August 2019 Addendum to the Staff Report for the Action Plan for the Russian River Watershed Pathogen Total Maximum Daily Load

This addendum constitutes all of the revisions to the *Staff Report for the Action Plan for the Russian River Watershed Pathogen Total Maximum Daily Load* (May 2019 version) that resulted from public comments received on the staff report during the 45-day public comment period that concluded on June 24, 2019. The time period between the end of the public comment period and the date for publishing final material for the August 14, 2019 Board Meeting was insufficient to reproduce a final staff report, given a new obligation to ensure compliance with accessibility requirements. A final staff report that incorporates the revisions described below may be made available later, following remediation of the staff report to comport with accessibility requirements.

Cover Page and Front Matter

1. Cover page, revise title to read "Staff Report for the Action Plan for the Russian River Watershed Pathogen Total Maximum Daily Load (FINAL), Revised August 2019".
2. Front matter, revise dates of adoption and approval to include actual dates of adoption and approval.

Chapter 1- Introduction

3. Section 1.2 (Project History), page 1-4. Revise the third paragraph, second sentence to read "significant comments submitted during the 2015, 2017 and 2019 public review periods."
4. Section 1.3.1 (Section 303(d) Listing), page 1-5. Revise second full paragraph, fourth sentence to read "The analysis for both proposed actions relies on *E. coli* and enterococci in a manner consistent with statewide bacteria objectives as well as enterococci in freshwaters, where combined with other lines of evidence of pollution (e.g., public health advisories) as described in more detail in Chapter 4."

Chapter 2- Watershed Setting

5. Section 2.2 (Hydrology), page 2-4. Revise the first paragraph, third sentence, capacity of Lake Mendocino to read 166,500 acre-feet.
6. Section 2.4 (Recreational Uses), Table 2.4 (Popular Swimming Beaches along the Russian River). Revise Table 2.4 to include the HUC-12 subwatershed names for each identified recreational beach as follows:
    a. Mariposa Swimming Hole—Salt Hollow Creek-Russian River HUC-12 subwatershed
    b. Vichy Springs Park—Orrs Creek-Russian River HUC-12 subwatershed
    c. Mill Creek Park—Mill Creek HUC-12 subwatershed
    d. Cloverdale River Park—Oat Valley Creek-Russian River HUC-12 subwatershed
    e. Alexander Valley Campground—Sausal Creek-Russian River HUC-12 subwatershed
    f. Camp Rose Beach—Brooks Creek-Russian River HUC-12 subwatershed
    g. Veteran's Memorial Beach (Healdsburg)—Brooks Creek-Russian River HUC-12 subwatershed
    h. Riverfront Park—Porter Creek-Russian River HUC-12 subwatershed
    i. Mirabel Park Campground—Porter Creek-Mark West Creek HUC-12 subwatershed
    j. Steelhead Beach—Porter Creek-Russian River HUC-12 subwatershed

k. Sunset Beach—Dutch Bill Creek-Russia River HUC-12 subwatershed
l. Johnson's Beach—Dutch Bill Creek-Russian River HUC-12 subwatershed
m. Monte Rio Beach—Dutch Bill Creek-Russian River HUC-12 subwatershed
n. Patterson Beach—Dutch Bill Creek-Russian River HUC-12 subwatershed
o. Cassini Ranch Campground (West)—Dutch Bill Creek-Russian River HUC-12 subwatershed
p. Cassini Ranch Campground (East)—Willow Creek-Russian River HUC-12 subwatershed

Chapter 3- Bacteria Standards and Other Indicators

7. Section 3.2.1.2 (E. Coli Bacteria and Enterococci Bacteria), page 3-8. Revise the second paragraph, second to last sentence to read "This TMDL also identifies impaired HUC-12 subwatersheds based on exceedances of the national criteria for enterococci in freshwaters, when coupled with another line of evidence of pollution (e.g., public health advisories)."

