CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2002-0020

NPDES NO. CA0078999

WASTE DISCHARGE REQUIREMENTS FOR CITY OF COLUSA WASTEWATER TREATMENT PLANT COLUSA COUNTY

The California Regional Water Quality Control Board, Central Valley Region, (hereafter Board) finds that:

BACKGROUND

1. The City of Colusa (hereafter Discharger) submitted a Report of Waste Discharge, dated 2 March 2001, and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the City's domestic Wastewater Treatment Plant (WWTP).

2. The Discharger owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to the City of Colusa with a population of approximately 5,500. The treatment plant is in Section 1, T15N, R2W, MDB&M, as shown on Attachment A, a part of this Order. Treated municipal wastewater is discharged to an unnamed tributary to Powell Slough, a water of the United States, to Powell Slough, to the Colusa Trough, and to the Colusa Basin Drain at the point, latitude 39°, 10', 50" and longitude 122°, 01', 48".

3. The treatment system consists of wastewater stabilization ponds, overland flow, and chlorination/dechlorination. Sludge is continuously treated through the stabilization pond system and may be dewatered as necessary and disposed off-site in accordance with an approved workplan.

4. The Report of Waste Discharge describes the wastewater discharge as follows:

Design Flow Rate	0.90	million gallons per day (mgd)
Average Daily Flow Rate	0.66	mgd
Maximum Daily Flow Rate	2.52	mgd
Average Temperature, Summer	74.7	ºF
Average Temperature, Winter	53.8	ºF
Average Daily Biochemical Oxygen Demand (BOD)[1]	37	mg/*l*
Maximum Daily BOD	203	mg/*l*
Average Daily Total Suspended Solids (TSS)	96	mg/*l*
Maximum Daily TSS	320	mg/*l*

[1] 5-day, 20ºC biochemical oxygen demand

5. The Board adopted a *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

6. The United States Environmental Protection Agency (U.S. EPA) adopted the *National Toxics Rule* (NTR) on 5 February 1993 and the *California Toxics Rule* (CTR) on 18 May 2000. These Rules contain water quality standards applicable to this discharge. The State Water Resources Control Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the *State Implementation Plan* or SIP), which contains guidance on implementation of the NTR and the CTR.

BENEFICIAL USES OF THE RECEIVING STREAM

7. The Basin Plan states, on page II-1.00, "*Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning…*" and "*disposal of wastewaters is* [not] *a prohibited use of waters of the state; it is merely a use which cannot be satisfied to the detriment of beneficial uses*." The existing and beneficial uses that currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1 of the Basin Plan. The beneficial uses of any specifically identified water body apply to its tributary streams. It should be noted that it is impractical to list every surface water body in the Region. For unidentified water bodies, the beneficial uses will be established by the tributary rule. The unnamed tributary to Powell Slough is in the Colusa Basin Drain Subarea in the Sacramento Hydrologic Basin. The beneficial uses of the unnamed tributary to Powell Slough are not specifically identified in the Basin Plan. The unnamed tributary to Powell Slough is tributary to Powell Slough, the Colusa Trough, and the Colusa Basin Drain. The Colusa Basin Drain is the first body of water downstream of the unnamed tributary to Powell Slough for which the Basin Plan has identified existing and potential beneficial uses. The beneficial uses of the Colusa Basin Drain, as identified in Table II-1 of the Basin Plan, are agricultural irrigation, agricultural stock watering, body contact water recreation, canoeing and rafting, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, warm spawning habitat, and wildlife habitat. Other beneficial uses identified in the Basin Plan apply to the unnamed tributary to Powell Slough, including groundwater recharge and freshwater replenishment. Upon review of the flow conditions, habitat values, and beneficial uses of the unnamed tributary to Powell Slough, the Board finds that the beneficial uses identified in the Basin Plan for the Colusa Basin Drain, are applicable to the unnamed tributary to Powell Slough.

The Board finds that the beneficial uses identified in the Basin Plan for the Colusa Basin Drain are applicable to the unnamed tributary to Powell Slough based upon the following:

a. *Agricultural Supply*

The State Water Resources Control Board (SWRCB) has recorded water rights to existing water users downstream of the discharge for irrigation uses. Since the unnamed tributary to

Powell Slough is an ephemeral stream, the stream likely provides groundwater recharge during periods of low flow. The groundwater is a source of drinking and irrigation water.

b. *Water Contact (including canoeing and rafting)*

The Board finds that the discharge flows through areas where there is limited public access to the unnamed tributary to Powell Slough, Powell Slough, the Colusa Trough, and the Colusa Basin Drain; however, exclusion of adjoining property owners and the public is unrealistic.

c. *Warm and Cold Freshwater Habitats (including preservation or enhancement of fish, wildlife, and other aquatic resources) and Wildlife Habitat*

The unnamed tributary to Powell Slough flows to Powell Slough, the Colusa Trough, and the Colusa Basin Drain. Pursuant to the Basin Plan tributary rule, the warm and cold freshwater habitat designations applied to the Colusa Basin Drain also apply to the unnamed tributary to Powell Slough. The habitat designation for the unnamed tributary to Powell Slough is appropriate since there is no documentation of the existence of barriers that might prohibit the upstream migration of cold-water and warm-water fish species into these waters. The cold freshwater habitat designation necessitates that the in-stream dissolved oxygen concentration be maintained at, or above, 7.0 mg/*l*.

d. *Groundwater Recharge*

In areas where groundwater elevations are below the stream bottom, water from the stream will percolate to groundwater. During dry weather in many places in California, flowing streams experience these conditions, thus providing groundwater recharge. Since the unnamed tributary to Powell Slough is at times dry, it is reasonable to assume that the stream water is lost by evaporation, flow downstream, and percolation to groundwater which provides a source of municipal and irrigation water supply.

e. *Freshwater Replenishment*

When water is present in the unnamed tributary to Powell Slough and Powell Slough, there is hydraulic continuity between these waters and the Colusa Trough and the Colusa Basin Drain. The unnamed tributary to Powell Slough contributes to the quantity and impacts the quality of the water in Powell Slough, the Colusa Trough, and the Colusa Basin Drain.

