling or reclamation in the region.

## 8 Antidegradation

The State Water Board and U.S. EPA have adopted antidegradation policies intended to protect existing high-quality waters. Both the state and federal antidegradation policies require the high quality of these waters to be maintained unless otherwise provided by the policies. In 1968, the State Water Board adopted California's antidegradation policy by Resolution 68-16, "*Statement of Policy with Respect to Maintaining High Quality of Waters in California*" which applies to surface waters and groundwater whose quality meets or exceeds water quality objectives and establishes the intent to maintain high quality waters of the state to the maximum extent possible. Whenever existing water quality is better than the quality established in applicable policies or plans, Resolution 68-16 provides that the high water quality must be maintained unless it can be demonstrated that any change in water quality will (1) be consistent with the maximum benefit to the people of the state, (2) not unreasonably affect present and anticipated beneficial uses of such water, and (3) not result in water quality less than that prescribed in applicable water quality control policies or plans.

Further, any activity that results in a discharge to high quality waters must use the best practicable treatment or control necessary to avoid a pollution or nuisance and to maintain the highest water quality consistent with the maximum benefit to the people of the state.

The federal antidegradation policy, established in 1975, applies to surface water, regardless of the quality of the water. (40 C.F.R. § 131.12.) Under the federal policy, “existing instream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected.” (40 C.F.R. § 131.12(a)(1).) In addition, where the quality of waters exceeds levels necessary to support the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water, that quality of water must be maintained and protected unless the state finds that (1) allowing lower quality is necessary to accommodate important economic or social development in the area in which the waters are located; (2) water quality is adequate to protect existing beneficial uses fully; and (3) the highest statutory and regulatory requirements for all new and existing point sources and all cost-effective and reasonable best management practices for nonpoint source control are achieved. (40 C.F.R. § 131.12(a)(2).) For high quality waters which constitute an Outstanding National Resource Water (ONRW), that water quality shall be maintained and protected (40 C.F.R. § 131.12(a)(3)). The State Water Board has interpreted Resolution 68-16 to incorporate the federal policy where the federal policy applies under federal law.

### 8.1 Antidegradation and the Basin Plan Amendment

The Basin Plan Amendment is not expected to lead to a reduction in water quality. There is no evidence to suggest that removal of the fecal coliform WQO will cause degradation of Lahontan Region surface waters. Rather, the amendment ensures that applicable regulations protects beneficial uses fully.

The Basin Plan Amendments do not themselves authorize the degradation of any high-quality waters. Any degradation that would occur as an indirect result of the Basin Plan Amendment would occur when the State Board or Regional Board prescribes or modifies WDRs (including National Pollution Discharge Elimination Systems (NPDES) Permits), issues conditional waivers, or issues water quality certifications that authorize waste discharges to surface waters. Any changes to the allowable discharge that are not related to implementation of the Basin Plan Amendment (e.g., increase in authorized discharge amount) are beyond the scope of this project, and are not analyzed in this Staff Report. The Water Board is already obligated to determine on a permit-by-permit basis whether degradation would occur as a result of the permit, whether an antidegradation analysis is required, and if the permit is consistent with state and federal law (if applicable), including antidegradation policies, at the time of issuing, reissuing, renewing, or reopening a permit. The Water Board does not anticipate any degradation of water quality as an indirect result of the requirements being prescribed in WDRs or other orders.

Removing the fecal coliform objectives from Chapter 3 and Chapter 5 of the Basin Plan will improve clarity, reflect the latest scientific understanding on bacteria indicators, and

remove an objective that is not directly connected to a beneficial use. Fecal coliforms may originate from one or more nonfecal sources and there is low confidence that their detection in a surface water is a good indicator of the presence of recent and harmful fecal pollution. Epidemiology has shown *E. coli* and Enterococci FIB to be better indicators that a surface water may manifest a public health risk because of fecal pollution contamination (U.S. EPA, 1986, 2012). It follows, then, that fecal coliform FIB is less effective at protecting public health when compared to *E. coli* or Enterococci FIB. It also follows that detecting fecal coliforms in a surface water may lead to false positive assessments of water quality, meaning that a surface water may be determined to be impaired by fecal pollution when in fact the fecal coliforms responsible for the determination originate from nonfecal sources. By removing the fecal coliform WQO from the Basin Plan and regulating fecal pollution of surface waters through a combination of narrative water quality objectives and the statewide *Bacteria Provisions* WQOs, the Lahontan Water Board is applying nationally accepted FIB thresholds and improving the accuracy of FIB water quality assessments in Lahontan Region surface waters.

Furthermore, a narrative WQO is applicable to all Lahontan Region surface waters, including those waters where the REC-1 beneficial use does not apply. Revisions to the narrative WQO included in this amendment will provide water quality protections greater than those based on the existing water quality objectives. The BPA changes the narrative WQO pertaining to FIB water quality from '*Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes*' to '*Waters shall not contain concentrations of Fecal Indicator Bacteria (FIB) deleterious to beneficial uses.*' As described in [Section 6](#) of this Staff Report, 'coliform organisms' can originate from fecal and non-fecal sources. Research related to fecal waste and detection in surface waters is continually expanding and now includes genetic methods capable of determining and quantifying sources of fecal waste. Source identification and quantification is an important step in understanding the risk level associated with fecal waste in surface waters. The revised narrative WQO broadens the objective to address concentrations of fecal material from a wide variety of sources. The Water Board will be able to take into account scientific advancements in detecting pathogens from fecal sources when applying the narrative WQO. Revising the language broadens the methods that could be used to ensure protection of beneficial uses, thereby improving the use of the narrative water quality objective to derive limitations, targets, thresholds, or other requirements to protect water quality. The narrative WQO constitutes a protective backstop for all beneficial uses of water in the Lahontan Region.