Chapter 4- Evidence of Pollution

8. Section 4.1 (Overview), page 4-4 through 4-6. Update Table 4.1 Sample Locations to correct the name of an unnamed tributary at Diver Drive in Dutch Bill Creek HUC-12 subwatershed to read "River Dr." Also, update Table 4.1 to give the complete name for individual HUC-12 subwatersheds. For example, many HUC-12 subwatersheds include a tributary stream and a portion of the Russian River mainstem. Corrections are as follows:
    - East Fork Russian River is East Fork Russian River-Russian River
    - Orrs Creek is Orrs Creek-Russian River
    - McNab Creek is McNab Creek-Russian River
    - Cooley Creek is Dooley Creek
    - Cumminskey Creek is Cumminsky Creek-Russian River
    - Soda Spring Creek is Soda Spring Creek-Dry Creek
    - Lake Sonoma is Lake Sonoma-Dry Creek
    - West Slough is West Slough-Dry Creek
    - Gill Creek is Gill Creek-Russian River
    - Sausal Creek is Sausal Creek-Russian River
    - Brooks Creek is Brooks Creek-Russian River
    - Ward Creek is Ward Creek-Austin Creek
    - Porter Creek is Porter Creek-Russian River
    - Dutch Bill Creek is Dutch Bill Creek-Russian River
    - Willow Creek is Willow Creek-Russian River

9. Section 4.5 (Microbiological Source Identification), page 4-24. Revise the sentence beginning "Dubinsky and Anderson (2014) recommend a threshold of 20% DNA match as significant…" and the rest of the paragraph to read as follows. "Dubinsky and Andersen (2014) recommend a threshold of 20% DNA match as strong evidence of fecal waste; Dubinsky (personal communication, July 8, 2019) identifies 10% DNA match as moderate evidence of fecal waste. Dubinsky, Butkus, and Andersen (2016) reassessed the Russian River DNA data, calculating the moderate and strong probability of bacteriological communities representing a specific fecal waste source category (e.g., human, ruminant, dog). The results of the study: 1) identify key

locations in the watershed with evidence of human or ruminant fecal waste signals and 2) the presence of specific pathogenic bacteria. The study also concludes that high FIB concentrations, as measured against instantaneous beach action values, were often due to non-fecal related bacterial populations, perhaps enhanced by nutrient and carbon enriched runoff. Instantaneous FIB concentrations were not well correlated with PhyloChip™ fecal waste signals."

10. Section 4.5.2 (Results), page 4-25. Revise first full sentence and the rest of the paragraph to read "Sample locations where the gene sequence percent match exceeds 10% and 20% represent locations with moderate and strong evidence, respectively, of a source of fecal waste requiring control (personal communication, Eric Dubinsky, July 8, 2019). Please note that only 15 of the 43 HUC-12 subwatersheds were measured using the PhyloChip™ DNA microarray technique."
11. Section 4.5.2 (Results), page 4-25. Revise the first full paragraph to read "Of the 15 HUC-12 subwatersheds monitored using the PhyloChip™ DNA microarray technique, 4 contained locations where the human gene sequence percent match exceeds 20% (i.e., Upper Laguna de Santa Rosa, Lower Santa Rosa Creek, Porter Creek-Russian River, and Dutch Bill Creek-Russian River HUC-12 subwatersheds) and an additional 3 (i.e., Brooks Creek-Russian River, West Slough-Dry Creek, and Willow Creek-Russian River HUC-12 subwatersheds) contained locations where the human gene sequence percent match exceeds 10%. The Lower Laguna de Santa Rosa contained a location where the human gene sequence percent match was measured as 9%. Similarly, 6 HUC-12 subwatersheds (i.e., Sausal Creek-Russian River, Upper Laguna de Santa Rosa, Lower Laguna de Santa Rosa, Lower Sant Rosa Creek, Porter Creek-Russian River, and Dutch Bill Creek-Russian River) contained locations with evidence where the grazer gene sequence percent match exceeds 10%."
12. Section 4.5.2 (Results), page 4-25. Revise last paragraph to read "None of the HUC-12 subwatersheds measured showed bird gene sequences exceeding the 20% threshold, though Mill Creek, West Slough-Russian River, Upper Laguna de Santa Rosa, Lower Santa Rosa Creek, Porter Creek-Russian River, and Dutch Bill Creek-Russian River HUC-12 subwatersheds all exceeded 10% bird gene sequence match.
13. Section 4.5.2 (Results), Table 4.6 (Bacteria DNA Sequences – Human Fecal Waste), page 4-25. Revise the table to use **bold** font for the following HUC-12 subwatersheds: Brooks Creek-Russian River, West Slough-Russian River, and Willow Creek-Russian River. Revise the Table footnote to read "HUC-12 subwatersheds, where the percent gene sequence match of a sample to a known source of fecal waste exceeds 10% or 20% are highlighted in **bold.** These are HUC-12 subwatersheds with moderate and strong evidence, respectively, of human fecal waste discharge."
14. Section 4.5.2 (Results), Table 4.7 (Bacteria DNA Sequences – Grazer Fecal Waste), page 4-27. Revise the table to use **bold** font for the following HUC-12 subwatersheds: Sausal Creek-Russian River and Lower Laguna de Santa Rosa. Revise the Table footnote to read "HUC-12 subwatersheds, where the percent gene sequence match of a sample to a known source of fecal waste exceeds 10% or 20% are highlighted in **bold.** These are HUC-12 subwatersheds with moderate and strong evidence, respectively of grazer fecal waste discharge."
15. Section 4.5.2 (Results), Table 4.8 (Bacteria DNA Sequences – Bird Fecal Waste), page 4-28. Revise the table to use **bold** font for the following HUC-12 subwatersheds: Mill Creek, West Slough-Russian River, Upper Laguna de Santa Rosa, Lower Santa Rosa Creek, Porter Creek-Russian River, and Dutch Bill Creek-Russian River. Revise the Table footnote to read "HUC-12

