



CENTRAL VALLEY REGIONAL
WATER QUALITY CONTROL BOARD

MUNICIPAL AND DOMESTIC
WATER SUPPLY (MUN)
BENEFICIAL USES IN
AGRICULTURAL DRAINS

Staff Report

May 2011



CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY



STATE OF CALIFORNIA

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EXECUTIVE SUMMARY

Water bodies in the Sacramento River and San Joaquin River Basins are designated with a municipal and domestic supply (MUN) beneficial use through one of three ways: (1) the water body has a MUN designation in Table II-1 of the *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Basin Plan); (2) the water body is not listed in Table II-1 but is a tributary to a water body with a MUN designation in Table II-1; or (3) the water body is not listed in Table II-1 and is designated MUN through the Central Valley Water Board's application of the State Water Board Resolution 88-63 (Sources of Drinking Water Policy). Water bodies designated with the MUN beneficial use must be protected with water quality objectives and water quality criteria meant to protect human health unless the MUN designation is removed through a basin plan amendment.

Several National Pollutant Discharge Elimination System (NPDES) permits for municipal discharges to receiving waters that were characterized as agricultural drains did not include effluent limitations to protect the MUN beneficial use. While the receiving waters might qualify for MUN de-designation, the basin plan has not been amended to remove the MUN beneficial use. Until the basin plan is amended, the MUN beneficial use must be protected. During recent permit renewals, this error is being rectified and requirements to protect MUN are being included. However, some of these dischargers have since upgraded the facilities to provide tertiary treatment. After these upgrades, the facilities cannot meet all the effluent limitations to protect the MUN beneficial use. The constituents of concern are nitrate, arsenic, trihalomethanes (THMs), aluminum, iron, manganese, and methylene blue active substances (MBAS).

This staff report presents some approaches to this situation. Permitting approaches are provided as the most efficient method but beneficial uses and water quality objectives cannot be modified using a permitting process. Basin planning approaches include beneficial use modification, revision of water quality objectives, or development of an implementation program to provide an alternative method to determining reasonable potential and/or deriving water quality based effluent limitations. It should be noted that removing the MUN beneficial use will affect a larger list of constituents than just the constituents of concern. A benefit of establishing water quality objectives rather than removing a use is that only the constituents of concern would be affected by the basin plan amendment.

In most cases, it is not clear that adequate data has been collected to go forward with any of the approaches. The type of data that needs to be collected are: characterization of the receiving waters, water quality data for the effluent and all receiving waters, flow data for all of the receiving waters, an antidegradation analysis, and an environmental analysis.

INTRODUCTION

Stakeholders and the Central Valley Regional Water Quality Control Board (Central Valley Water Board) have expressed concerns with the municipal and domestic supply (MUN) beneficial use designation of certain categories of water bodies. These categories include “agricultural drains,” “agricultural dominated water bodies,” and “effluent dominated water bodies.” Water bodies with a MUN beneficial use designation must be protected as a drinking water supply and are expected to meet water quality objectives and water quality criteria meant to protect human health. See Appendix A for lists of applicable water quality objectives and water quality criteria. This issue has recently surfaced for publicly owned treatment works (POTWs) that discharge to water bodies that are described as “agricultural drains.” For these POTWs, the constituents of concern based on the MUN beneficial use protection of the receiving waters appear to be nitrate, arsenic, trihalomethanes (THMs), aluminum, iron, manganese, and methylene blue active substances (MBAS). See Appendix B for a brief description of these constituents of concern.

Assigning MUN to Water Bodies

The Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Sacramento/San Joaquin Rivers Basin Plan) and the Water Quality Control Plan for the Tulare Lake Basin (Tulare Lake Basin Plan) designates beneficial uses to surface waters in three different ways: (1) Table II-1 lists existing and potential beneficial uses that apply to surface waters of the basins; (2) the beneficial uses of any specifically listed water body generally apply to its tributary streams; and (3) the Basin Plan implements the State Water Resources Control Board (State Water Board) Resolution 88-63 (“Sources of Drinking Water Policy”) by assigning municipal and domestic supply uses (MUN) to all unlisted water bodies. The main difference between the two Basin Plans is that the Tulare Lake Basin Plan includes groupings¹ of water bodies in Table II-1. Water bodies within the groups are considered named in Table II-1 and are not subject to the tributary statement and are not unlisted water bodies subject to MUN designation through the implementation of Resolution 88-63.

The City of Vacaville’s Easterly Wastewater Treatment Plant discharges to a natural water course that had been highly modified so that the only water it contains is wastewater, agricultural runoff, and local storm water runoff. The City of Vacaville and Central Valley Water Board staff agreed that protection of MUN made no sense, but staff believed that the Basin Plan did assign the MUN beneficial use to the water body and the National Pollutant Discharge Elimination System (NPDES) Permit must be written to protect MUN. In 2001, the Central Valley Water Board members reluctantly followed the staff recommendation. (R5-2001-0044) The permit was petitioned to the State Water Board. In Order WQO No. 2002-0015 (Vacaville Order), the State Water Board found that the

¹ Table II-1 of the Tulare Lake Basin Plan includes the following groups of water bodies: (1) Other East Side Streams, (2) Valley Floor Waters, and (3) West Side Streams.