The Board also finds that, based on the available information and on the Discharger's application, that the unnamed tributary to Powell Slough, absent the discharge from the wastewater treatment plant, is a low-flow/intermittent stream. The ephemeral natures of the unnamed tributary to Powell Slough and Powell Slough means that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. During

dry weather conditions, the unnamed tributary to Powell Slough may have no or low flow and within a short time period, sufficient precipitation or irrigation flows may increase the flows to provide hydraulic continuity with Powell Slough, the Colusa Trough, and the Colusa Basin Drain. At other times, flows within the unnamed tributary to Powell Slough help support cold-water aquatic life. Both conditions may exist within a short time span, when the receiving waters would be dry without the discharge and periods when sufficient background flows provide hydraulic continuity with the Colusa Basin Drain. Dry conditions occur primarily in the summer months, but dry conditions may also occur throughout the year, particularly in low rainfall years. The lack of available dilution results in more stringent effluent limitations to protect contact recreational uses and aquatic life and to meet agricultural water quality goals.

EFFLUENT LIMITATIONS AND REASONABLE POTENTIAL

8. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

9. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause or contribute to an in-stream excursion above a narrative or numerical water quality standard. This Order contains provisions that:

   a. require the Discharger to provide information as to whether the levels of CTR, NTR, and U.S. EPA priority toxic pollutants in the discharge cause or contribute to an in-stream excursion above a water quality objective;

   b. if the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality objective, require the Discharger to submit information to calculate effluent limitations for those constituents; and

   c. allow the Board to reopen this Order and include effluent limitations for those constituents.

   On 10 September 2001, the Executive Officer issued a letter, in conformance with California Water Code, Section 13267, requiring the Discharger to prepare a technical report assessing water quality. This Order is intended to be consistent with the requirements of the technical report in requiring sampling for NTR, CTR, and additional constituents to determine the full water quality impacts of the discharge. The technical report requirements are intended to be more detailed, listing specific constituents, detection levels, and acceptable time frames and shall take precedence in resolving any conflicts.

10. Section 13263.6(a), California Water Code, requires that "the regional board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW for all substances that the most recent toxic chemical release data reported to the state emergency response commission

pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 United States Code Section 11023) (EPCRKA) indicate as discharged into the POTW, for which the state board or the regional board has established numerical water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective". There is insufficient information to determine if pollutants in the effluent other than those limited by this Order have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective. The study described in the above Finding will determine if additional effluent limitations are necessary.

11. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs the Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above water quality objectives for aluminum, ammonia, chlorine, and copper. Effluent limitations for these constituents are included in this Order.

    A change in treatment process or disposal method, including discharge location, is sufficient to reassess the character of the effluent and the reasonable potential of the discharge's impacts to water quality.

12. The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. The Discharger uses chlorine for disinfection of the effluent waste stream. Chlorine can cause toxicity to aquatic organisms when discharged to surface waters. U.S. EPA recommends, in its Ambient Water Quality Criteria for the Protection of Fresh Water Aquatic Life, maximum 1-hour average and 4-day average chlorine concentrations. The use of chlorine as a disinfectant presents a reasonable potential that it could be discharged in toxic concentrations. Effluent Limitations for chlorine have been included in this Order to protect the receiving stream aquatic life beneficial uses. The effluent limitations have been established at the ambient water quality criteria for chlorine since, absent the discharge, the unnamed tributary to Powell Slough and Powell Slough may not flow during some periods of the year.

13. The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrate. Wastewater treatment plants commonly use nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. U.S. EPA has developed Ambient Water Quality Criteria for ammonia. The discharge from the Colusa Wastewater Treatment Plant has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for ammonia. Effluent limitations for ammonia are included in this Order to assure the treatment process adequately nitrifies the waste stream to protect the beneficial uses of the receiving stream and to prevent

aquatic toxicity.

14. The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. Based on information included in analytical laboratory results submitted by the Discharger and resulting from an inspection by Regional Board staff, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR standards for copper. U.S. EPA developed hardness-dependent National Recommended Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for copper. Analytical results of samples collected by the Discharger and by Regional Board staff indicate that discharged copper concentrations have exceeded the recommended one-hour and four-day average criteria. The effluent limitations for copper, included in this Order, are presented in total concentrations, and are based on U.S. EPA's Ambient Water Quality Criteria for the protection of freshwater aquatic life as included in the CTR.

15. The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. Based on information included in analytical laboratory reports submitted by the Discharger, aluminum in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect aquatic life. U.S. EPA developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum. The concentration in the effluent sample collected by the Discharger exceeded a recommended criterion. Effluent limitations for aluminum are included in this Order and are based on U.S. EPA's Ambient Water Quality Criteria for the protection of freshwater aquatic life.

16. 40 Code of Federal Regulations (CFR) §133 allows for the adjustment of BOD and TSS limits for facilities that provide treatment equivalent to secondary treatment utilizing stabilization ponds as the principal method of treatment. The Discharger's facility uses waste stabilization ponds as the principal treatment process. Waste Discharge Requirements, Order No. 90-207, adjusted the monthly average BOD and TSS limits to 60 mg/*l* and 110 mg/*l*, respectively, in accordance with federal regulations, based on a regional analysis of this and several neighboring pond systems. The BOD and TSS limits were carried forth in Order No. 96-238 and are unchanged in this permit until the tertiary treatment requirements, defined below, are in effect.

17. The beneficial uses of the unnamed tributary to Powell Slough, Powell Slough, and the Colusa Basin Drain include contact recreation uses and irrigation. To protect these beneficial uses, the Board finds that the wastewater must be disinfected and adequately treated to prevent disease. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered) to protect contact recreational and food crop irrigation uses.

    The California Department of Health Services (DHS) has developed reclamation criteria, California Code of Regulations, Title 22, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, school

yards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 m*l* as a 7-day median. Title 22 is not directly applicable to surface waters; however, the Board finds that it is appropriate to apply DHS's reclamation criteria because the unnamed tributary to Powell Slough, Powell Slough, and the Colusa Basin Drain are used for irrigation of agricultural land and for contact recreation purposes. The stringent disinfection criteria of Title 22 are appropriate since the undiluted effluent may be used for the irrigation of food crops. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DHS.

In addition to coliform testing, a turbidity effluent limitation has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The tertiary treatment process, or equivalent, is also capable of reliably meeting a turbidity limitation of 2 nephelometric turbidity units (NTU) as a daily average. Failure of the filtration system such that virus removal is impaired would normally result in increased particles in the effluent, which result in higher effluent turbidity. Turbidity has a major advantage for monitoring filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours, to days, to identify high coliform concentrations.

The application of tertiary treatment processes results in the ability to achieve lower levels for BOD and TSS than the secondary standards currently prescribed; the 30-day average BOD and TSS limitations have been revised to 10 mg/*l*, in accordance with the time schedule included in this Order, which is technically based on the capability of a tertiary system. In addition to pathogen reduction, application of tertiary treatment will result in improved water quality by removing oxygen-demanding substances and solids from the wastewater and reducing dissolved oxygen depletion in the receiving stream.