subwatersheds, where the percent gene sequence match of a sample to a known source of fecal waste exceeds 10% are highlighted in **bold.** These are HUC-12 subwatersheds with moderate evidence of bird fecal waste discharge."

16. Section 4.7 (Public Health Advisories), page 4-32. Revise the first paragraph of Section 4.7 beginning with the second to last sentence (now starting "Table 4.11 lists the number of days with posted advisories…") to be replaced with "The Sonoma County Department of Health Services posted public health advisories a total of 145 days at a number of popular Russian River swimming beaches in the period of 2001 through 2011. Postings were based on exceedances of beach action values for total coliform, *E. coli*, or enterococci. Table 4.11 lists the number of days with posted advisories in the period of 2013 to 2018, when only those exceedances of beach action values for total coliform and *E. coli* were used."
17. Section 4.7 (Public Health Advisories), Table 4.11 (Russian River Beach Advisories Issued by the Sonoma Co. Department of Health Services), page 4-33. Delete Table 4.11 and replace it with the following:

Table 4.11 Russian River Beach Advisories Issued by the Sonoma County Department of Health Services from 2013-2018

Year	**Cloverdale River Park** Oat Valley Creek-Russian River HUC-12 Subwatershed (# of posted days0	**Veterans Memorial Beach** Brooks Creek-Russian River HUC-12 Subwatershed (# of posted days)	**Johnsons Beach** Dutch Bill Creek-Russian River HUC-12 Subwatershed (# of posted days)	**Monte Rio Beach** Dutch Bill Creek-Russian River HUC-12 Subwatershed (# of posted days)
2013	1	4	1	7
2014	3	0	0	0
2015	11	0	1	6
2016	0	0	0	0
2017	0	0	0	4
2018	0	0	0	0
TOTAL	15	4	2	17

18. Section 4.8 (Summary), page 4-33. Replace the first paragraph with the following. "The statewide bacteria objectives and national criteria for the protection of REC-1 are based on fecal indicator bacteria (i.e., *E. coli* and enterococci) that are typically associated with fecal waste discharge and epidemiologically-derived risk of gastrointestinal illness. The scientific peer review for this project illuminated the value of enterococci over *E. coli* as a fecal indicator bacteria due to the strength of the related epidemiology. The statewide bacteria objective adoption process illuminated the value of *E. coli* over enterococci based on the potential for enterococci results to be influenced by environmental factors. Based on the PhyloChip™ study, both *E. coli* and enterococci sometimes appear to pick up shifts in environmental bacterial

populations, perhaps due to enriched concentrations of carbon or nitrogen in runoff. Thus both *E. coli* and enterococci have the potential to be influenced by environmental factors. The TMDL process relies on the Identification of areas of pollution/impairment by comparing the geomean and statistical threshold value calculations of all *E. coli* and enterococci data against the given standards, plus any direct evidence of beneficial use impairment (e.g., public health advisories on public swimming beaches). But, the other lines of evidence, such as provided by *Bacteroides* monitoring data and PhyloChip™ phylogenetic DNA microarray results, serve to inform a narrowed area of focus. Congregating all of the lines of evidence by HUC-12 subwatershed provides a reasonably clear picture of 1) the total number of subwatersheds within which there is an elevated human health risk (e.g., exceedance of state objectives and/or national criteria and posted public health advisories), 2) the subset of subwatersheds where there is a human and/or bovine fecal waste signature (e.g., high *Bacteroides* concentrations and/or PhyloChip™ DNA evidence), and 3) the subset of subwatersheds where there is high *E. coli* concentrations but no human or bovine fecal waste signature and further assessment is warranted (e.g., impaired/polluted subwatersheds with low *Bacteroides* and PhyloCHip™ DNA results). Finally, direct measurement of pathogenic species expands the range of public health concerns from gastrointestinal illness as associated with exceedance of *E. coli* and enterococci to include exposure to bacteria responsible for such illnesses as urinary tract infections, dermal infections, pneumonia, meningitis, and the plague."