In addition, the BPA is not revising or amending existing protections of the REC-1 use. State Board's bacteria water quality objectives for the protection of REC-1 apply to surface waters in the Lahontan Region. The Bacteria Provisions established updated water quality objectives based on the U.S. EPA's 2012 Recreational Water Quality Criteria which protect public health related to water-contact activities and reflect the latest scientific knowledge and external peer review. The BPA does not revise State Board's *Bacteria Provisions*.

The BPA does not remove or revise existing regionwide prohibitions in the Lahontan Region. Regionwide prohibitions include but are not limited to: (1) The discharge of waste that causes violation of any narrative or numeric water quality objective contained in this Plan is prohibited; and (2) The discharge of untreated sewage, garbage, or other solid wastes into surface waters of the Region is prohibited. These prohibitions protect surface waters in the Region by limiting the discharge of fecal waste.

Therefore, in totality, no adverse changes in water quality are expected as a result of the BPA. The amendment will maintain and protect surface waters because the narrative WQO is revised to broaden the methods used to determine whether a deleterious effect to beneficial uses is occurring, and the *Bacteria Provisions* reflect the latest science and risk levels. Existing water quality protections provided by Basin Plan prohibitions are not affected by this BPA and therefore no water quality changes are expected as a result. The critical issue in determining whether a proposed action will lower surface water quality is not the level of treatment provided or whether a water quality objective is revised, but whether a lowering of the receiving waters will be affected. As such, no degradation, either short- or long-term, to Lahontan Region waters, including the Regions' ONRWS, can foreseeably be attributed to the basin plan amendment. For further discussion on ONRWS, see section 8.2.

### 8.2 Outstanding National Resource Waters

The Lahontan Region contains both of California's Outstanding National Resource Waters (ONRWS), Lake Tahoe and Mono Lake. Lake Tahoe sits in both Placer and El Dorado counties and straddles the California-Nevada state line in the northern Sierra Nevada range. Mono Lake sits in the heart of Mono County in the Mono Basin at the foot of Tioga Pass and Conway Summit in Eastern California.

Lake Tahoe is renowned for its extraordinary water clarity, purity, and deep blue color. The Water Board recognizes Lake Tahoe as an ONRW both for its recreational and ecological value. Mono Lake is a hypersaline waterbody which provides significant ecological value and supports species such as brine shrimp, alkali flies, California Gulls and Eared Grebes. The Water Board recognizes Mono Lake as an ONRW because of its ecological value as a one-of-a-kind ecosystem.

ONRWS are afforded the highest level of protection through the antidegradation policy by requiring that the water quality be maintained and protected. States are given flexibility to permit limited activities that result in temporary and short-term changes in water quality. U.S EPA summarizes § 131.12 (a)(3) of the Antidegradation Policy in the Water Quality Standards Handbook: Second Edition, by stating, "States may allow some limited activities which result in temporary and short-term changes in water quality, but such changes in water quality should not impact existing uses or alter the essential character or special use that makes the water an ONRW."

As described in Section 8.1, this amendment to Lahontan Region fecal bacteria WQOs will not change water quality in ONRWS. Instead, the amendment modernizes the Lahontan Region Basin Plan to be consistent with U.S. EPA recommended recreational

water quality criteria and State of California regulations for protection of the REC-1 beneficial use in both fresh-water and saline surface waters. Furthermore, the BPA does not remove existing protections in the ONRWs.

Waste discharge prohibitions applicable within the Lake Tahoe Hydrologic Unit are discussed in Chapter 5 of the Basin Plan. Regionwide prohibitions also apply in the Lake Tahoe Hydrologic Unit. The Water Board Basin Plan continues to prohibit the discharge of any waste or deleterious material to surface waters, stream environment zones, and to land below the high-water rim of Lake Tahoe, as detailed in Basin Plan Chapter 5.2. In addition, Water Code sections 13950 through 13952.1 include special water quality provisions for the Lake Tahoe Basin related to sewage disposal that function as waste discharge prohibitions.

Similarly, Basin Plan Chapter 4.1 includes specific prohibitions that apply to the watersheds surrounding Mono Lake. In particular, “[t]he discharge of waste to surface water, including sewage or sewage effluent, is prohibited in the following locations: Mill Creek and Lee Vining Creek watersheds (Figure 4.1-9).” Mill Creek and Lee Vining Creek are tributaries to Mono Lake, and existing prohibitions protect Mono Lake.

Overall water quality in Lake Tahoe and Mono Lake will be maintained regardless of changes to FIB WQOs applicable to these waterbodies through existing prohibitions and other regulatory mechanisms, and as further described in section 8.1 of this Staff Report. The Water Board administers regulatory oversight including but not limited to a combination of NPDES permits, waste discharge prohibitions and 401 permitting processes in the Lake Tahoe and Mono Basins. Removing the fecal coliform WQO from the Basin Plan in favor of the statewide *Bacteria Provisions* will improve the Water Board’s ability to protect the recreational water user because *E. coli* and Enterococci FIB are more closely linked to the presence of potentially harmful fecal pollution in surface waters compared to fecal coliforms.