Central Valley Water Board correctly concluded the Sacramento/San Joaquin Rivers Basin Plan provisions implementing Resolution 88-63 (the Sources of Drinking Water Policy) assigned MUN to the receiving water for Vacaville's wastewater treatment plant. The State Water Board also found that the Central Valley Water Board correctly determined that a basin plan amendment is required to de-designate MUN. The State Water Board did rule that the compliance schedule could recognize the option of conducting a Basin Planning process, and not require immediate construction of new treatment facilities. Also in the Vacaville Order, the State Water Board addressed the issue of whether the exception provisions of Resolution 88-63 could be applied without amending the Basin Plan. The State Water Board noted that it had anticipated that the Regional Boards would apply the exception criteria through basin plan amendments designating beneficial uses other than MUN to specific water bodies as appropriate. (Vacaville Order, page 27) Because the Central Valley Water Board implemented Resolution 88-63 through a blanket MUN designation for all unidentified water bodies in the Region, it is now required to go through another rulemaking process to change the designation.

Therefore, the Central Valley Water Board must assign MUN to the water bodies that are not listed in Table II-1 unless the water body meets the exemption criteria in Resolution 88-63 and the Basin Plan is amended to de-designate the MUN beneficial use for that water body. Since the State Water Board wrote the Sources of Drinking Water Policy, it is always possible for the Regional Water Board to recommend that the State Water Board grant an exception that is not already included in the Policy. It should be recognized that this is a much less sure path than using an exception that is already in the Policy.

PROBLEM STATEMENT

This issue paper will focus on the cases where the addition of the MUN beneficial use protection to the receiving waters is causing imposition of effluent limits that the discharger cannot immediately comply with. There are situations where NPDES permits have included the MUN beneficial use for receiving waters characterized as agricultural waters or effluent dominated waters but the MUN beneficial use did not result in the need for effluent limits which the discharger was in immediate noncompliance with.² There are also situations where NPDES permits have included the MUN beneficial use for receiving waters, the

² Facilities with receiving waters, characterized as agricultural drains, effluent dominated water bodies, or agricultural canals, designated for protecting MUN beneficial use but have no constituents of concern due to the MUN designation:

- (1) California Dairies, Inc, Tipton Milk & Butter Processing Facility, R5-2008-0114 (CA0082805)
- (2) The Vendo Co Groundwater Remediation System, R5-2006-0016 (CA0083046)
- (3) General Electric Co and Wellmade Products Co, Groundwater Cleanup System, R5-2009-0061 (CA0081833)
- (4) Rockwell Automation, Inc, and Porterville Unified School District, Groundwater Cleanup System, R5-2011-0013 (CA0082708)

discharger was not in immediate compliance with the water quality based effluent limits, but the discharger has since upgraded and is now in compliance³.

The current issue is the situation where NPDES permits have been previously adopted for municipal dischargers that did not provide protection for MUN in the receiving waters when MUN is a designated beneficial use. In most of these cases, the MUN beneficial use was not protected in the receiving water because the receiving water was characterized as an “agricultural drain” and the first downstream water body listed in Table II-1 of the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins (Basin Plan) does not have a MUN designation so the MUN beneficial use did not apply via the tributary statement. However, this omission of the MUN beneficial use is an error because the receiving water should be protected for the MUN beneficial use in accordance with the Central Valley Water Board’s implementation of Resolution 88-63 which applied the MUN beneficial use to all water bodies which are not listed in Table II-1.

During recent permit renewals, this error is being rectified and requirements to protect MUN are being included. The correction in the beneficial uses of the receiving waters is causing the inclusion of requirements for facilities to perform expensive upgrades to meet these new requirements.

Additionally, the Central Valley Water Board is questioning whether MUN is an appropriate designation for receiving waters characterized as “agricultural drains” that are tributary to water bodies which do not have MUN designated.

The list of affected facilities is as follows:

- Live Oak WWTP, R5-2004-0096 (CA0079022), permit renewal hearing held in February 2011, hearing continued to June 2011.
- City of Willows, R5-2006-0009 (CA0078034), permit renewal to be considered in June 2011
- City of Colusa WWTP, R5-2008-0184 (CA0078999)
- City of Biggs, R5-2007-0032 (CA0078930)
- City of Davis, R5-2007-0132-02 as amended by R5-2010-0097 (CA0079049)

The immediate receiving waters for each of these dischargers, which are all POTWs, are not water bodies listed in Table II-1 of the Basin Plan so the assigned beneficial uses are based on the tributary statement which is that “[t]he beneficial uses of any specifically identified water body [i.e. water bodies listed in Table II-1] generally apply to its tributary streams.” In this case, the downstream

³ Facilities with receiving waters, characterized as agricultural drains, effluent dominated water bodies, or agricultural canals, designated for protecting MUN beneficial use that were in violation of effluent limits designed to protect MUN but have since constructed upgrades and are now in compliance:

(1) Malaga County Water District WWTF, R5-2008-0033 (CA0084239)

water body is not designated with the MUN beneficial use. However, the Central Valley Water Board implements the State Water Board's Sources of Drinking Water Policy by assigning MUN to water bodies which are not listed in Table II-1. The Central Valley Water Board may make exceptions to this designation in accordance with the criteria in the Sources of Drinking Water Policy. Criterion 2.b. of that Policy allows exceptions for surface waters where "[t]he water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Boards."