Compliance with tertiary limitations has not been previously required for this discharge; therefore, a schedule for compliance with the tertiary treatment requirement is included as a Provision in this Order. Alternatives to tertiary treatment, such as land disposal or discharge to a different water body with assimilative capacity, would require modification of the permit.

GROUNDWATER

18. The beneficial uses of the underlying ground water, as identified in the Basin Plan, are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply.

19. Basin Plan water quality objectives to protect the beneficial uses of groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity of groundwater, and taste and odor. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, or animals. The chemical constituent objective states groundwater shall not

contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the maximum contaminant levels (MCLs) in Title 22, CCR. The Basin Plan requires the application of the most stringent objective necessary as necessary to ensure that groundwaters do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

20. State Water Resources Control Board (SWRCB) Resolution No. 68-16 (hereafter Resolution 68-16) requires the Board in regulating discharge of waste to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Board's policies (e.g., quality that exceeds water quality objectives). Resolution 68-16 requires that the discharge be regulated to meet best practicable treatment or control to assure that pollution or nuisance will not occur and the highest water quality consistent with the maximum benefit to the people of the State be maintained.

21. Domestic wastewater contains constituents such as total dissolved solids (TDS), specific conductivity, pathogens, nitrates, organics, metals, and oxygen demanding substances (BOD). The Discharger utilizes waste stabilization ponds and overland flow where wastewater may percolate to groundwater; this may result in an increase in the concentration of the constituents listed above in groundwater. The increase in the concentration of these constituents in groundwater must be consistent with Resolution 68-16. Any increase in pollutant concentrations in groundwater must be shown to be necessary to allow wastewater utility service necessary to accommodate housing and economic expansion in the area and must be consistent with maximum benefit to the people of the state of California. Some degradation of groundwater by the Discharger is consistent with Resolution 68-16 provided that:

    a. the degradation is limited in extent;

    b. the degradation after effective source control, treatment, and control is limited to waste constituents typically encountered in municipal wastewater as specified in the Groundwater Limitations in this Order;

    c. the Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures; and

    d. the degradation does not result in water quality less than that prescribed in the Basin Plan.

22. Monitoring of the groundwater must be conducted to determine if the discharge has caused an increase in constituent concentrations, when compared to background. The monitoring, at a minimum, requires a complete assessment of groundwater impacts, including the vertical and lateral extent of any degradation; an assessment of all wastewater-related constituents which may have migrated to groundwater; and an analysis of whether additional or different methods of treatment or control of the discharge are necessary to provide best practicable treatment or control to comply with Resolution 68-16.

Economic analysis is only one of many factors considered in determining best practicable treatment. If monitoring indicates that the discharge has incrementally increased constituent concentrations in groundwater above background, this permit may be reopened and modified. Until groundwater monitoring is sufficient, this Order contains Groundwater Limitations that allow groundwater quality to be degraded for certain constituents when compared to background groundwater quality, but not to exceed water quality objectives. If groundwater quality has been degraded by the discharge, the incremental change in pollutant concentration (when compared with background) may not be increased. If groundwater quality has been or may be degraded by the treatment processes or discharge, this Order may be reopened and specific numeric limitations established consistent with Resolution 68-16 and the Basin Plan.

23. The discharge authorized herein and the treatment and storage facilities associated with the discharge of treated municipal wastewater, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, California Code of Regulations (CCR), Section 20005 *et seq*. (hereafter Title 27). The exemption, pursuant to Title 27 CCR Section 20090(a), is based on the following:

    a. the waste consists primarily of domestic sewage and treated effluent;

    b. the waste discharge requirements are consistent with water quality objectives; and

    c. the treatment and storage facilities described herein are associated with a municipal wastewater treatment plant.

24. This Order requires the Discharger to continue groundwater monitoring and includes a regular schedule of groundwater monitoring in the attached Monitoring and Reporting Program. The groundwater monitoring reports are necessary to evaluate impacts to waters of the state to assure protection of beneficial uses and compliance with Board plans and policies, including Resolution 68-16. Evidence in the record includes effluent monitoring data that indicates the presence of constituents that may degrade groundwater and surface water.

POND LIMITATIONS

25. The Discharger utilizes waste stabilization ponds for the treatment and disposal of wastewater. Pond Discharge Limitations have been included in this permit to assure that the pond system does not overflow or cause a nuisance. Nuisance conditions from pond systems are typically found when strong odors occur when the dissolved oxygen concentration is allowed to drop below 1.0 mg/*l*. This permit requires the dissolved oxygen concentration be maintained above 1.0 mg/*l* in the upper one-foot of water in the ponds.

26. Ponds levees can fail for a variety of reasons, typically, a lack of maintenance or overtopping due to wave action. This permit requires a minimum pond freeboard be maintained to prevent overtopping.

GENERAL

27. Monitoring is required by this Order for the purposes of assessing compliance with permit limitations and water quality objectives and gathering information to evaluate the need for additional limitations.

28. Monitoring and Reporting Program No. R5-2002-0020, Attachments A through E, and the Fact Sheet, are a part of this Order.

29. This discharge was previously regulated by Waste Discharge Requirements in Order No. 96-238, adopted by the Board on 20 September 1996.

30. U.S. EPA and the Board have classified this discharge as a minor discharge.

31. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

32. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21100, *et seq*.), requiring preparation of an environmental impact report or negative declaration in accordance with Section 13389 of the California Water Code.

33. The Board has considered the information in the attached Fact Sheet in developing the Findings of this Order. The attached Fact Sheet is part of this Order.

34. The Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

35. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

36. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect upon the date of hearing, provided U.S. EPA has no objections.

37. Section 13267 of the California Water Code states, in part, "*(a) A regional board, in establishing…waste discharge requirements… may investigate the quality of any waters of the state within its region"* and *"(b) (1) In conducting an investigation…, the regional board may require that any person who… discharges… waste…that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires.*" The attached Monitoring and Reporting Program is issued pursuant to California Water Code Section 13267. The monitoring and reporting program to monitor groundwater required by this Order and the attached Monitoring and Reporting Program are

necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges waste subject to this Order.

IT IS HEREBY ORDERED that Order No. 96-238 is rescinded and the City of Colusa, its agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions:

1. Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.

2. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13. [See attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)"].

3. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

4. The average dry weather influent flow shall not exceed 0.90 million gallons per day.

B. Effluent Limitations:

1a. Effluent shall not exceed the following limits (from adoption until **31 January 2007**):

Constituents	Units	Average Monthly	Average Weekly	30-Day Median	Average Daily	Daily Maximum
BOD[1]	mg/*l*	60[2]	90[2]	--	120[2]	--
	lbs/day[3]	451	676	--	901	--
Total Suspended Solids	mg/*l*	110[2]	165[2]	--	220[2]	--
	lbs/day[3]	826	1239	--	1652	--
Settleable Solids	m*l*/*l*	0.1	--	--	0.2	--
Total Coliform Organisms	MPN/100 m*l*	--	--	23	--	500

[1] 5-day, 20ºC biochemical oxygen demand (BOD)
[2] To be ascertained by a 24-hour composite
[3] Based upon a design treatment capacity of 0.90 mgd (*x* mg/*l* x 8.345 x 0.90 mgd = *y* lbs/day)

Constituent	Units	Average Monthly	4-Day Average	1-Hour Average
Total Residual Chlorine	mg/*l*	--	0.011	0.019
	lb/day[1]	--	0.083	0.14
Ammonia (as N)	mg/*l*	Attachment B	Attachment C	Attachment D
	lb/day[2]			
Aluminum	µg/*l*	--	87	750
	lb/day[3]	--	0.65	5.6

[1] Based upon a design treatment capacity of 0.90 mgd (*x* mg/l x 8.345 x 0.90 mgd = *y* lbs/day)

[2] The mass limit (lb/day) for ammonia shall be equal to the concentration limit (from Attachments) multiplied by the design flow of 0.90 mgd and the unit conversion factor of 8.345 (see footnote 1 for equation).

[3] Based upon a design treatment capacity of 0.90 mgd [*x* µg/*l* x (1 mg/1000 µg) x 8.345 x 0.90 mgd = *y* lbs/day]

1b. Effluent shall not exceed the following limits (after **31 January 2007**):

Constituents	Units	Average Monthly	Average Weekly	7-Day Median	Average Daily	Instantaneous Maximum
BOD[1]	mg/*l*	10[2]	15[2]	--	20[2]	--
	lbs/day[3]	42	63	--	84	--
Total Suspended Solids	mg/*l*	10[2]	15[2]	--	20[2]	--
	lbs/day[3]	42	63	--	84	--
Settleable Solids	ml/*l*	0.1	--	--	0.2	--
Total Coliform Organisms	MPN/100 m*l*	--	--	2.2	--	23[4]
Turbidity	NTU	--	--	--	2	5[5]

[1] 5-day, 20ºC biochemical oxygen demand (BOD)

[2] To be ascertained by a 24-hour composite

[3] Based upon a design treatment capacity of 0.90 mgd (*x* mg/*l* x 8.345 x 0.90 mgd = *y* lbs/day)

[4] The total coliform organisms concentration shall not exceed 23 MPN/100 m*l* more than once in any 30-day period. No sample shall exceed a concentration of 240 MPN/100 m*l*.

[5] The turbidity shall not exceed 5 NTU more than 5 percent of the time within a 24-hour period. At no time shall the turbidity exceed 10 NTU.

Constituents	Units	Average Monthly	Average 4-Day	Average Daily	Average 1-Hour
Total Residual Chlorine	mg/*l*	--	0.011	--	0.019
	lb/day[1]	--	0.083	--	0.14

[1] Based upon a design treatment capacity of 0.90 mgd (*x* mg/*l* x 8.345 x 0.90 mgd = *y* lbs/day)

Constituents	Units	Average Monthly	Average 4-Day	Average Daily	Average 1-Hour
Ammonia (as N)	mg/*l*	Attachment B	Attachment C	--	Attachment D
	lb/day[2]			--	
Copper	µg/*l*	Attachment E	--	Attachment E	--
	lb/day[3, 4]				
Aluminum	µg/*l*	--	87	--	750
	lb/day[3]	--	0.65	--	5.6

[2] The mass limit (lb/day) for ammonia shall be equal to the concentration limit (from Attachments) multiplied by the design flow of 0.90 mgd and the unit conversion factor of 8.345 (see footnote 1 for equation).

[3] Based upon a design treatment capacity of 0.90 mgd [*x* µg/*l* x (1 mg/1000 µg) x 8.345 x 0.90 mgd = *y* lbs/day]

[4] The mass limit (lb/day) shall calculated according to the equation shown in footnote 4, where x µg/*l* is the concentration limitation from Attachment E.

2. Wastewater shall be oxidized, coagulated, and filtered, or equivalent treatment provided after **31 January 2007**.

3. The arithmetic mean of 20°C BOD (5-day) and of total suspended solids in effluent samples collected over a calendar month shall not exceed 15 percent of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period (85 percent removal) after **31 January 2007**.

4. Survival of aquatic organisms in 96-hour bioassays of undiluted effluent shall be no less than:

   Minimum for any one bioassay - - - - - - - - - - - - 70%
   Median for any three consecutive bioassays - - - - 90%

C. Pond Limitations:

1. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment and disposal areas.

2. As a means of discerning compliance with Pond Limitation No.1, the dissolved oxygen content in the upper zone (1 foot) of wastewater in ponds shall not be less than 1.0 mg/*l*.

3. Ponds shall not have a pH less than 6.5 or greater than 8.5 as a daily average.

4. Ponds shall be managed to prevent breeding of mosquitoes. In particular,

a. an erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface;

b. weeds shall be minimized; and

c. dead algae, vegetation, and debris shall not accumulate on the water surface.

5. Public contact with wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.

6. Freeboard shall never be less than two feet (measured vertically to the lowest point of overflow).

D. Sludge Disposal:

1. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in California Code of Regulations, Title 27, Division 2, Subdivision 1, Section 20005, *et seq*.

2. Any proposed change in sludge use or disposal practice from a previously approved practice shall be reported to the Executive Officer and U.S. EPA Regional Administrator at least **90 days** in advance of the change.

3. Use and disposal of sewage sludge shall comply with existing Federal and State laws and regulations, including permitting requirements and technical standards included in 40 CFR 503.

4. If the State Water Resources Control Board and the Regional Water Quality Control Boards are given the authority to implement regulations contained in 40 CFR 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR 503 whether or not they have been incorporated into this Order.

5. The Discharger is encouraged to comply with the "Manual of Good Practice for Agricultural Land Application of Biosolids" developed by the California Water Environment Association.

E. Receiving Water Limitations:

Receiving Water Limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit.

The discharge shall not cause the following in the receiving water:

1. The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, to exceed a geometric mean of 200 MPN/100 m*l* or cause more than 10 percent of total samples taken during any 30-day period to exceed 400 MPN/100 m*l*.

2. Biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.

3. Esthetically undesirable discoloration.

4. Concentrations of dissolved oxygen to fall below 7.0 mg/*l*. The monthly median of the mean daily dissolved oxygen concentration shall not be caused to fall below 85 percent of saturation in the main water mass, and the 95th percentile concentration shall not be caused to fall below 75 percent of saturation.

5. Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.

6. Oils, greases, waxes, or other materials to accumulate in concentrations that cause nuisance, result in a visible film or coating on the water surface or on objects in the water, or otherwise adversely affect beneficial uses.

7. The ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 units. An one-month averaging period may be applied when calculating the pH change of 0.5 units.

8. Radionuclides to be present in concentrations that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

9. Deposition of material that causes nuisance or adversely affects beneficial uses.

10. Taste- or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.

11. The ambient temperature to increase more than 5°F.

12. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.

13. The turbidity to increase as follows:

a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.

b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.

c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.

d. More than 10 percent where natural turbidity is greater than 100 NTUs.

14. When wastewater is treated to a tertiary level, a one-month averaging period may be used when determining compliance with Receiving Water Limitation 13.a.

15. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.

16. Upon adoption of any applicable water quality standard for receiving waters by the Board or the State Water Resources Control Board pursuant to the CWA and regulations adopted thereunder, this permit may be reopened and receiving water limitations added.

F. Groundwater Limitations:

Release of waste constituents from any storage, treatment, or disposal component associated with the WWTP shall not, in combination with other sources of the waste constituents, cause the following in groundwater:

1. Beneficial uses to be adversely impacted or water quality objectives to be exceeded.

2. Any constituent concentration, when compared with background, to be incrementally increased beyond the current concentration.

G. Provisions:

1. The treatment facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

2. Within **eighteen months** of the adoption of this Order, the Discharger shall complete a hydrogeologic investigation within the area affected and potentially affected by the WWTP. The technical report documenting the hydrogeologic investigation shall describe the underlying geology, existing wells (active and otherwise), local well construction practices and standards, well restrictions, hydrogeology and assess all impacts of the wastewater discharge on water quality. The groundwater quality must be monitored at least twice for U.S. EPA priority pollutants, nutrients, coliform organisms, pH, TDS, and EC. The technical report must present, for each monitoring event, determinations for the direction and gradient of groundwater flow. The groundwater monitoring network shall include one or more

background monitoring wells and a sufficient number of designated monitoring wells to evaluate performance of BPTC measures and compliance with this Order's groundwater limitations. These include monitoring wells immediately downgradient of every treatment, storage, and disposal unit that does or may release waste constituents to groundwater with the exception of wastewater reclamation areas. All wells shall comply with appropriate standards as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981), and any more stringent standards adopted by the Discharger or county pursuant to CWC Section 13801. The existing well network will be evaluated, and the proposed network should include existing monitoring wells where they will serve to measure compliance or provide other relevant information (e.g., depth to groundwater). The Discharger shall install approved monitoring wells and commence groundwater monitoring in accordance with this Order's Monitoring and Reporting Program. After the first sampling event, the Discharger shall report on its sampling protocol as specified in this Order's Monitoring and Reporting Program (MRP). After one year of monitoring, the Discharger shall characterize natural background quality of monitored constituents in a technical report. If the monitoring shows that any constituent concentrations are increased above background water quality, the Discharger shall submit a technical report describing the evaluation's results and critiquing each evaluated component with respect to BPTC and minimizing the discharge's impact on groundwater quality. Where treatment system deficiencies are documented, the technical report shall provide recommendations for necessary modifications (e.g., new or revised salinity source control measures, WWTP component upgrade and retrofit) to achieve BPTC and identify the source of funding and proposed schedule for modifications for achieving full compliance prior to expiration of this Order. This Order may be reopened and additional groundwater limitations added.

3. The Discharger shall not allow pollutant-free wastewater to be discharged into the collection, treatment, and disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.

4. There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of water quality objectives. The constituents are specifically listed in a technical report requirement issued by the Executive Officer on 10 September 2001 and include NTR, CTR, and additional constituents, which could exceed Basin Plan numeric or narrative water quality objectives. The Discharger shall comply with the following time schedule in conducting a study of the potential effect(s) of these constituents in surface waters:

Task	Compliance Date
Submit Study Report	**1 March 2003**
Submit Study Report for dioxins	**1 March 2004**

This Order is intended to be consistent with the requirements of the 10 September 2001 technical report. The technical report requirements shall take precedence in resolving any conflicts. The Discharger shall submit to the Board on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Board by letter when it returns to compliance with the time schedule.

On or before each compliance date, the Discharger shall submit to the Board the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Board by letter when it returns to compliance with the time schedule.

If, after review of the study results, it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective, this Order will be reopened and effluent limitations added for the subject constituents.

5. The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger shall initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the State Water Resources Control Board, this Order may be reopened and a limitation based on that objective included.

6. The Discharger shall comply with the following time schedule to assure compliance with the tertiary treatment requirements and associated Effluent Limitations of this Order:

Task	Compliance Date	Report Due Date
Submit Annual Status Report		**1 February, annually**
Submit Workplan/Time Schedule		**1 December 2002**
Full Compliance	**1 February 2007**	

The Discharger shall submit to the Board on or before each compliance and report due date, the specified document or, if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated; the report shall also include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the

Board by letter when it returns to compliance with the time schedule.

7. The Discharger shall use the best practicable treatment or control technique currently available to limit mineralization to no more than a reasonable increment.

8. The Discharger shall report to the Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to Section 313 of the "Emergency Planning and Community Right to Know Act of 1986".

9. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions".

10. The Discharger shall comply with Monitoring and Reporting Program No. R5-2002-0020, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

    When requested by U.S. EPA, the Discharger shall complete and submit Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for discharger self-monitoring reports.

11. Minimum detection levels for monitoring required by this Order shall, unless impracticable, be adequate to demonstrate compliance with permit limitations.

12. This Order expires on **1 March 2007** and the Discharger must file a Report of Waste Discharge in accordance with California Code of Regulations, Title 23, not later than **180 days in advance** of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.