19. Section 4.8 (Summary), page 4-33. Delete the second paragraph that reads "Table 4.12 and Figure 4.6 present a summary of the relevant data."
20. Section 4.8 (Summary), Table 4.12 (Weight of Evidence Summary Table), page 4-34. Revise the Public Health Advisory column to remove the "x" for Sausal Creek-Russian River HUC-12 subwatershed. Change the **bolded** font to regular font. Revise the Bovine *Bacteroides* column to change the "x" for Sausal Creek-Russian River HUC-12 subwatershed to "X". Revise the Human DNA column to change the "x" for Brooks Creek-Russian River, West Slough-Dry Creek, and Willow Creek-Russian River HUC-12 subwatersheds to an "X". Revise the Grazer DNA column to change the "x" for Lower Laguna de Santa Rosa HUC-12 subwatershed to an "X". Revise the Table footnote #5 to read "PhyloChip™ data indicate the percent of a sample that marches known gene sequences of specific source animals. A threshold of 10% and 20% gene sequence match with a known fecal waste source (e.g., human, grazer) was used as moderate and strong evidence, respectively, of the presence of host fecal waste. These data were used for informational purposes, only."
21. Section 4.8 (Summary), Figure 4.6 (Weight of Evidence Summary), page 4-36. Delete the figure because it inadequately represents the complexity of the weight of evidence. There is no figure to replace it.
22. Section 4.8 (Summary), page 4-37. Revise the first bulleted list to remove Sausal Creek-Russian River. Follow the first bulleted list with a paragraph that reads "Of the impaired/polluted HUC-12 subwatersheds, the following also show evidence of a human fecal waste signature: Brooks Creek-Russian River, West Slough-Dry Creek, Upper Laguna de Santa Rosa, Lower Santa Rosa Creek, Porter Creek-Russian River, Dutch Bill Creek-Russian River, and Willow Creek-Russian River. The Lower Laguna de Santa Rosa HUC-12 subwatershed shows low to moderate evidence of a human fecal waste signature, but strong evidence of impairment and should be highlighted for source control."

23. Section 4.8 (Summary), page 4-37. Add the Sausal Creek-Russian River HUC-12 subwatershed to the second bulleted list. Follow the second bulleted list with a paragraph that reads "The Orrs Creek-Russian River HUC-12 subwatershed shows evidence of a human fecal waste signature based on the high human-sourced *Bacteroides* monitoring results, further indicating the potential for a public health concern."
24. Section 4.8 (Summary), page 4-37. Following the third bulleted list with a paragraph that reads "The Windsor Creek HUC-12 subwatershed is uniquely devoid of pathogen monitoring data, but clearly an area of potential concern. It should be a high priority for future pathogen monitoring, with a particular focus on whether or not there is a human fecal waste signature requiring specific attention."

Chapter 5- Numeric Targets

25. No revisions

Chapter 6 – Source Analysis

26. Section 6.1 (Overview), page 6-1. Revise the third paragraph, second to last sentence to read "Rather, in order to achieve the concentration-based TMDL, each permitted source of waste discharge must meet the concentration-based allocation. Unpermitted discharges must control their waste onsite." The last sentence remains as is.
27. Section 6.2.1 (Methods), page 6-4. Add a final paragraph prior to Section 6.2.2 that reads "Contemporaneous with the FIB monitoring data, PhyloChip™ phylogenetic DNA microarray data was also collected."
28. Section 6.2.2 (Results), page 6-5. Revise the fifth (last) bullet on the page to read "*E. coli*, enterococci, and *Bacteroides* bacteria concentrations are statistically the same for developed sewered areas and developed areas with OWTS…."
29. Section 6.3.1.2 (Recycled Water Holding Ponds), page 6-11. Revise the second paragraph, second sentence to read "The point at which disinfection is complete, for example, at the end of a chlorine contact chamber, may be separated from the surface water discharge by both distance and time."
30. Section 6.3.2.1 (Municipal Storm Water), page 6-23. Revise the second paragraph, fourth sentence to read "Storm water samples are collected by the City of Santa Rosa, the County of Sonoma, the Town of Windsor, the City of Rohnert Park, the City of Cotati, and the City of Sebastopol as a requirement of the Phase I MS4 permit to implement an outfall monitoring program."
31. Section 6.3.3 (Point Source Conclusions), page 6-27. Revise the first paragraph, first sentence to read "More site-specific information is necessary, however, to determine the sources of E. coli or other fecal indicator bacteria in recycled water storage ponds and whether the discharge from a recycled water storage pond contains pathogens that are infectious to humans before the holding pond can be eliminated as a pathogen source."
32. Section 6.4.1 (Municipal Wastewater Discharges to Land), Table 6.6 (Municipal WDR Wastewater Treatment Facilities in the Russian River Watershed, page 6-30. Revise the permit number for the Geyserville Sanitation Zone to "R1-2019-0013," the permit number for the Calpella County Water District to "R1-2019-0010," and the permit number for the Airport-Larkfield-Wikiup Sanitation Zone to "R1-2019-0007."