The previous permit for Colusa and the current permits for Live Oak, Willows, Biggs and Davis do not recognize that MUN is a beneficial use of the receiving waters. Each of these permits has findings that the receiving waters for each of these discharges are agricultural drains. However, in the case of Biggs, the Central Valley Water Board recognized that the MUN beneficial use needed to be removed through a basin plan amendment so a compliance schedule was included to allow the discharger to develop and complete a work plan to have the MUN beneficial use removed.

While the situation of assigning the MUN beneficial use to water bodies that are considered effluent dominated or agricultural dominated occurs throughout the Region, the pressing regulatory issue is occurring in the Sacramento River and San Joaquin River Basins. Therefore, the remainder of this discussion will focus on the Sacramento/San Joaquin River Basins Plan (Basin Plan).

Other discharges were identified with issues similar to the situation described above but are constructing upgrades to meet the requirements in the NPDES permits. These dischargers are beyond the point when they can benefit from any of the possible approaches discussed in this paper:

The City of Williams (R5-2008-0185-01 as amended by R5-2009-0075 (CA0077933)) discharges to a creek that is eventually tributary to the Colusa Basin Drain, which does not have the MUN beneficial use designated. Due to the implementation of Resolution 88-63, the receiving waters, which are not listed in Table II-1 of the Basin Plan, have been assigned the MUN beneficial use. In order to meet the effluent limits derived to protect the MUN beneficial use, the City has been upgrading the treatment plant and the upgraded plant is expected to be fully operational by the end of June 2011.

The Malaga County Water District WWTF (R5-2008-0033 (CA0084239)) is located in the Tulare Lake Basin and discharges to an agricultural supply channel. The District has recently replaced the disinfection system to meet effluent limits associated with protecting the MUN beneficial use.

Issues

In the NPDES permits for the affected facilities, the immediate receiving waters were characterized as “constructed agricultural drains.” However, it is questionable if some of these water bodies are agricultural drains that meet the description in Criterion 2.b. of Resolution 88-63. Criterion 2.b. allows exceptions from a MUN designation for water in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters. However, the findings in the permits indicate that the receiving water characterized as an “agricultural drain” is also used for irrigation supply deliveries. This is not just a semantics issue of “agricultural drain” versus “supply canal.” Supply canals can be used to transport water for domestic and municipal use in addition to providing transport of agricultural drainage. A channel that provides both drainage and water supply may not qualify for the Sources of Drinking Water Policy exception, and should be examined more carefully than a channel only providing drainage to assure that it is appropriate to remove the MUN beneficial use.

The exception criterion also requires that the discharge from these water systems be monitored to assure compliance with all relevant water quality objectives. The permits contain no findings on whether the discharges from these water bodies are monitored to assure compliance with all relevant water quality objectives.

So, using the findings from the permits, it is not clear that the Central Valley Water Board can consider an exception from the MUN designation in accordance with the Sources of Drinking Water Policy.

This paper only analyzes the findings from the NPDES permits. The Central Valley Water Board is in possession of other information that may assist in establishing the character of the receiving waters. If the Board decides to go forward with a basin plan amendment, other available information will be analyzed and additional information may be requested from parties other than the NPDES dischargers to establish the character of the receiving waters.

To protect the MUN beneficial use, water quality objectives and California Toxics Rule (CTR) criteria that protect human health must be met. The constituents of concern based on the MUN beneficial use protection of the receiving waters for these dischargers appear to be nitrate, arsenic, THMs, aluminum, iron, manganese, and MBAS. Three of the affected POTWs (Live Oak, Colusa and Willows) are constructing tertiary treatment facilities to comply with previous permit requirements that were not aimed at meeting effluent limits designed to protect the MUN beneficial use. The tertiary facilities for these municipalities that have been constructed may not address the constituents of concern. The City of Davis' Order requires that the City upgrade its existing secondary facility to a new tertiary facility.

PERMITTING APPROACHES

The most efficient method of addressing the Central Valley Water Board's concerns would be the permitting process. The Central Valley Water Board cannot modify beneficial uses nor water quality objectives using a permitting process but there are a few permitting strategies that could provide relief.

The City of Davis discharges to the Willow Slough Bypass and to the Conaway Ranch Toe Drain. Both receiving waters are characterized as tributary to the Yolo Bypass. Actually, the Conaway Ranch Toe Drain is in the Yolo Bypass and the Yolo Bypass does not have a MUN designation. The Conaway Ranch Toe Drain runs on the west side of the Yolo Bypass inside the West Bypass Levee. If the City of Davis discharged entirely into the Conaway Ranch Toe Drain and the this water body is characterized as being part of the Yolo Bypass, then MUN would not apply to the Conaway Ranch Toe Drain.

In reviewing the Fact Sheets for Live Oak and Colusa, it appears that the receiving water already contains elevated levels of some of the constituents of concern. In this case, the SIP requires using the water quality objective or the applicable water quality criteria as the average monthly effluent limit. However, the SIP only applies to the priority pollutants. For non-priority pollutants, the Central Valley Water Board may use different procedures as long as the Board is consistent. The Basin Plan contains a policy called "Application of Water Quality Objectives" which states that "the water quality objectives do not require improvement over naturally occurring background concentrations. In cases where the natural background concentration of a particular constituent exceeds and applicable water quality objectives, the natural background concentration will be considered to comply with the objective." Since this policy states that it is not the Board's intent to require improvement over natural background concentrations, in cases where the receiving water already contains elevated levels of a constituent, the elevated levels could be used as the effluent limit. This policy interpretation could be used for non-priority pollutants such as iron, manganese and aluminum. However, the permit would need to include findings that the receiving water conditions could be construed to be the natural background concentrations.