13. The Discharger shall implement the necessary legal authorities, programs, and controls to ensure that the following incompatible wastes are not introduced to the treatment system, where incompatible wastes are:

    a. wastes that create a fire or explosion hazard in the treatment works;

    b. wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is specially designed to accommodate such wastes;

    c. solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;

d. any waste, including oxygen demanding pollutants (BOD, *etc.*), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;

e. heat in amounts that inhibit or disrupt biological activity in the treatment works, or that raise influent temperatures above 40ºC (104ºF), unless the Regional Board approves alternate temperature limits;

f. petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

g. pollutants which result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and

h. any trucked or hauled pollutants, except at points predesignated by the Discharger.

14. The Discharger shall implement the legal authorities, programs, and controls necessary to ensure that indirect discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:

    a. flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or

    b. inhibit or disrupt treatment processes, treatment system operations, or sludge processes, or cause a violation of this Order, or

    c. prevent sludge use or disposal in accordance with this Order.

15. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of, or clearance from, the State Water Resources Control Board (Division of Water Rights).

16. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office.

    To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 and state that the new owner or operator assumes full responsibility for compliance with this Order.

Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

I, GARY M. CARLTON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 1 March 2002.

_____
GARY M. CARLTON, Executive Officer

Amended

MRH/mrh

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2002-0020

NPDES NO. CA0078999

FOR

CITY OF COLUSA
WASTEWATER TREATMENT PLANT
COLUSA COUNTY

This Monitoring and Reporting Program is issued pursuant to Water Code Division 7, Ch. 5.5. The Discharger shall not implement any changes to this Program unless and until the Regional Board or Executive Officer issues a revised Monitoring and Reporting Program. Specific sample station locations shall be established under direction of the Board's staff, and a description of the stations shall be attached to this Order.

INFLUENT MONITORING

Samples shall be collected at approximately the same time as effluent samples and should be representative of the influent for the period sampled. Influent monitoring shall include at least the following:

Constituents	Units	Type of Sample	Sampling Frequency
20°C BOD_5	mg/*l*, lbs/day	24-hr. Composite[1]	Twice Monthly
Total Suspended Solids	mg/*l*, lbs/day	24-hr. Composite[1]	Twice Monthly
Flow	mgd	Meter	Continuous

[1] The BOD and TSS samples shall be flow proportional composite samples.

EFFLUENT MONITORING

Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall, following the last unit process. Effluent samples should be representative of the volume and quality of the discharge. Samples collected from the outlet structure of ponds will be considered adequately composited. Time of collection of samples shall be recorded. Effluent monitoring shall include at least the following:

Constituents	Units	Type of Sample	Sampling Frequency
Flow	mgd	Meter	Continuous

Constituents	Units	Type of Sample	Sampling Frequency
Total Residual Chlorine	mg/*l*, lbs/day	Meter	Continuous[1]
Turbidity	NTU	Grab	Continuous [2]
Total Coliform Organisms[3]	MPN/l00 m*l*	Grab	3 Times Weekly[4]
pH	Number	Grab	Twice Weekly
Ammonia[5, 6, 7,8]	mg/*l*, lbs/day (as N)	Grab	Weekly
20°C BOD_5	mg/*l*, lbs/day	24-hr. Composite[9]	Weekly
Total Suspended Solids	mg/*l*, lbs/day	24-hr. Composite[9]	Weekly
Settleable Solids	m*l*/*l*	Grab	Weekly
Electrical Conductivity @ 25°C	µmhos/cm	Grab	Weekly
Temperature	°F	Grab	Weekly
Hardness	mg/*l* (as $CaCO_3$)	Grab[11]	Monthly
Copper[7, 10]	µg/*l*, lbs/day	Grab[11]	Quarterly
Aluminum[12]	µg/*l*, lbs/day	Grab[11]	Quarterly
Total Dissolved Solids	mg/*l*	Grab	Quarterly
Acute Toxicity[13,14]	% Survival	Grab	Twice Annually

1 The continuous chlorine residual monitoring system, or functional equivalent, shall be operational no later than 1 January 2007. Until that time, grab samples shall be collected and analyzed daily.

2 A continuous turbidity monitoring system, or functional equivalent, shall be operational no later than 1 January 2007. Until that time, grab samples shall be collected and analyzed weekly.

3 Total coliform organisms samples may be collected at any point following disinfection, provided that samples are dechlorinated at the time of collection. The Discharger shall report the sampling location(s) in the monthly self-monitoring reports.

4 Total coliform organisms shall be monitored twice weekly until completion of the tertiary treatment plant. After the tertiary treatment plant is complete, the monitoring frequency for total coliform organisms shall be increased to three times per week.

5 Report as total ammonia.

6 Concurrent with biotoxicity monitoring.

7 In reporting lbs/day, the Discharger shall report both the lbs/day discharged and the calculated lbs/day limitation.

8 Temperature and pH shall be recorded at the time of ammonia sample collection.

9 The BOD and TSS samples shall be flow proportional composite samples.

10 Copper shall be analyzed using a method having a minimum level of no more than 0.5 µg/*l*.

11 Samples shall be grab samples except for the months when priority pollutants are being sampled; in those months, samples shall be flow proportional 24-hour composite samples.

12 Aluminum samples may be analyzed using the acid-soluble method described in U.S. EPA's *Ambient Water Quality Criteria for Aluminum – 1988* [EPA 440/5-86-008], with the modification that an inductively coupled plasma (ICP)/mass spectrometry analysis be substituted for the ICP/atomic emission spectrometric analysis.

Constituents	Units	Type of Sample	Sampling Frequency
Priority Pollutants[15,16]	mg/*l*	As Appropriate[17]	Annually[18]

[13] The acute bioassay samples shall be analyzed using EPA/600/4-90/027F, Fourth Edition, or later amendment with Board staff approval. Temperature and pH shall be recorded at the time of bioassay sample collection. Test species shall be fathead minnows (*Pimephales promelas*), with no pH adjustment unless approved by the Executive Officer.

[14] Concurrent with ammonia monitoring.

[15] All peaks are to be reported, along with any explanation provided by the laboratory.

[16] Priority Pollutants are U.S. EPA priority toxic pollutants and consist of the constituents listed in the most recent National Toxics Rule and California Toxics Rule.

[17] Volatile samples shall be grab samples; the remainder shall be flow proportional 24-hour composite samples.