33. Section 6.5.3 (Livestock Waste), page 6-47. Revise Table 6.11 to refer to "Cattle and Calves" in place of "Cows." Update Mendocino County data to read "18,100" for the total number of animals that are cattle and calves. Update Mendocino County data to read "9,000" for the total number of animals that are sheep and lambs.
34. Section 6.6 (Source Analysis Conclusions), page 6-52. Revise the bullet "Runoff from Water Recycling Projects" to read "Runoff from Irrigation of Recycled Water."
35. Section 6.6 (Source Analysis Conclusions), page 6-52. Add to the bulleted list of sources of human fecal waste material, following the bullet "Runoff from Water Recycling Projects," a bullet and text to read "Runoff from sites that receive discharges of waste to land."
36. Section 6.6 (Source Analysis Conclusions), page 6-52. Revise the bullet "Storm Water to Municipal Separate Storm Sewer Systems (MS4s) and Areas Outside of MS4 Boundaries, including CalTrans stormwater runoff" to read "Stormwater runoff entering Municipal Separate Storm Sewer Systems (MS4s) and entering water bodies outside established MS4 boundaries, including CalTrans stormwater runoff."

Chapter 7—TMDL Calculations and Allocations

37. No revisions.

Chapter 8—Linkage Analysis

38. Section 8.3 (Risk of Contact with Fecal Waste), page 8-3. Add a paragraph just prior to the concluding paragraph of this section that reads "PhyloChip™ phylogenetic DNA microarray results did not correlate *with E. coli*, enterococci, or *Bacteroides* on a sample-by-sample basis. But, when congregated with other FIB data by HUC-12 subwatershed, the PhyloChip™ data provides an additional line of evidence of impairment/pollution that corroborates other findings. Most important to the question of human exposure to pathogens, the PhyloChip™ results indicate the presence of numerous pathogens at locations primarily in the lower Russian River area that cause not only gastrointestinal illness, but urinary tract infections, dermal infections, pneumonia, meningitis, and in at least one location, the plague."
39. Section 8.4 (Risk of Pathogen-Related Illness), page 8-3. Revise the sentence in the first paragraph of this section, which begins "These locations are contained in the following HUC-12 subwatersheds:" to delete "Sausal Creek-Russian River."
40. Section 8.4 (Risk of Pathogen-Related Illness), page 8-4. Revise the last sentence in the second to last paragraph of this section to read "In addition, multiple advisories against public swimming have been posted in the period of 2013 through 2018 at Cloverdale River Park, Healdsburg Veteran's Memorial Beach, Johnson's Beach, and Monte Rio Beach due to elevated bacteria measurements." Add a new paragraph at the end of this section that reads "PhyloChip™ results did not corelate with the other FIB results on a sample-by-sample basis, likely due to multiple factors including data limitations and environmental factors. But, when evaluated as lines of evidence per HUC-12 subwatershed, the PhyloChip™ results help to distinguish between those HUC-12 subwatersheds where OWTS are a potential source of the FIB exceedances measured and those where there is not currently such evidence. HUC-12 subwatersheds with moderate to strong PhyloChip™ evidence of human fecal waste include: Brooks Creek-Russian River, West Slough-Dry Creek, Upper Laguna de Santa Rosa, Lower Santa Rosa Creek, Porter Creek-Russian River, Dutch Bill Creek-Russian River, and Willow Creek-Russian River."

41. Section 8.5 Attainment of Water Quality Objective, page 8-4. Add a final paragraph to this section that reads "Following implementation of fecal waste control measures, *Bacteroides* measurements can be collected to help identify those locations where continued exceedances of statewide bacteria objectives are related to human or bovine fecal waste discharge versus other environmental factors, should such conditions persist. Further, PhyloChip™ or other similar microbial source tracking methods can also be used."
42. Section 8.6 (Conclusions), page 8-5. Add to the first sentence of the last paragraph of this section a phrase that reads "where high natural background bacterial community richness is not the source of *E. coli* or enterococci exceedances."
43. Section 8.6 (Conclusions), page 8-5. Add a final sentence to the last paragraph that reads "A confirmation study using Bacteroides, PhyloCHip™, or other microbial source tracking method may be conducted, as necessary."