The Central Valley Water Board has a policy to encourage reclamation and reuse. Municipal wastewaters must be considered as a potential integral part of the total available fresh water resource. Therefore, the Central Valley Water Board could include more stringent requirements for these dischargers to evaluate land disposal options, particularly reclamation and reuse. If the dischargers no longer discharge to surface waters, the issue becomes moot.

BASIN PLANNING APPROACHES

Basin Plan Amendments follow a structured process that is considered very time consuming. Amendments involve a certain level of public participation and environmental review. It takes roughly 1.5 PYs (experienced staff person) spread over a two to three year time frame to process a Basin Plan Amendment after all the technical work of justifying the amendment is complete. The types of Basin Plan Amendments that could address this situation are beneficial use modification, revision of water quality objectives, or development of an implementation program to provide an alternative method to determining reasonable potential and/or deriving water quality based effluent limitations. It might be necessary to amend the Basin Plan in all three areas to develop a policy that provides appropriate water quality protection.

It should be noted that the Basin Plan is the Central Valley Water Board's policies for how to protect water quality for its beneficial uses. While alternative interpretation of the Basin Plan or errors in the Basin Plan can lead to excessively stringent regulation of dischargers, the Basin Plan is not meant to provide the means to release dischargers from their water quality obligations.

Beneficial Uses

The beneficial use that is causing concern in this case is MUN. Removal of the MUN beneficial use is allowed after meeting state and federal regulations applicable to removal of this use. The State Water Board's Resolution No. 88-63 (Sources of Drinking Water Policy) describes the criteria that the Regional Water Board must consider in order to remove the MUN beneficial use. USEPA approval of the beneficial use modification is required for waters of the United States. Federal regulations allow States to remove a designated use which is not an existing use if one of the factors in 40 CFR 131.10(g) are met. The federal regulations define existing use as the use actually occurring or the water quality to support the use has occurred since 28 November 1975.

The Regional Water Board must follow these steps to remove MUN from a surface water body that is a water of the United States. If the surface water body is determined not to be a water of the United States, then only step 1 is needed.

1. Establish which of the exception criteria in the Sources of Drinking Water Policy is met for each water body under consideration.
2. Establish that the MUN beneficial use is not "existing" as defined in 40 CFR §131.3(e). Existing uses are defined as uses that were attained on or after 28 November 1975. An existing use is attained if the use has actually occurred or the water quality necessary to support the use has been achieved, even if the use itself is not currently established, unless physical factors prevent attainment of the use. (USEPA 1994)
3. Establish that attaining MUN is not feasible due to one or more of the factors listed in 40 CFR §131.10(g).

The Central Valley Water Board successfully completed the above steps for Sulphur Creek in Colusa County. The Central Valley Water Board also removed the MUN beneficial use for Old Alamo Creek in Solano County; however Old Alamo Creek was given an exception from step 1, above, in the Vacaville Order.

Appendix C is a summary of the Basin Plan Amendment process for removing the MUN beneficial use.

In many cases, the Central Valley Water Board may believe that a water body is not suitable for the full range of MUN beneficial use but cannot meet the above steps. In some of these cases, the Central Valley Water Board might consider sub-categorizing the MUN beneficial which would allow the Central Valley Water Board to establish less stringent water quality objectives to protect the sub-categorized use. Sub-categorization of the use would entail identifying the elements of municipal and domestic supply that are appropriate for the specific water body. For example the Central Valley Water Board might determine that the appropriate use is municipal or domestic supply after standard water treatment processes. Sub-categorization might be a possible approach to address priority pollutants, such as arsenic, where the background concentrations are naturally elevated and could allow the Central Valley Water Board to consider site-specific water quality objectives for arsenic. In this example, since the water is still a source of drinking water, it is consistent with the Sources of Drinking Water Policy and no exceptions need to be applied. However, since the applicable water quality criteria will be less stringent, the structured scientific analysis required by federal regulations will still be required. Other approaches that fall under sub-categorization is removing MUN protection for part of the year or recognizing that the municipal and domestic use does not include consumption of the water. Sub-categorizing the MUN beneficial use has not been done in California.

Water Quality Objectives

The Central Valley Water Board could consider developing site-specific water quality objectives (SSOs) for the constituents of concern, which are nitrate, arsenic, THMs, aluminum, iron, manganese, and MBAS. One of the primary benefits of establishing SSOs rather than removing a use is that only the constituents of concern are affected by the basin plan amendment. Concentrations of other constituents will continue to be protected at the current levels of protection. The situation for each of these constituents of concern is different so the approach for SSOs could be different depending on the constituent.

At these facilities, the water quality in the receiving water upstream of the discharge contained elevated levels of arsenic, aluminum, iron and manganese. The applicable water quality objectives for aluminum, iron and manganese are secondary drinking water standards which are non-mandatory standards that do not have human health effects at these levels but have aesthetic concerns. The aesthetic concern with aluminum, iron and manganese is that they produce a

colored appearance and a metallic taste in water. Since these constituents do not have human health effect at these levels, it might be justified to establish SSOs that are at a higher concentration than the concentrations protected at the secondary MCL. The effect of the constituents at higher levels on other beneficial uses must also be determined when developing SSOs. If the elevated levels found in the background do not adversely affect any of the beneficial uses, the Central Valley Water Board could consider using the background water quality as the SSOs.