## 9 Human Right to Water

California Assembly Bill 685 (AB 685) declares that “every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes” (Wat. Cod, § 106.3, subd. (a)) and promotes the adoption of policies, regulations, and grant criteria pertinent to those uses of water (ibid., § 106.3, subd. (c)). State Water Board Resolution No. 2016-0010 adopts the human right to water as a core value, adopts the realization of the human right to water as a top priority for the Water Boards, and directs staff, when submitting a recommendation to the board pertinent to the human right to water, to describe how the right was considered. The WQOs of this Basin Plan amendment do not directly pertain to drinking water meaning any effects on the affordability or accessibility of safe clean drinking water would be indirect.

## 10 Tribal Consultation

Executive Order B-10-11 provides that it is the policy of the administration of the Governor of the State of California that every state agency encourage consultation and communication with California Indian Tribes and permit tribal governments to provide meaningful input in the development of regulations, rules, and policies that may affect tribes. In addition, California State Assembly Bill (AB) 52 (Gatto 2014) established a new category of resources in CEQA called Tribal Cultural Resources and a new consultation process with California Native American tribes (“AB 52 tribal consultation”). Consultation with a California Native American tribe that has requested such consultation may assist a lead agency in determining whether the project may adversely affect tribal cultural resources, and if so, how such effects may be avoided or mitigated. The Public Resources Code requires formal notice to California tribes of an opportunity to consult with the lead agency prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report if the tribe is traditionally and culturally affiliated with the geographic area of the proposed project. The requirements to consider tribal cultural resources and to consult with California tribes apply to CEQA projects for which the lead agency issues a notice of preparation or a notice of intent to adopt a negative declaration or mitigated negative declaration, or Environmental Impact Report (EIR) on or after July 1, 2015. The Water Board’s considers the AB 52 tribal consultation requirements in the Public Resources Code as also applying to an SED.

On August 4<sup>th</sup>, 2021 the Water Board notified Native American Tribes that requested to receive AB 52 notices of the opportunity to consult with the Water Board on Basin Plan amendment for FIB WQOs. The Board also extended this notification to Native American Tribes with [ancestral](#) lands in the Lahontan Region who had not requested review under AB52.

The Water Board received three responses from Tribes: the Shingle Springs Band of Miwok Indians, the San Manuel Band of Mission Indians, and the United Auburn Indian Community. None of the responses requested a consultation with project staff regarding the project, instead indicating the preference to not consult. The Water Board has received no requests for consultation on this amendment project from Tribes.

## 11 Reasonably Foreseeable Methods of Compliance

The SED for the proposed project is required to include an analysis of the reasonably foreseeable methods of compliance with the project. (Cal. Code Regs., tit. 23, § 3777;13 Publ. Res. Code § 21159). The Basin Plan Amendment would update the existing narrative objective and remove the fecal coliform objective. As described in Section 8 of this Staff Report, these revisions would provide a similar degree of protection for beneficial uses, and they are not significantly more stringent than the existing objectives. The amendment will maintain and protect surface waters because the narrative WQO is revised to broaden the methods used to determine whether a deleterious effect to beneficial uses is occurring, and the *Bacteria Provisions* reflect the latest science and risk levels. Existing water quality protections provided by Basin Plan prohibitions other implementation section of the Basin plan are not affected by this BPA.



As a result, the BPA will not lead to additional implementation efforts or the addition of new methods of compliance.

Bacteria controls are already being implemented in the Lahontan Region, and would continue to be implemented irrespective of the Basin Plan Amendment. For example, traditional point sources such as wastewater treatment plants have NPDES permits that regulate their discharges, with effluent limits for bacteria. These sources mostly have more stringent freshwater bacteria effluent limits derived from the Title 22 recycled water criteria. The BPA does not alter that criteria. In addition, dischargers would continue to implement bacteria controls to meet narrative water quality objective and the *Bacteria Provision WQOs* would continue to apply.

Storm water runoff is regulated through the Storm Water Program. Several strategies exist to reduce fecal bacteria loads in California's surface waters from stormwater. Combinations of measures are often necessary to reduce bacteria to levels that meet water quality objectives. These measures are categorized as structural BMPs and non-structural BMPs. Stormwater permits currently require the discharger to develop and implement best management practices to the maximum extent practicable (for municipal dischargers and discharges from the California Department of Transportation's facilities) or using the best conventional pollutant control technology (for industrial and construction discharges). These requirements are not expected to change due to the BPA and best management practices will continue to be required.

Bacteria controls for non-point source discharges would also remain unchanged. Agricultural producers implement grazing management plans with the goal of improving or maintaining water quality by minimizing direct loading of animal waste into surface waters. Nonpoint source pollution control efforts typically rely upon discharger implementation of management practices to control pollution, including fecal bacteria pollution. Examples best management practices (BMPs) to reduce FIB from agricultural nonpoint sources include installation of buffers and filter strips to protect surface waters from direct agricultural runoff, implementing irrigation water tailwater management strategies to reduce FIB loading to surface waters, implementing management controls for manure and manure storage areas, restricting direct livestock access to surface waters, and provision of off channel stockwater. These management practices will continue regardless of this BPA, and therefore there are no new or additional bacteria controls associated with the BPA.

As no new or additional bacterial controls would need to be implemented to comply with this project, there are no reasonably foreseeable methods of compliance with the project. Examples of existing methods of compliance are described in the *Bacteria Provisions Staff Report*, which is incorporated by reference into this SED.