Chapter 9 – Program of Implementation

44. Section 9.1 (Waste Discharge Prohibitions), page 9-1. Revise the prohibition, last sentence of the italicized text to read "Compliance with this prohibition can be achieved by any of the following means, as applicable:"
45. Section 9.1 (Waste Discharge Prohibitions), page 9-2. Revise the first bullet to read "Implement adequate treatment and/or best management practices to prevent the discharge of fecal waste material from humans or domestic animals from entering a water of the state either directly, or indirectly as a result of stormwater runoff."
46. Section 9.2.2 (Wastewater Holding Pond Discharges to Surface Waters), page 9-4. Replace paragraphs 2-5 with the following text:

    "The federal Clean Water Action requires that all NPDES permits include effluent limitations and other requirements to control the amount of wastewater pollutants that are discharged to waters of the United States. All NPDES permits have a maximum duration of five years, at which time they expire, are administratively continued, or are renewed after consideration of information submitted by the discharger characterizing the discharge and demonstrating that the wastewater treatment and disposal systems adequately control wastewater pollutants in the discharge. In addition to applicable technology-based effluent limitations and standards, NPDES permits must also include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where a reasonable potential to exceed those criteria exists. The process for assessing whether a discharge has the reasonable potential to cause or contribute to an exceedance of applicable numeric and narrative water quality criteria is called a reasonable potential analysis (RPA).

    All municipal wastewater treatment facilities discharging directly to surface waters in the Russian River Watershed are regulated under NPDES permits that include WQBELs and disinfection specifications to achieve pathogen reduction in the effluent. The regulated dischargers listed in Section 9.2.1 above maintain reasonably consistent compliance with these limitations and specifications. However, wastewater discharged from municipal wastewater holding ponds, although previously disinfected, is not routinely monitored after prolonged storage and prior to discharge to surface water to detect the presence of fecal indicator

bacteria. In the absence of this effluent monitoring data, it is difficult to determine as part of a RPA whether the discharge has the reasonable potential to cause an exceedance of water quality objectives for bacteria, or a wasteload allocation for bacteria if one has been established.

The Action Plan requires the Regional Water Board to begin conducting RPAs within seven years after the effective date of the Action Plan for entities authorized to discharge treated wastewater from holding ponds to the Russian River or its tributaries and, where reasonable potential to exceed water quality criteria or WLAs is determined, establish WQBELs that implement WLAs in an entity's NPDES permit. In order to complete the RPA for bacteria, the Regional Water Board must have, at a minimum, effluent samples of a sufficient number collected at an appropriate frequency to fully characterize the discharge from the holding pond to surface water. The discharger entity may also provide other pertinent information related to the discharge to determine whether discharges from the holding pond are attaining WLAs. This information could include an assessment of whether the discharge from the holding pond contains viable pathogens that are infectious to humans. An assessment affirming that the discharge of treated municipal wastewater from the holding pond contains no measurable human pathogens can be used by the Regional Water Board to support a determination that there is no reasonable potential for the holding pond discharge to cause or contribute to an exceedance of the bacteria WLAs and obviates the need for WQBELs for bacteria applied at the point of discharge to the receiving water. All effluent monitoring data and any information to support a RPA must be submitted to the Regional Water Board with the entity's application for permit renewal, which is due at least 180 days prior to the expiration of the NPDES permit. If an entity opts not to characterize the waste discharge from the holding pond to surface water, the effluent discharge will be deemed to have reasonable potential to exceed the bacteria water quality objective and the WLAs.

Based on the information provided by the NPDES entity with the application for permit renewal, the Regional Water Board will complete the RPA and establish appropriate WQBELs, if necessary, in the entity's NPDES permit at the first renewal after the effective date of the Action Plan. The NPDES entity should consult with Regional Water Board NPDES permitting staff regarding the scope and adequacy of any investigation or special study to determine the presence of human pathogens in a discharge from a holding pond to surface waters prior to initiating the study.