The approach for MBAS would be different. The applicable water quality objective for this constituent is the secondary drinking water standards. However, unlike the case of aluminum, iron and manganese, the water quality in the receiving water upstream of the discharge does not contain elevated levels of MBAS. In addition, foaming could adversely affect other beneficial uses such as aquatic life. These effects would need to be evaluated to develop appropriate SSOs.

The approach for nitrate and arsenic would also be different because the applicable water quality objectives for these constituents are the primary drinking water standards which are designed to protect public health. Without modifying the MUN use, it would be uncertain if a higher level for these constituents could be justified. In addition, the effect of nitrate and arsenic on other beneficial uses, such as stock watering, might be of concern and would need to be evaluated.

Finally, the approach for THMs will be different than the other constituents. THMs are priority pollutants subject to the SIP. However, THMs are carcinogens protected at the 10^{-6} risk level, which is the risk of up to one additional cancer in one million people based on a certain fish and water consumption level and a certain number of years. Similar to the Basin Plan Amendment for SSOs for New Alamo and Ulatis Creeks, the Board can determine that due to a lack of potential lifetime use of the water body for drinking water, a higher level of THMs will still protect the MUN beneficial use.

Implementation Program

The Central Valley Water Board could consider developing an implementation program to specify procedures for determining reasonable potential and, if there is a need, calculating the effluent limitations.

The *Policy for Implementation of Toxics Standards for Inland Waters, Enclosed Bays, and Estuaries of California* (i.e. State Implementation Plan or SIP) has procedures for determining whether there is a need for water quality-based effluent limitations and for calculating the effluent limitations for priority pollutants. Of the constituents of concern, only arsenic is a priority pollutant. For non-priority pollutants, there is no established policy for determining reasonable potential or calculating effluent limits. In Water Quality Orders (e.g. WQO 2010-0005, page 5; and WQO 2004-0013, page 6), the State Water Board has stated that the Regional Water Boards are not restricted to one particular method for

determining reasonable potential for pollutants other than priority pollutants. Instead, the Regional Water Boards can use procedures described in USEPA Technical Support Document (USEPA. 1991), the SIP procedures as guidance, or any other appropriate methodology. At a minimum, however, the Regional Water Boards must clarify the methodology that is used and use the methodology consistently.

The Central Valley Water Board could adopt an implementation program into the Basin Plan to establish procedures for determining reasonable potential and calculating effluent limits for non-priority pollutants in the situation where background water quality already exceeds the water quality objectives. In the case of priority pollutants, the SIP requires imposition of the water quality criteria as the effluent limit if the background water quality exceeds the applicable criteria.

In some of these cases, the first receiving water might meet the state and federal factors to remove the MUN beneficial use but subsequent water bodies might not meet the factors. The SIP does not have specific procedures for determining reasonable potential and calculating effluent limits for the case where a beneficial use is applicable to a downstream water body but not the first water body. In that case, the Central Valley Water Board would be justified in creating special procedures. In some of these cases, it may be found that the constituents of concern meet the water quality objectives in these downstream water bodies. In that case, it could be reasonable to establish procedures that recognize this situation.

The Central Valley Water Board used this exact argument to develop site-specific implementation procedures for dischargers to Old Alamo Creek. Old Alamo Creek is not designated MUN but downstream water bodies are designated MUN.

INFORMATION NEEDS

It is not clear if adequate data has been collected to go forward with any of these approaches. The following constitutes the minimum information needed to determine which approach(es) are feasible:

- The receiving waters need to be adequately characterized to explain the history, purpose and management of each of these water bodies. At a minimum, the characterization of the receiving waters should explain why it was constructed/modified, by whom and when. If this characterization demonstrates that the water body meets Criteria 2.a. or 2.b. in the Sources of Drinking Water Policy, and the Central Valley Water Board decides to go forward with a basin plan amendment, then the references for the characterization are necessary for the administrative record.

- Water quality data is needed for the effluent and all of the receiving waters to the water body that is named in Table II-1 of the Basin Plan. At a minimum, samples should be collected monthly for a year and analyzed for TDS, EC and the constituents of concern which appear to be nitrate, arsenic, manganese, iron, and aluminum. Sample locations in the receiving water should be upstream and downstream of the discharge. In subsequent receiving waters, sample locations should be upstream and downstream of the confluence.
- Flow data is needed for each of the receiving waters.
- Antidegradation Analysis – To complete the antidegradation analysis, the expected water quality conditions after implementation of any basin plan amendments need to be compared to the best water quality conditions since 1968 and 1974 to be consistent with the State Antidegradation Policy (State Water Board Resolution No. 68-16) and the federal antidegradation policy (40 CFR §131.12). Any degradation in water quality could only be allowed after establishing that the change is consistent with the federal and State policies.
- Environmental Analysis – Significant environmental impacts resulting from implementation of any basin plan amendments need to be identified. Then any alternatives and mitigation measures will need to be identified and incorporated into the project if feasible.

LITERATURE CITED

USEPA. 1991. Technical Support Document for Water Quality-Based Toxics Control. Office of Water, Washington, D.C. EPA-505-2-90-001. pp 47-66 and 93-121

USEPA. 1994. Water Quality Standards Handbook: Second Edition, Section 2.7. Office of Water, Washington, DC. EPA-823-B-94-005b.