## **12 Environmental Effects**

Per the requirements of the State Water Board's certified regulatory program (Cal. Code Regs., tit. 23, section 3777, subds. (b)(2) - (b)(4).), the environmental analysis includes:

- An identification of any significant or potentially significant adverse environmental impacts of the project;
- An analysis of reasonable alternatives to the project and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts; and
- An environmental analysis of the reasonably foreseeable methods of compliance, including:
  - An identification of the reasonably foreseeable methods of compliance with the project;
  - An analysis of any reasonably foreseeable significant adverse environmental impacts associated with those methods of compliance;
  - An analysis of reasonably foreseeable alternative methods of compliance that would have less significant adverse environmental impacts; and
  - An analysis of reasonably foreseeable mitigation measures that would minimize any unavoidable significant adverse environmental impacts of the reasonably foreseeable methods of compliance.

This section of the Staff Report identifies and evaluates the potential environmental impacts that may arise from the project and the reasonably foreseeable methods of compliance. (Cal. Code Regs., tit. 23, § 3777(b).

The *Fecal Bacteria Water Quality Objectives Basin Plan Amendment* removes the existing fecal coliform bacteria numeric WQO which applies regionwide, updates the narrative bacteria WQO, and inserts language from the *Bacteria Provisions* related to REC-1 WQOs that already apply to surface waters in the Lahontan Region. The BPA does not specify implementation requirements. Therefore, there will be no change in the physical environment related to the adoption of the project itself. There is no possibility that the BPA may produce any significant environmental effects.

As described in Section 8 of this Staff Report, the BPA would provide a similar degree of protection for beneficial uses. The amendment will maintain and protect surface waters because the narrative WQO is revised to broaden the methods used to determine whether a deleterious effect to beneficial uses is occurring, and the existing *Bacteria Provisions* reflect the latest science and risk levels. Existing water quality protections provided by Basin Plan prohibitions and other implementation section of the Basin plan are not affected by this BPA.

The BPA modernizes the Basin Plan to reflect the fact that fecal coliforms are now understood to originate from at least one or more nonfecal sources and their detection in a surface water cannot be attributed to fecal pollution with confidence. In addition, the 20 fecal coliform threshold was developed using “an abundance of caution” in the 1960’s. By comparison, *E. coli* and Enterococci FIB offer a more reliable link to the presence of pathogenic organisms originating from feces. Multiple epidemiological surveys have found a health effect between the presence of *E. coli* and Enterococci in surface waters and illness in recreators (U.S. EPA 1986, 2012). The numeric thresholds associated with each FIB are based off a public health risk assessment. U.S. EPA has

determined an acceptable risk of level of 32 illnesses per one thousand exposures, or 0.032% risk of illness from incidental ingestion of surface waters attaining the *E. coli* or Enterococci WQOs. Application of these WQOs will lead to more accurate determinations regarding risks to human health and water quality impairment.

## 13 Alternatives

California Code of Regulation Title 23, Section 3777 states that any standard, rule, regulation, or plan proposed for board approval or adoption must be accompanied by a discussion of reasonable alternatives to the project and consideration of reasonably foreseeable methods of compliance that could feasibly avoid or substantially reduce any potentially significant adverse environmental impacts. As discussed in section 9 and section 10 of this Staff Report, no reasonably foreseeable methods of compliance from the project are expected, nor is the project expected to create an impact to the environment. Section 9 and Section 10 discuss the impacts associated with the continued implementation of methods of compliance. As no potentially significant effects were identified from the reasonably foreseeable methods of compliance or the project, the alternatives in this section are not those capable of avoiding or substantially lessening the significant environmental impacts of the project. This discussion is included for purposes of informing decision makers and the public of any possible project alternatives. The Preferred Alternative (i.e., this Basin Plan Amendment) and a No Action Alternative are discussed in this section. In preparation for this BPA, during 2020 and 2021 project staff evaluated fecal indicator bacteria WQOs applicable to the Lahontan Region. Details of this evaluation project were presented to the Water Board on January 13<sup>th</sup>, 2021 and May 13<sup>th</sup>, 2021. The evaluation included exploration of a suite of potential options for a BPA. Details on these options can be found in the [January 2021](#) and [May 2021](#) Board Packets.

### 13.1 Alternative 1: No Project

Under this alternative, the Basin Plan would not be amended to remove the fecal coliform objective, add language pertaining to the *Bacteria Provisions*, change the narrative water quality objective associated with fecal bacteria pollution for the protection of non-REC-1 waters, and remove language related to log means and bacterial analysis on from page 3-16.

The fecal coliform based numeric water quality objective would remain applicable to Lahontan Region surface waters, meaning the Basin Plan would remain inconsistent with U.S. EPA recommended FIB criteria. Multiple FIB WQOs would remain in place for surface waters, perpetuating clarity and consistency issues for water quality assessments, permit writing, and clear and obvious regulations for stakeholders.

### 13.2 Alternative 2: Pursue Basin Plan Amendment as proposed

Under this alternative, the Basin Plan would be amended as proposed in this Staff Report. As further described in this Staff Report, these amendments are made to modernize the Basin Plan by removing outmoded FIB WQOs and inserting existing

state and federal recommended FIB criteria. This action will streamline the Basin Plan with the *Bacteria Provisions* and thus incorporate fecal indicator bacteria WQOs which are already applicable to the Lahontan Region. Passage of these amendments will help support clear, concise FIB regulations for Lahontan Region surface waters in a manner that is consistent with state and federal partners.

## **14 Public Outreach**

### December 2019 through May 2021

In anticipation of public interest in this project, staff worked with the Office of Public Participation (OPP) to engage interested parties throughout the region. Public engagement began with a listserv-distributed survey in January 2020. The survey received almost 80 responses which helped staff draft a pre-COVID 19 pandemic outreach plan for the project comprised of a series of in-person meetings held throughout the region planned for March 2020.