Based on an entity's request and demonstration that it is infeasible for the entity to achieve immediate compliance with adopted WQBELs, the Regional Water Board may authorize a schedule of compliance in the NPDES permit. A schedule of compliance shall include a series of required actions to be undertaken by the discharger for the purpose of achieving adopted WQBELs. These actions shall demonstrate reasonable progress toward the attainment of WQBELs. The compliance schedule shall reflect a realistic assessment of the shortest practicable time to perform each task. The compliance schedule shall contain a final compliance date based on the shortest practicable time required to achieve compliance, but in no case exceed ten years from the effective date of the adopted NPDES permit. The deadlines for each action in the compliance schedule shall be specified in the NPDES permit and may be accompanied by interim

requirements, such as, interim WQBELs and pollutant minimization measures. If the final compliance date extends beyond the term of the NPDES permit, the final compliance date and supporting explanation shall be included in the permit."

47. Section 9.2.7.3 (Geographic Area of the APMP), page 9-11. Revise the third paragraph to read "Accordingly, the Action Plan defines the Russian River Watershed APMP boundary[26] to include both: 1) parcels that are at least partially within 600 linear feet in the horizontal (map) direction on either side of the entire centerline of blueline streams depicted on the USGS 1:100,000 scale topographic map for impaired HUC-12 sub-watersheds, and 2) parcels that are at least partially within 200 linear feet on either side of the centerline of any waterway derived using LIDAR datasets in HUC-12 sub-watersheds that have evidence of pollution attributable to fecal waste discharges. Affected HUC-12 sub-watersheds include the following: Brooks Creek (Russian River), Dutch Bill Creek (Russian River), Green Valley Creek, Lower Laguna de Santa Rosa, Upper Laguna de Santa Rosa, Lower Santa Rosa Creek, Porter Creek (Russian River), West Slough (Dry Creek), Upper Laguna de Santa Rosa, Upper Santa Rosa Creek, and Willow Creek (Russian River)."
48. Section 9.2.7.4 (Operation and Maintenance Requirements), page 9-12. Add the following text as a footnote to the term "qualified professional" in the first sentence of the second paragraph: "A qualified professional means an individual licensed or certified by a State of California agency to design OWTS and practice as professionals for other associated reports, as allowed under their license or registration. Depending on the work to be performed and various licensing and registration requirements, this may include an individual who possesses a registered environmental health specialist certificate or is currently licensed as a professional engineer or professional geologist. For the purposes of performing site evaluations, Soil Scientists certified by the Soil Science Society of America are considered qualified professionals. A local agency may modify this definition as part of its Local Agency Management Program."
49. Section 9.2.7.4 (Operation and Maintenance Requirements), page 9-13. Add a new section following section b that reads:

    "c. Final Inspection Report
        1. Name and certification of the qualified professional conducting the inspection
        2. Date of the inspection
        3. Narrative description of the work conducted
        4. Inspection results and observations
        5. Interpretation of results and recommendations for corrective actions, if needed
        6. Supporting documents"

50. Section 9.2.7.4 (Operation and Maintenance Requirements), page 9-13. After the final sentence in section 9.2.7.4 add the following sentence: "For existing OWTS that have been deemed adequately functional by the local agency and whose owners have initiated corrective action with the local agency for a replacement OWTS, the minimum requirements for a basic operational inspection may be reduced or modified until the replacement OWTS is operational."
51. Section 9.2.7.5 (Corrective Action Requirements), page 9-13. Add to the second paragraph, following the third sentence, the following sentence: "In accordance with an approved LAMP,

the local agency may approve OWTS repairs in substantial conformance with the OWTS Policy and the APMP on a case-by-case basis when it has been determined that an OWTS requiring corrective action is unable to comply with corrective actions and where an OWTS owner has demonstrated financial hardship, funding assistance is not available, and reasonable compliance alternatives are unavailable, and/or other criteria established in an approved LAMP."

52. Section 9.2.7.5 (Corrective Action Requirements), page 9-15. Add a new section following section b.iv that reads: "v. When the OWTS is less than 200 feet from the top of the bank of any waterbody within the APMP boundary and the parcel is included in the APMP solely as a result of the parcel's distance from a water body derived from the Sonoma County LIDAR dataset, except when the replacement OWTS meets the conditions in Table 3 for OWTS"
53. Section 9.2.11 (Municipal Storm Water Runoff), page 9-21. Delete from the first paragraph the text "(excluding the Sonoma County Water Agency, who does not have land use authority)."