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APPENDIX A

Water Quality Objectives

The Basin Plan has several water quality objectives that refer to the maximum contaminant levels (MCLs). There are MCLs for the following chemicals and radionuclides:

Inorganic Chemicals

Aluminum
Antimony
Arsenic
Asbestos
Barium
Beryllium
Cadmium
Chromium
Cyanide
Fluoride
Mercury
Nickel
Nitrate (as NO₃)
Nitrate+Nitrite (sum as nitrogen)
Nitrite (as nitrogen)
Perchlorate
Selenium
Thallium

Radionuclides

Radium-226
Radium-228
Gross alpha particle activity
(excluding radon and uranium)
Uranium
Beta/photon emitters
Strontium-90
Tritium

Volatile Organic Chemicals (VOCs)

Benzene
Carbon Tetrachloride
1,2-Dichlorobenzene
1,4-Dichlorobenzene
1,1-Dichloroethane
1,2-Dichloroethane
1,1-Dichloroethylene
cis-1,2-Dichloroethylene
trans-1,2-Dichloroethylene
Dichloromethane
1,2-Dichloropropane
1,3-Dichloropropene
Ethylbenzene
Methyl-tert-butyl ether
Monochlorobenzene
Styrene
1,1,2,2-Tetrachloroethane
Tetrachloroethylene
Toluene
1,2,4-Trichlorobenzene
1,1,1-Trichloroethane
1,1,2-Trichloroethane
Trichloroethylene
Trichlorofluoromethane
1,1,2-Trichloro-1,2,2-Trifluoroethane
Vinyl Chloride
Xylenes

Non-Volatile Synthetic Organic
Chemicals (SOCs)

Alachlor
Atrazine
Bentazon
Benzo(a)pyrene
Carbofuran
Chlordane
2,4-D
Dalapon
Dibromochloropropane
Di(2-ethylhexyl)adipate
Di(2-ethylhexyl)phthalate
Dinoseb
Diquat
Endothall
Endrin
Ethylene Dibromide
Glyphosate
Heptachlor
Heptachlor Epoxide
Hexachlorobenzene
Hexachlorocyclopentadiene
Lindane
Methoxychlor
Molinate
Oxamyl
Pentachlorophenol
Picloram
Polychlorinated Biphenyls
Simazine
Thiobencarb
Toxaphene
2,3,7,8-TCDD (Dioxin)
2,4,5-TP (Silvex)

Secondary Maximum Contaminant
Levels

Aluminum
Color
Copper
Foaming Agents (MBAS)
Iron
Manganese
Methyl-tert-butyl ether (MTBE)
Odor-Threshold
Silver
Thiobencarb
Turbidity
Zinc
Total Dissolved Solids
Specific Conductance
Chloride
Sulfate

California Toxics Rule (CTR)

The CTR criteria for the protection of human health when consuming water and organisms apply to waters of the State with a MUN beneficial use designation. These criteria have been established for the following constituents:

Antimony	Tetrachloroethylene
Arsenic	Toluene 108883
Beryllium	1,2-Trans-Dichloroethylene
Cadmium	1,1,1-Trichloroethane
Chromium (III)	1,1,2-Trichloroethane
Chromium (VI)	Trichloroethylene
Copper	Vinyl Chloride
Lead	2-Chlorophenol
Mercury	2,4-Dichlorophenol
Nickel	2,4-Dimethylphenol
Selenium	2-Methyl-4,6-Dinitrophenol
Silver	2,4-Dinitrophenol
Thallium	2-Nitrophenol
Zinc	4-Nitrophenol
Cyanide	3-Methyl-4-Chlorophenol
Asbestos	Pentachlorophenol
2,3,7,8-TCDD (Dioxin)	Phenol
Acrolein	2,4,6-Trichlorophenol
Acrylonitrile	Acenaphthene
Benzene	Acenaphthylene
Bromoform	Anthracene
Carbon Tetrachloride	Benzidine
Chlorobenzene	Benzo(a) Anthracene
Chlorodibromomethane	Benzo(a) Pyrene
Chloroethane	Benzo(b) Fluoranthene
2-Chloroethylvinyl Ether	Benzo(ghi) Perylene
Chloroform	Benzo(k) Fluoranthene
Dichlorobromomethane	Bis(2-Chloroethoxy) Methane
1,1-Dichloroethane	Bis(2-Chloroethyl) Ether
1,2-Dichloroethane	Bis(2-Chloroisopropyl) Ether
1,1-Dichloroethylene	Bis(2-Ethylhexyl) Phthalate
1,2-Dichloropropane	4-Bromophenyl Phenyl Ether
1,3-Dichloropropylene	Butylbenzyl Phthalate
Ethylbenzene	2-Chloronaphthalene
Methyl Bromide	4-Chlorophenyl Phenyl Ether
Methyl Chloride	Chrysene
Methylene Chloride	Dibenzo(a,h)Anthracene
1,1,2,2-Tetrachloroethane	1,2-Dichlorobenzene