Given the abrupt suspension to in-person meetings caused by the societal upheaval of the onset of the COVID-19 pandemic, in May 2020 staff sent out a second survey to gauge stakeholders ability to participate in the project given the COVID-19 pandemic. Staff received an overwhelming response that project work should continue. Based on this response, staff created a pre-recorded project presentation that was distributed to the Basin Planning listserv and posted online in July 2020. Two weeks later, staff hosted an online public workshop and question and answer session attended by nearly 40 participants. Project staff were joined in this effort by the generous participation of staff from OPP, the Office of Information Management and Analysis, and numerous Lahontan Water Board employees. Participants in the online workshop included private citizens, Water Board employees, and representatives from public agencies, interest groups, and two native American tribes. Details of all the public outreach efforts are included in the January 2021 Board Packet for the Bacteria Water Quality Objectives Evaluation Project available on the [Lahontan Region Basin Planning webpage](#).

In preparation for the May 2021 Board workshop, staff met with several project stakeholders to discuss possible options for a Basin Plan Amendment for fecal bacteria WQOs. Those meetings provided an opportunity for staff to answer questions about the evaluation project and hear from interested parties about what topics specific to fecal bacteria water quality objectives were important to them.

### October 2021 CEQA scoping

Public CEQA scoping for this project was announced on August 23<sup>rd</sup>, 2021. On October 14, 2021 staff held a public meeting to solicit public input regarding the scope of environmental analyses to be performed in preparation of the Basin Plan amendment. This meeting was prepared in accordance with CEQA and provided opportunity for stakeholders and members of the public to ask staff process-related questions and provide verbal comments about the project. Written comments were solicited and

encouraged, and the deadline for receipt of written comments was Friday, October 29th, 2021 at 5:00 p.m.

The scoping meeting was attended by eleven interested parties, several of whom asked staff process-related questions. During the meeting one email comment was received opposing the removal of fecal coliform WQO from the Basin Plan. This comment was read into the record. One comment letter in support of removing fecal coliform from the Basin Plan was received during the comment period. Staff considered the contents of all comments during preparation of the BPA and development of the SED and supporting staff report.

The CEQA scoping meeting was originally planned for September 2021. The meeting was postponed to October 2021 because of the emergency closure of the Water Boards' South Lake Tahoe office due to the Caldor Fire evacuations. Staff also extended the written comment period deadline as a result of the Caldor Fire.

The draft Fecal Bacteria Water Quality Objectives Basin Plan Amendment and this supporting Staff Report and SED were circulated for a 45-day public review with circulation of the Water Boards' March 2022 Board Meeting Agenda. The comment period is scheduled to close in mid-April 2022. A workshop on the BPA is scheduled for the March 2022 Water Board meeting. Responses to comments and any changes to the draft documents will occur during Spring and Summer 2022. Final drafts of all project documents will be circulated for public review ahead of a November 2022 Water Board hearing regarding the project.

### **15 Peer Review**

The California Health and Safety Code section 57004 requires external scientific peer review of the scientific basis for any rule proposed by any board, office or department within California Environmental Protection Agency (CalEPA). Scientific peer review is a mechanism for ensuring that regulatory decisions and initiatives are based on sound science. Scientific peer review also helps strengthen regulatory activities, establishes credibility with stakeholders and ensures that public resources are managed effectively.

The scientific and technical elements of this BPA rely on the previously peer reviewed U.S. EPA 2012 Recreational Water Quality Criteria. The BPA is also supported by the analyses and review contained in the State Water Board *Bacteria Provisions*. Because the scientific and technical elements that support this amendment have been previously reviewed, further scientific peer review is not necessary. Details of the peer review that supports this amendment are available via the *Bacteria Provisions* Staff Report Section 11 and via the U.S. EPA 2012 Recreational Water Quality Criteria documentation.

U.S EPA documents go through several rounds of peer review prior to publication, sometimes including specific aspects of U.S. EPA documents being published in peer reviewed journals. In the case of the U.S. EPA 2012 Recreational Water Quality Criteria, the process started with numerous expert workshops that helped to frame the scope and science that was needed for the new criteria. The U.S. EPA 2012

Recreational Water Quality Criteria was developed by an inter-agency workgroup (called the Action Development Process Workgroup) that met weekly for several years. The document went through multiple rounds of internal management review in many different U.S. EPA offices (Office of Science & Technology, Office of Research and Development, Office of General Council, Office of Wetlands Oceans and Watersheds, Office of Wastewater Management, Office of Science Policy, Office of Children's Health Protection, and all Regional offices) (Soller, Jeff 2005).

Before the U.S. EPA 2012 Recreational Water Quality Criteria was published, it went through an external peer review which consisted of a panel of five external experts, and Public Comment. The peer review is available as the Meeting Report for *The Peer Review of U.S. EPA's Draft Recreational Water Quality Criteria (RWQC) document dated November 1, 2011* (U.S. EPA 2011).

The U.S. EPA 2012 Recreational Water Quality Criteria document was published November 26, 2012 after updates resulting from Peer Review and Public Comment, receiving additional rounds of management review from all U.S. EPA offices, and passing Final Agency Review.

## **16 List of Preparers**

The Basin Plan amendments, technical staff report, and draft environmental document were prepared by Ed Hancock, Environmental Scientist at the Water Board's South Lake Tahoe office.

The October 14, 2021 CEQA Scoping Meeting was prepared and presented by Mr. Hancock. A recording of the meeting is available at the [project webpage](https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/#basin) ([https://www.waterboards.ca.gov/lahontan/water\\_issues/programs/basin\\_plan/#basin](https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/#basin)).