Chapter 10 – Watershed Monitoring

54. Section 10.3 (Russian River Monitoring Program), page 10-2. Following the second sentence of the last paragraph, add: "Participation in the R3MP may in some cases satisfy requirements for certain monitoring actions required of individual responsible parties."
55. Section 10.7 (Special Studies), page 10-6. Revise section to read "The Russian River Estuary may close throughout the year as a result of a barrier beach (closed sandbar) forming across the mouth of the Russian River at Goat Rock State Beach. Such closures usually occur during the spring, summer, and fall. Closures result in ponding of the Russian River behind the barrier beach creating lagoon conditions and, as water surface levels rise in the Estuary, flooding may occur. The barrier beach has been artificially breached by various parties for decades, mostly recently by Sonoma County Water Agency (Sonoma Water) for the purpose of alleviating potential flooding of low-lying properties along the Estuary. However, the National Marine Fisheries Service's (NMFS) Russian River Biological Opinion has concluded that the freshwater lagoon conditions that form behind the sand bar from May 15 to October 15 are beneficial to the growth of young steelhead and should be preserved, as possible. In order to comply with the requirements of the Russian River Biological Opinion, the Sonoma Water implements the Russian River Estuary Management Project (Estuary Project), which adaptively manages the Estuary with the dual objectives of enhancing rearing habitat for juvenile salmonids, particularly steelhead, and managing Estuary water levels to minimize flood hazard. From May 15 to October 15 ("lagoon management period"), a barrier beach/river mouth closure is managed to reduce tidal influence and to increase freshwater habitat available for salmon and steelhead, while minimizing flood risk and, avoiding historic artificial breaching practices. Artificial breaching outside of the lagoon management period is implemented consistent with historical practices. Water quality monitoring during the lagoon management period includes weekly grab sampling at multiple locations for pathogens, including total coliforms, E. coli and enterococcus. The TMDL analyses did not specifically include assessment of the degree to which the presence of the sand bar and freshwater lagoon at the mouth of the river affect upstream ambient water quality conditions. But, the Estuary Project's Environmental Impact Report concluded that there is a large variation in indicator bacteria levels observed through the different sections of the Estuary, that these variations were observed to occur under both open and closed mouth conditions and may be seasonal as well, and that there might be water quality impacts that are

not mitigatable. Further assessment of the effects of these phenomena on water quality conditions and implementation of the pathogen TMDL is warranted."

Chapter 11 – CEQA Substitute Environmental Analysis

56. No revisions.

Chapter 12 – Economic Considerations

57. Section 12.2.1.2 (Expansion of Collection, Treatment, and Disposal or Recycled Water Systems), page 12-6. Revise the first paragraph of the section, seventh sentence to read "In Sonoma County, the Sonoma County Water Agency (Sonoma Water) is developing a project for Larkfield Estates that would extend and make sewer service available to property owners that were impacted by a destructive wildfire in 2017. The affected parcels are located within an existing municipal sewer boundary but are currently served by individual OWTS. Sonoma Water estimated that construction costs for the sewer connections, including service laterals to the property line, will cost between $50,000 to $55,000 per parcel."
58. Section 12.2.1.2 (Expansion of Collection, Treatment, and Disposal or Recycled Water Systems), page 12-6. Revise the second paragraph, last sentence to read "More recently, the Sonoma Valley County Sanitation District (Sonoma, CA) is proposing to constructed a 37-million gallon recycled water storage reservoir to increase recycled water, reduce its discharge to Schell Slough and San Pablo Bay, and provide recycled water for irrigation purposes."
59. Section 12.2.3 (Potential Costs for Individual and Decentralized Onsite Wastewater Treatment Systems), page12-7. Following the final paragraph in section 12.2.3.1, add the following new section 12.2.3.2:

    "12.2.3.2 COMMUNITY COST CONSIDERATIONS

    The County of Sonoma conducted a cost analysis to assess the impact of potential OWTS upgrades and replacements that could be expected as a result of Action Plan implementation. The County estimates that 2,100 County residents within the proposed geographic area of the Advanced Protection Management Plan (APMP) will require upgrades to their OWTS and another 1,400 residents will need to construct a new replacement OWTS to comply with the proposed APMP. The cumulative costs to affected OWTS owners is estimated by the County to be between $31.5 million and $42 million for OWTS owners who must upgrade and between $49 million and $70 million for construction of new replacement OWTS. The County also estimates a cumulative cost between $870,000 and $1.74 million for the 8,700 County residents now required by the APMP to inspect their OWTS once every five years. The County estimates that the total cumulative cost of implementing the APMP to County residents affected by the APMP is between $81 million and $114 million."

Chapter 13—Antidegradation Analysis

60. No revisions.

Chapter 14—Public Participation Summary

61. No revisions.

Chapter 15—Nine Key Elements

62. No revisions.

Chapter 16—References

63. Update references to include “Dubinsky, Eric. Personal communication, July 1. 2019.