1,3-Dichlorobenzene
1,4-Dichlorobenzene
3,3'-Dichlorobenzidine
Diethyl Phthalate
Dimethyl Phthalate
Di-n-Butyl Phthalate
2,4-Dinitrotoluene
2,6-Dinitrotoluene
Di-n-Octyl Phthalate
1,2-Diphenylhydrazine
Fluoranthene
Fluorene
Hexachlorobenzene
Hexachlorobutadiene
Hexachlorocyclopentadiene
Hexachloroethane
Ideno(1,2,3-cd)Pyrene
Isophorone
Naphthalene
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodi-n-Propylamine
N-Nitrosodiphenylamine
Phenanthrene
Pyrene
1,2,4-Trichlorobenzene
Aldrin
alpha-BHC
beta-BHC
gamma-BHC
delta-BHC
Chlordane
4,4'-DDT
4,4'-DDE
4,4'-DDD
Dieldrin
alpha-Endosulfan
beta-Endosulfan
Endosulfan Sulfate
Endrin
Endrin Aldehyde
Heptachlor
Heptachlor Epoxide
Polychlorinated Biphenyls (PCBs)
Toxaphene

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APPENDIX B

Constituents of Concern

The constituents of concern based on the MUN beneficial use protection of the receiving waters appear to be aluminum, nitrate, trihalomethanes (THMs), arsenic, iron, manganese, and methylene blue active substances (MBAS). Effluent limits for NPDES dischargers are based on water quality objectives which impose the drinking water standards and the criteria promulgated in the California Toxics Rule (CTR).

Drinking water standards are Primacy Maximum Contaminant Levels (MCLs) or Secondary MCLs. Primary MCLs are enforceable drinking water standards which are established to protect the public against consumption of drinking water contaminants that present a risk to human health. Secondary MCLs are non-mandatory water quality standards established as guidelines to assist public water systems in managing their drinking water for aesthetic considerations, such as taste, color and odor. These contaminants are not considered to present a risk to human health at the Secondary MCL concentrations.⁴

Criteria in the CTR were derived to protect human health based on two types of toxicological endpoints: (1) carcinogenicity and (2) systemic toxicity.

Primary MCLs

Nitrate

The California Primary MCL is 10 mg/l for nitrate as nitrogen. The concern with nitrate is for infants below the age of six months who drink water containing nitrate in excess of the MCL could become seriously ill and, if untreated, may die. Symptoms include shortness of breath and blue-baby syndrome.⁵

Primary MCLs and CTR Constituents

Arsenic

The California Primary MCL is 0.01 mg/l. The concern with arsenic is skin damage or problems with circulatory systems, and may have increased risk of getting cancer.⁶ Arsenic is a priority pollutant covered by the CTR but no criteria to protect human health was promulgated.

⁴ United States Environmental Protection Agency, 2011. Secondary Drinking Water Regulations: Guidance for Nuisance Chemicals. This information is available at:
<http://water.epa.gov/drink/contaminants/secondarystandards.cfm>

⁵ United States Environmental Protection Agency, 2011. National Primary Drinking Water Regulations. List of Contaminants & their MCLs. This information is available at:
<http://water.epa.gov/drink/contaminants/>

⁶ United States Environmental Protection Agency, 2011. National Primary Drinking Water Regulations. List of Contaminants & their MCLs. This information is available at:
<http://water.epa.gov/drink/contaminants/>

Trihalomethanes (THMs)

THMs are made up of bromoform, chloroform, dibromochloromethane and dichlorobromomethane. THM compounds are formed in the wastewater during the disinfection process with chlorine. The California Primary MCL for total THMs is 80 µg/L. The CTR includes a criterion of 4.3 µg/L for bromoform, 0.41 µg/L for dibromochloromethane, and 0.56 µg/L for dichlorobromomethane for the protection of human health for waters from which both water and organisms are consumed. Chloroform is a priority pollutant covered by the CTR but no criteria to protect human health was promulgated. Bromoform, dibromochloromethane and dichlorobromomethane are carcinogens. The CTR criteria for these constituents protect at the 10⁻⁶ risk level, which is the risk of up to one additional cancer in one million people based on a certain fish and water consumption level and a certain number of years.

Secondary MCLs

Aluminum

The California Primary MCL is 1 mg/l. The concern with aluminum is chronic toxicity due to gastrointestinal effects.⁷ The California Secondary MCL is 0.2 mg/l. The Secondary MCL level protects against colored water. Effluent limitations that are causing compliance issues are based on the Secondary MCL.

Iron

The California Secondary MCL is 0.3 mg/l. The secondary MCL protects against colored water, staining and metallic taste.

Manganese

The California Secondary MCL is 0.05 mg/l. The secondary MCL protects against colored water and metallic taste.

Methylene Blue Active Substances (MBAS)

The California Secondary MCL is 0.5 mg/l. The secondary MCL protects against froth, cloudy water, bitter taste and odor.

⁷ Office of Environmental Health Hazard Assessment. Health Risk Information for Public Health Goal Exceedance Reports. This information is available at: <http://oehha.ca.gov/water/phg/pdf/nphr2.pdf>

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APPENDIX C

DE-DESIGNATING MUN (MUNICIPAL AND DOMESTIC SUPPLY) BENEFICIAL USE

Background on MUN Designations

The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins* (Basin Plan) specifies the beneficial uses that must be protected for the larger water bodies in these two basins. These beneficial uses are listed in Table II-1 of the Basin Plan. Water bodies which are not listed are assigned the beneficial uses of the water body to which they are tributary. In addition, the Basin Plan assigns MUN as a beneficial use for all water bodies that are not listed in Table II-1 in accordance with the State Water Board Resolution No. 88-63, Sources of Drinking Water Policy.