The following additional Water Board staff provided management direction regarding the project, provided information used in preparation of the Basin Plan amendment and related documents, and reviewed preliminary drafts:

### **At the Water Board's South Lake Tahoe Office**

- (1) Andrew Jensen
- (2) Daniel Sussman

## 17 References

Abt Associates Inc. 2017. ***Economic Analysis of Proposed Water Quality Objectives for Pathogens in the State of California.***

Lahontan Regional Water Quality Control Board (Water Board). As amended through September 22, 2021. ***Water Quality Control Plan for the Lahontan Region***

Lahontan Regional Water Quality Control Board (Water Board). 2019. ***Clean Water Act Sections 305(b) and 303(d) 2018 Integrated Report for the Lahontan Region Staff Report*** Resolution No. R6T-2019-0276

Los Angeles Water Quality Control Board (LARWQCB). 2020. ***Amendment to the Water Quality Control Plan for the Los Angeles Region (Basin Plan) to Update the Bacteria Objectives for Fresh, Estuarine and Marine Waters Designated for Water Contact Recreation, based on the Statewide Bacteria Provisions*** Resolution No. R20-001

Soller, Jeff, U.S. EPA. 2005. ***Email Communication regarding USEPA Peer Review of the 2012 Recreational Water Quality Criteria.***

State Water Resources Control Board (State Water Board). 1968. ***Statement with respect to maintaining high quality of waters in California*** Resolution No 68-16

State Water Resources Control Board (State Water Board). 2018. ***Part 3 of the Water Quality Control Plan for Inland Waters, Enclosed Bays, and Estuaries of California—Bacteria Provisions and a Water Quality Standards Variance Policy***

State Water Resources Control Board (State Water Board). 2018. ***Resolution No. 2018-0038 Part 3 of the Water Quality Control Plan for Inland Waters, Enclosed Bays, and Estuaries of California—Bacteria Provisions and a Water Quality Standards Variance Policy***

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United States Environmental Protection Agency (U.S. EPA). 1986. ***Ambient Water Quality Criteria for Bacteria – 1986.*** EPA440/5-84-002.

United States Environmental Protection Agency (U.S. EPA). 2004. ***Implementation Guidance for Ambient Water Quality Criteria for Bacteria.*** EPA-823-B-04-002.

United States Environmental Protection Agency (U.S. EPA). 2011. ***Meeting Report for the Peer Review of EPA’s Draft Recreational Water Quality Criteria (RWQC) Document.*** Submitted by Eastern Research Group. Final Meeting Report: November 1, 2011. EPA-HQ-OW-2011-0466-0107.

United States Environmental Protection Agency (U.S. EPA). 2012 ***Recreational Water Quality Criteria*** EPA 820-F-12-058.

# **ENCLOSURE 2**



# DRAFT

*[The entirety of the following text, except the italicized annotations, is proposed to be adopted as the Fecal Bacteria Water Quality Objectives Basin Plan Amendment (Bacteria WQOs BPA). The Bacteria WQOs BPA would constitute new regulatory language. Several editorial revisions may be made when the Bacteria WQOs BPA is incorporated into the Water Quality Control Plan for the Lahontan Region (Basin Plan). Editorial revisions may include, but are not limited to, changes to the title page, table of contents, appendices, page numbers, table and figure numbers, footnote numbers, headers and footers, and other non-substantive changes to improve accessibility of the document.]*

## **Basin Plan Amendments for fecal bacteria water quality objectives**

*[The amendments include changes to Basin Plan Chapter 3 (water quality objectives) and Chapter 5 (water quality standards and control measures for the Lake Tahoe Basin). Text that will be removed from the Basin Plan preceded with '[The following text is removed]:,' text that will be added to the Basin Plan is preceded with '[The following text is inserted]:']*

### *Changes to Basin Plan Chapter 3, Page 4*

*[The following text is removed]:*

#### **Bacteria, Coliform**

Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.

The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml. The log mean shall ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 ml for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.

*[The following text is inserted]:*

#### **Fecal Indicator Bacteria**

Waters shall not contain concentrations of fecal material deleterious to beneficial uses.

Compliance with the narrative bacteria water quality objectives may be determined by use of Fecal Indicator Bacteria (FIB) water quality monitoring, such as *Escherichia Coli* (*E. coli*) or Enterococci, genetic testing, or other appropriate methods.

Surface waters designated for Water Contact Recreation (REC-1):

The State Water Resources Control Board (State Water Board) established two bacteria water quality objectives applicable to all surface waters with the REC-1 beneficial use, depending on the salinity level, and an implementation plan in 'Part 3 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California — Bacteria Provisions and a Water Quality Standards Variance Policy' (Bacteria Provisions)' adopted with State Water Board Resolution No. 2018-0038. The Bacteria Provisions should be consulted in their entirety for a complete accounting of the water quality objectives and associated implementation provisions. The water quality objectives are summarized below.

Escherichia Coli (E. coli)

The bacteria water quality objective for all waters where the salinity is equal to or less than 1 part per thousand (ppt) 95 percent or more of the time during the calendar year is: a six-week rolling geometric mean (GM) of E. coli not to exceed 100 colony forming units (cfu) per 100 milliliters (mL), calculated weekly, and a Statistical Threshold Value (STV) of 320 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.

United States Environmental Protection Agency (U.S. EPA) recommends using U.S. EPA Method 1603 or other equivalent method to measure culturable E. coli.