[18] Hardness, pH, and temperature data shall be collected at the same time and on the same date as the Priority Pollutant samples.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

RECEIVING WATER MONITORING

Receiving water monitoring is required only during periods of discharge. All receiving water samples shall be grab samples. Receiving water monitoring shall include at least the following:

Station	Description
R-1	Unnamed stormwater tributary to the unnamed tributary to Powell Slough, as far as possible upstream from the point of discharge while still being below the first upstream agricultural discharge, but no more than 50 feet upstream
R-2	Unnamed tributary to Powell Slough, as far as possible downstream from the point of discharge while still being above the first downstream agricultural discharge, but no more than 200 feet downstream
R-3	Powell Slough, 250 feet upstream from the confluence of the unnamed tributary to Powell Slough with Powell Slough
R-4	Powell Slough, 400 feet downstream from the confluence of the unnamed tributary to Powell Slough with Powell Slough

Constituents	Units	Station	Sampling Frequency
Dissolved Oxygen	mg/*l*[1]	R-l, R-2, R-3, R-4	Weekly
	% saturation[2]		
pH	Number	R-l, R-2, R-3, R-4	Weekly
Turbidity	NTU	R-l, R-2, R-3, R-4	Weekly
Temperature	°F (°C)	R-l, R-2, R-3, R-4	Weekly
Electrical Conductivity @25°C	µmhos/cm	R-l, R-2, R-3, R-4	Weekly
Fecal Coliform Organisms	MPN/100 m*l*	R-l, R-2, R-3, R-4	Quarterly
Radionuclides	pCi/*l*[3]	R-l, R-2, R-3, R-4	Annually

[1] Temperature shall be determined at the time of sample collection for use in determining saturation concentration. Any additional factors or parameters used in determining saturation concentration shall also be reported.

[2] Report both percent saturation and saturation concentration.

[3] pCi/*l* = picocuries per liter

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-l, R-2, R-3, and R-4. Attention shall be given to the presence or absence of:

a. Floating or suspended matter
b. Discoloration
c. Bottom deposits
d. Aquatic life
e. Visible films, sheens, or coatings
f. Fungi, slimes, or objectionable growths
g. Potential nuisance conditions

Notes on receiving water conditions shall be summarized in the monitoring report.

THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring shall be conducted to determine whether the effluent is contributing toxicity to the receiving water. The testing shall be conducted as specified in EPA 600/4-91/002. Chronic toxicity samples shall be collected from the effluent of the wastewater treatment plant, after the last unit process, prior to its entering the receiving stream. Twenty-four hour composite samples shall be representative of the volume and quality of the discharge. Time of collection of samples shall be recorded. Control waters shall be obtained immediately upstream of the discharge from an area unaffected by the discharge in the receiving waters. The sensitivity of the test organisms to a reference toxicant shall be determined concurrently with each bioassay and reported with the test results. Monthly laboratory reference toxicant tests may be substituted. Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then the Discharger must re-sample and re-test within 14 days. Chronic toxicity monitoring shall include the following:

Species: *Pimephales promelas* (larval stage), *Ceriodaphnia dubia,* and *Selenastrum capricornutum*

Frequency: Once per quarter, two quarters per year

Dilution Series: None—tests shall be conducted using 100% effluent.

SLUDGE MONITORING

A composite sample of sludge shall be collected when sludge is removed from the ponds for disposal in accordance with U.S. EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989, and tested for the metals listed in Title 22.

Sampling records shall be retained for a minimum of five years. A log shall be kept of sludge quantities generated and of handling and disposal activities. The frequency of entries is discretionary; however, the log should be complete enough to serve as a basis for part of the annual report.

Upon removal of sludge, the Discharger shall submit characterization of sludge quality, including sludge percent solids and quantitative results of chemical analysis for the priority pollutants listed in 40 CFR 122 Appendix D, Tables II and III (excluding total phenols). All sludge samples shall be a composite of a minimum of twelve (12) discrete samples taken at equal time intervals over 24 hours. Suggested methods for analysis of sludge are provided in U.S. EPA publications titled "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods" and "Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater". Recommended analytical holding times for sludge samples should reflect those specified in 40 CFR 136.6.3(e). Other guidance is available in U.S. EPA's POTW Sludge Sampling and Analysis Guidance Document, August 1989.

WATER SUPPLY MONITORING

A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Water supply monitoring shall include at least the following:

Constituents	Units	Sampling Frequency
Electrical Conductivity @ 25°C	µmhos/cm	Annually
Total Dissolved Solids	mg/*l*	Annually

If the water supply is from more than one source, the monitoring report shall report the electrical conductivity and total dissolved solids results as a weighted average and include copies of supporting calculations.

GROUNDWATER MONITORING

Groundwater grab samples shall be collected from all groundwater monitoring wells. Prior to sampling, the wells should be pumped until the temperature, specific conductivity, and pH have stabilized to ensure representative samples. Groundwater monitoring shall include at least the following:

Constituents	Units	Sampling Frequency
Depth to Groundwater[1]	feet	Monthly
Groundwater Elevation[1]	feet	Monthly
pH	--	Monthly
Electrical Conductivity at 25ºC	µmhos/cm	Monthly
Nitrogen	mg/*l*	Quarterly
Total Coliform Organisms	MPN/100 m*l*	Quarterly
Priority Pollutants[2, 3]	µg/*l*	[4]

1 The groundwater elevation shall be used to calculate the direction and gradient of groundwater flow. Elevations shall be measured to the nearest one-hundredth of a foot from mean sea level. The groundwater elevation shall be measured prior to purging the wells.

2 All peaks are to be reported, along with any explanation provided by the laboratory.

3 Priority Pollutants are U.S. EPA priority toxic pollutants and consist of the constituents listed in the most recent National Toxics Rule and California Toxics Rule.

4 Priority Pollutants must be monitored at least once during the life of the permit in addition to the monitoring required under Provision 2 of this Order.

Groundwater monitoring results for the constituents above shall be submitted monthly; the monthly report shall include a site map showing the location and surveyed elevation (to nearest one-hundredth of foot above mean sea level) of the wells and the current direction of groundwater flow.

A groundwater report shall be submitted annually; the report shall contain a brief written description of any groundwater investigation and sampling work completed for the year, a site map showing the location of all monitoring wells, and tables showing all groundwater monitoring data collected during the previous calendar year, including groundwater depth and elevation data, pH, EC, and all other monitored constituents.

REPORTING

Discharger self-monitoring results shall be submitted to the Regional Board monthly. Monitoring results shall be submitted by the **first day of the second month** following sample collection. Quarterly, semi-annual, and annual monitoring results shall be submitted by the **first day of the second month following each calendar quarter**.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner as to clearly illustrate whether the discharge complies with waste discharge requirements. Monthly maximums, minimums, and averages shall be reported for each monitored constituent and parameter. Removal efficiencies (%) for biochemical oxygen demand and total suspended solids and all periodic averages and medians for which there are limitations shall also be calculated and reported.

The Discharger shall report minimum levels and method detection limits as defined in and required by the SIP.