Once designated in the Basin Plan, MUN can be removed for specific water bodies by amending the Basin Plan in accordance with state and federal laws and regulations as described below.

Regulations that Apply to Beneficial Use Designation

State Regulations and Guidance-State Water Board Sources of Drinking Water Policy (Resolution 88-63)

State Water Board Resolution No. 88-63, commonly known as the Sources of Drinking Water Policy, establishes state policy that all waters are considered suitable or potentially suitable to support the MUN beneficial use, with certain exceptions.

The Basin Plan implements Resolution 88-63 by assigning MUN to all water bodies not listed in Table II-1. Exceptions to the MUN designation through Resolution 88-63 are allowed for surface and ground waters where:

- 1a) The total dissolved solids (TDS) exceeds 3,000 mg/L (5,000 μ S/cm EC) and is not reasonably expected by the Regional Board to supply a public water system, or
- 1b) There is contamination, either by natural processes or by human activities (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or
- 1c) The water source does not provide sufficient water to supply a single well capable of producing an average, sustained yield of 200 gallons per day.

Exceptions to the MUN designation are allowed for surface waters where:

- 2a) The water is in systems designed or modified to collect or treat municipal or industrial wastewaters, process waters, mining

wastewaters, or storm water runoff, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Board; or

- 2b) The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters, provided that the discharge from such systems is monitored to assure compliance with all relevant water quality objectives as required by the Regional Board.

Exceptions to the MUN designation are allowed for ground water where the aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 Code of Federal Regulations, section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided that these fluids do not constitute a hazardous waste under 40 CFR, section 261.3.

Resolution 88-63 addresses only designation of water as drinking water sources; it does not establish objectives for constituents that are protective of the designated MUN use.

Federal Regulations and Guidance

Water quality standards must be approved by the US Environmental Protection Agency before a state can use the standards for NPDES permits. Water quality standards consist of beneficial uses and the water quality objectives to protect the beneficial uses and the policies that affect the application and implementation of water quality standards. Federal regulations require the protection of designated uses of surface water bodies. Federal regulations establish special protections for CWA §101(a)(2) uses. CWA §101(a)(2) states that it is a national goal that wherever attainable, water quality should be sufficient “for the protection and propagation of fish, shellfish, and wildlife and provides for recreation in and on the water.” These uses are also referred to as “fishable/swimmable” uses. In order to de-designate, subcategorize, or not designate these uses, the state must support its demonstration of infeasibility with a use attainability analysis (40 CFR §131.10(j)). In this case, a use attainability analysis is not required for de-designating MUN (40 CFR 131.10(j)(1)).

Federal regulations allow removing a designated use which is not an existing use or establishing sub-categories of a use after demonstrating that attaining the use is not feasible due to one or more of the factors listed in 40 CFR §131.10(g):

- (1) Naturally occurring pollutant concentrations prevent the attainment of the use; or
- (2) Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent

discharges without violating State water conservation requirements to enable uses to be met; or

- (3) Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or
- (4) Dams, diversions, or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or
- (5) Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like unrelated to water quality preclude attainment of aquatic life protection uses; or
- (6) Controls more stringent than those required by sections 301(b) and 306 of the Clean Water Act would result in substantial and widespread economic and social impact. (40 CFR §131.10(g)).

“Existing” uses are defined as uses that were attained on or after 28 November 1975 (40 CFR. §131.3(e)). A use is attained if the use has actually occurred or the water quality necessary to support the use has been achieved, even if the use itself is not currently established, unless physical factors prevent attainment of the use (USEPA 1994).

Time Estimates for MUN De-Designations

Prior to any public participation activities, staff prepares background information on the basin plan amendment process to explain the need for the basin plan amendment and the types of actions that the Central Valley Water Board can consider. In order to determine that MUN can be de-designated, staff will need to assemble water body information, water quality data and flow data for the water bodies of interest. The time estimate to complete this step depends on whether this information is readily available or whether special studies and literature searches are necessary. Generally, the step is allowed six months. However, if water quality or flow data are needed, at least a year is needed to collect adequate data to represent the water body. For the receiving waters that were characterized as agricultural drains, at least eighteen months will be needed to conduct water quality and quantity monitoring and to evaluate and compile the information.

Public participation begins with CEQA Scoping to allow the public an opportunity to comment on environmental impacts that could result from the project and to bring forth alternatives and mitigation measures that could become part of the project. To help the public understand the project, staff will draft an information document and hold a CEQA Scoping meeting. This step takes about three months.

Staff takes the public input to draft a staff report to support a basin plan amendment. The staff report will include an analysis of environmental impacts and cost considerations. Staff will draft basin plan amendment language. This step takes about six months.

If there is a scientific basis to the draft basin plan amendment language, then the language and staff report must undergo peer review. After peer review comments are received, staff must respond to the comments and revise the basin plan amendment language and staff report, as appropriate. Peer review takes about three months. Staff response to peer review will add another three months.

The draft basin plan amendment language and staff report then undergo public review. After staff response to public comments, the basin plan amendment may be considered by the Board. Prior to Board consideration of the adoption of the amendment the Board may hold public workshops to understand details. This public review step will take three months.

After Central Valley Water Board adoption of a basin plan amendment, the amendment must be approved by the State Water Board, the Office of Administrative Law and the USEPA before it becomes effective. The approval process takes at least six months.

The total time for a basin plan amendment is estimated to be at least 42 months. If peer review is not needed, the amendment could be completed in 36 months.