Enterococci

The bacteria water quality objective for all waters where the salinity is greater than 1 ppt more than 5 percent of the time during the calendar year is: a six-week rolling geometric mean of enterococci not to exceed 30 cfu/100 mL, calculated weekly, with a STV of 110 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.

U.S. EPA recommends using U.S. EPA Method 1600 or other equivalent method to measure culturable enterococci.

**Table 3 - 0. REC-1 Bacteria Water Quality Objectives**

Applicable Waters	Objective Elements	Estimated Illness Rate (NGI): 32 per 1,000 water contact recreators Magnitude (cfu/100 ml)	
		GM	STV
All waters where the salinity is equal to or less than 1 ppt 95 percent or more of the time	E. coli	100	320
All waters where the salinity is greater than 1 ppt more than 5 percent of the time	Enterococci	30	110

Table notes:

1. The waterbody GM shall not be greater than the applicable GM magnitude in any six-week interval, calculated weekly. The applicable STV shall not be exceeded by more than 10 percent of the samples collected in a CALENDAR MONTH, calculated in a static manner.
2. NGI = National Epidemiological and Environmental Assessment of Recreational Water gastrointestinal illness rate
3. GM = geometric mean
4. STV = statistical threshold value
5. cfu = colony forming units
6. ppt = parts per thousand
7. ml = milliliters

*Changes to Basin Plan Chapter 3, Page 6, Susanville Hydrologic Unit*

*[The following text is removed]:*

### **Bacteria, Fecal Coliform**

The fecal coliform concentration based on a minimum of not less than five samples for any 30- day period, shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of total samples during any 30-day period exceed 75/100 ml.

*Changes to Basin Plan Chapter 3, Page 16, 'References to "Means" ...'*

*[The following text is removed]:*

### **References to "Means" (e.g., annual mean, log mean, mean of monthly means), "Medians" and "90th Percentile Values"**

**"Mean"** is the arithmetic mean of all data. **"Annual mean"** is the arithmetic mean of all data collected in a one-year period. **"Mean of monthly means"** is the arithmetic mean of 30-day averages (arithmetic means). A logarithmic or **"log mean"** (used in determining compliance with bacteria objectives) is calculated by converting each data point into its log, then calculating the mean of these values, then taking the anti-log of this log transformed average. The **median** is the value that half of the values of the population exceed, and half do not. The **average value** is the arithmetic mean of all data. For a **90th percentile value**, only 10% of data exceed this value.

*[The following text is inserted]:*

### **References to "Means" (e.g., annual mean, geomean, mean of monthly means), "Medians", "90th Percentile Values" and Statistical Threshold Values**

**"Mean"** is the arithmetic mean of all data. **"Annual mean"** is the arithmetic mean of all data collected in a one-year period. **"Mean of monthly means"** is the arithmetic mean of 30-day averages (arithmetic means). A geometric mean or **"geomean"** is a type of

mean that indicates the central tendency or typical value of a set of numbers by using the product of their values (as opposed to the arithmetic mean which uses their sum). The geometric mean is defined as the nth root of the product of n numbers. The formula is expressed as:  $GM = \sqrt[n]{(x_1)(x_2)(x_3) \dots (x_n)}$ , where x is the sample value and n is the number of samples taken. The **median** is the value that half of the values of the population exceed, and half do not. The **average value** is the arithmetic mean of all data. For a **90th percentile value**, only 10% of data exceed this value. A **statistical threshold value (STV)** for the fecal indicator bacteria water quality objectives is a set value that approximates the 90th percentile of the water quality distribution of a bacterial population.

#### *Changes to Basin Plan Chapter 3, Page 16, 'bacterial analyses' paragraph*

*[The following text is removed]:*

For bacterial analyses sample dilutions should be performed so the range of values extends from 2 to 16,000. The detection method used for each analysis shall be reported with the results of the analysis. Detection methods used for coliforms (total and fecal) shall be those presented in Standard Methods for the Examination of Water and Wastewater (American Public Health Association et al.), or any alternative method determined by the Regional Board to be appropriate.

*[The following text is inserted]:*

For bacterial analyses, the detection method used for each analysis shall be reported with the results of the analysis. Detection methods used for fecal indicator bacteria (FIB) shall be those presented in the most recent addition of Standard Methods for the Examination of Water and Wastewater (American Public Health Association et al.), or any alternative method determined by the Regional Board to be appropriate.

#### *Changes to Basin Plan Chapter 4, Page 19, column 2, paragraph 1*

*[The following text is removed]:*

Rangeland streams can show increased coliform bacterial levels with fecal coliform levels tending to increase as intensity of livestock use increases. Fecal coliforms serve as indicators that pathogens could exist and flourish.

*[The following text is inserted]:*

Rangeland streams may be impacted by fecal bacteria, demonstrated by increased fecal indicator bacteria levels as intensity of livestock use increases. Fecal indicator bacteria are indicators that pathogens may be present in a surface water.

#### *Changes to Basin Plan Chapter 5.1, Page 6*

*[The following text is deleted]:*

## **Bacteria, Coliform**

Waters shall not contain concentrations of coliform organisms attributable to anthropogenic sources, including human and livestock wastes.

The fecal coliform concentration during any 30-day period shall not exceed a log mean of 20/100 ml, nor shall more than 10 percent of all samples collected during any 30-day period exceed 40/100 ml. The log mean shall ideally be based on a minimum of not less than five samples collected as evenly spaced as practicable during any 30-day period. However, a log mean concentration exceeding 20/100 ml for any 30-day period shall indicate violation of this objective even if fewer than five samples were collected.

*[The following text is inserted]:*

### **Fecal Indicator Bacteria**

Waters shall not contain concentrations of fecal material deleterious to beneficial uses.

Compliance with the narrative bacteria water quality objectives may be determined by use of Fecal Indicator Bacteria (FIB) water quality monitoring, such as *Escherichia Coli* (*E. coli*) or Enterococci, genetic testing, or other appropriate methods.

#### Surface waters designated for Water Contact Recreation (REC-1):

The State Water Resources Control Board (State Water Board) established two bacteria water quality objectives applicable to all surface waters with the REC-1 beneficial use, depending on the salinity level, and an implementation plan in 'Part 3 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California — Bacteria Provisions and a Water Quality Standards Variance Policy' (Bacteria Provisions)' adopted with State Water Board Resolution No. 2018-0038. The Bacteria Provisions should be consulted in their entirety for a complete accounting of the water quality objectives and associated implementation provisions. The water quality objectives are summarized below.

#### *Escherichia Coli* (*E. coli*)

The bacteria water quality objective for all waters where the salinity is equal to or less than 1 part per thousand (ppt) 95 percent or more of the time during the calendar year is: a six-week rolling geometric mean (GM) of *E. coli* not to exceed 100 colony forming units (cfu) per 100 milliliters (mL), calculated weekly, and a Statistical Threshold Value (STV) of 320 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.

United States Environmental Protection Agency (U.S. EPA) recommends using U.S. EPA Method 1603 or other equivalent method to measure culturable *E. coli*.

## Enterococci

The bacteria water quality objective for all waters where the salinity is greater than 1 ppt more than 5 percent of the time during the calendar year is: a six-week rolling geometric mean of enterococci not to exceed 30 cfu/100 mL, calculated weekly, with a STV of 110 cfu/100 mL not to be exceeded by more than 10 percent of the samples collected in a calendar month, calculated in a static manner.

U.S. EPA recommends using U.S. EPA Method 1600 or other equivalent method to measure culturable enterococci.

**Table 5 - 0. REC-1 Bacteria Water Quality Objectives**

Applicable Waters	Objective Elements	Estimated Illness Rate (NGI): 32 per 1,000 water contact recreators Magnitude (cfu/100 ml)	
		GM	STV
All waters where the salinity is equal to or less than 1 ppt 95 percent or more of the time	E. coli	100	320
All waters where the salinity is greater than 1 ppt more than 5 percent of the time	Enterococci	30	110

Table notes:

1. The waterbody GM shall not be greater than the applicable GM magnitude in any six-week interval, calculated weekly. The applicable STV shall not be exceeded by more than 10 percent of the samples collected in a CALENDAR MONTH, calculated in a static manner.
2. NGI = National Epidemiological and Environmental Assessment of Recreational Water gastrointestinal illness rate
3. GM = geometric mean
4. STV = statistical threshold value
5. cfu = colony forming units
6. ppt = parts per thousand
7. ml = milliliters

*Changes to Basin Plan Chapter 5.1, Page 12, 'References to "Means"...*

*[The following text is removed]:*

**References to "Means" (e.g., annual mean, log mean, mean of monthly means), "Medians" and "90th Percentile Values"**

**"Mean"** is the arithmetic mean of all data. **"Annual mean"** is the arithmetic mean of all data collected in a one-year period. **"Mean of monthly means"** is the arithmetic mean

of 30-day averages (arithmetic means). A logarithmic or “**log mean**” (used in determining compliance with bacteria objectives) is calculated by converting each data point into its log, then calculating the mean of these values, then taking the anti-log of this log transformed average. The **median** is the value that half of the values of the population exceed, and half do not. The **average value** is the arithmetic mean of all data. For a **90th percentile value**, only 10% of data exceed this value.

*[The following text is inserted]:*

### **References to “Means” (e.g., annual mean, geomean, mean of monthly means), “Medians”, “90th Percentile Values” and Statistical Threshold Values**

“**Mean**” is the arithmetic mean of all data. “**Annual mean**” is the arithmetic mean of all data collected in a one-year period. “**Mean of monthly means**” is the arithmetic mean of 30-day averages (arithmetic means). A geometric mean or “**geomean**” is a type of mean that indicates the central tendency or typical value of a set of numbers by using the product of their values (as opposed to the arithmetic mean which uses their sum). The geomean is defined as the nth root of the product of n numbers. The formula is expressed as:  $GM = \sqrt[n]{(x_1)(x_2)(x_3) \dots (x_n)}$ , where x is the sample value and n is the number of samples taken. The **median** is the value that half of the values of the population exceed, and half do not. The **average value** is the arithmetic mean of all data. For a **90th percentile value**, only 10% of data exceed this value. A **statistical threshold value (STV)** for the fecal indicator bacteria water quality objectives is a set value that approximates the 90th percentile of the water quality distribution of a bacterial population.

*Changes to Basin Plan Chapter 5.1, Page 12, ‘bacterial analyses’ paragraph*

*[The following text is removed]:*

For bacterial analyses sample dilutions should be performed so the range of values extends from 2 to 16,000. The detection method used for each analysis shall be reported with the results of the analysis. Detection methods used for coliforms (total and fecal) shall be those presented in Standard Methods for the Examination of Water and Wastewater (American Public Health Association et al.), or any alternative method determined by the Regional Board to be appropriate.

*[The following text is inserted]:*

For bacterial analyses, the detection method used for each analysis shall be reported with the results of the analysis. Detection methods used for fecal indicator bacteria (FIB) shall be those presented in the most recent addition of Standard Methods for the Examination of Water and Wastewater (American Public Health Association et al.), or any alternative method determined by the Regional Board to be appropriate.