With the exception of flow, all constituents monitored on a continuous basis (metered) shall be reported as daily maximums, daily minimums, and daily averages; flow shall be reported as the total volume discharged per day for each day of discharge.

If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the certification statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions.

By **1 February** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

a. the names, certificate grades, and general responsibilities of all persons employed at the WWTP (Standard Provision A.5);.

b. the names and telephone numbers of persons to contact regarding the plant for emergency and routine situations;

c. a statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6); and

d. a statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.

The Discharger may also be requested to submit an annual report to the Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

The Discharger shall implement the above monitoring program on the first day of the month following the effective date of this Order.

Ordered by: _____
GARY M. CARLTON, Executive Officer

1 March 2002
(Date)

MRH:mrh

Temperature- and pH-Dependent Effluent Limits for Ammonia
Criterion Continuous Concentration, Maximum Average Monthly Concentration

Ammonia Concentration Limitation (mg N/*l*)										
	Temperature, ºC (ºF)									
pH	**0** (32)	**14** (57)	**16** (61)	**18** (64)	**20** (68)	**22** (72)	**24** (75)	**26** (79)	**28** (82)	**30** (86)
6.5	6.67	6.67	6.06	5.33	4.68	4.12	3.62	3.18	2.80	2.46
6.6	6.57	6.57	5.97	5.25	4.61	4.05	3.56	3.13	2.75	2.42
6.7	6.44	6.44	5.86	5.15	4.52	3.98	3.50	3.07	2.70	2.37
6.8	6.29	6.29	5.72	5.03	4.42	3.89	3.42	3.00	2.64	2.32
6.9	6.12	6.12	5.56	4.89	4.30	3.78	3.32	2.92	2.57	2.25
7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

$$CCC = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) x\ MIN\left(2.85, 1.45 \cdot 10^{0.028(25-T)}\right)$$

Where: CCC = criteria continuous concentration
T = temperature in degrees Celsius (ºC)

Temperature- and pH-Dependent Effluent Limits for Ammonia
Maximum 4-day Average

Ammonia Concentration Limitation (mg N/*l*)										
	Temperature, ºC (ºF)									
pH	**0** (32)	**14** (57)	**16** (61)	**18** (64)	**20** (68)	**22** (72)	**24** (75)	**26** (79)	**28** (82)	**30** (86)
6.5	16.7	16.7	15.1	13.3	11.8	10.3	9.04	7.95	6.99	6.14
6.6	16.4	16.4	14.9	13.1	11.5	10.1	8.91	7.83	6.88	6.05
6.7	16.1	16.1	14.6	12.9	11.3	9.94	8.74	7.68	6.75	5.94
6.8	15.7	15.7	14.3	12.8	11.1	9.71	8.54	7.51	6.60	5.80
6.9	15.3	15.3	13.9	12.2	10.7	9.44	8.30	7.30	6.41	5.64
7.0	14.8	14.8	13.4	11.8	10.4	9.12	8.02	7.05	6.19	5.45
7.1	14.2	14.2	12.9	11.3	9.95	8.75	7.69	6.76	5.94	5.22
7.2	13.5	13.5	12.3	10.8	9.46	8.32	7.31	6.43	5.65	4.97
7.3	12.7	12.7	11.5	10.1	8.91	7.84	6.89	6.05	5.32	4.68
7.4	11.8	11.8	10.8	9.46	8.31	7.31	6.42	5.65	4.96	4.36
7.5	10.9	10.9	9.92	8.72	7.66	6.74	5.92	5.20	4.57	4.02
7.6	9.94	9.94	9.03	7.94	6.98	6.14	5.39	4.74	4.17	3.66
7.7	8.95	8.95	8.13	7.15	6.28	5.52	4.85	4.27	3.75	3.30
7.8	7.96	7.96	7.23	6.36	5.59	4.91	4.32	3.79	3.34	2.93
7.9	6.99	6.99	6.36	5.59	4.91	4.32	3.80	3.34	2.93	2.58
8.0	6.08	6.08	5.53	4.86	4.27	3.76	3.30	2.90	2.55	2.24
8.1	5.24	5.24	4.77	4.19	3.68	3.24	2.85	2.50	2.20	1.93
8.2	4.48	4.48	4.07	3.58	3.15	2.77	2.43	2.14	1.88	1.65
8.3	3.81	3.81	3.46	3.04	2.68	2.35	2.07	1.82	1.60	1.40
8.4	3.22	3.22	2.93	2.58	2.26	1.99	1.75	1.54	1.35	1.19
8.5	2.72	2.72	2.48	2.18	1.91	1.68	1.48	1.30	1.14	1.00
8.6	2.30	2.30	2.09	1.84	1.61	1.42	1.25	1.10	0.964	0.848
8.7	1.95	1.95	1.77	1.55	1.37	1.20	1.06	0.928	0.816	0.717
8.8	1.65	1.65	1.50	1.32	1.16	1.02	0.897	0.788	0.693	0.609
8.9	1.41	1.41	1.28	1.13	0.992	0.872	0.766	0.674	0.592	0.520
9.0	1.22	1.22	1.11	0.971	0.854	0.751	0.660	0.580	0.510	0.448

$$2.5CCC = 2.5 \times \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) \times MIN\left(2.85, 1.45 \cdot 10^{0.028(25-T)}\right)$$

Where: CCC = criteria continuous concentration
T = temperature in degrees Celsius (ºC)

pH-Dependent Effluent Limits for Ammonia
Criterion Maximum Concentration, Maximum 1-hour Average

pH	Ammonia Concentration Limit (mg N/*l*)
6.5	**32.6**
6.6	**31.3**
6.7	**29.8**
6.8	**28.0**
6.9	**26.2**
7.0	**24.1**
7.1	**21.9**
7.2	**19.7**
7.3	**17.5**
7.4	**15.3**
7.5	**13.3**
7.6	**11.4**
7.7	**9.64**
7.8	**8.11**
7.9	**6.77**
8.0	**5.62**
8.1	**4.64**
8.2	**3.83**
8.3	**3.15**
8.4	**2.59**
8.5	**2.14**
8.6	**1.77**
8.7	**1.47**
8.8	**1.23**
8.9	**1.04**
9.0	**0.885**

$$CMC_{salmonids\ present} = \left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}} \right)$$

Where: CMC = criteria maximum concentration

Hardness-Dependent Effluent Limits for Copper
(expressed as total recoverable metal)

Hardness (mg/*l* as $CaCO_3$)	Average Monthly (µg/*l*)	Ave. Daily (µg/*l*)	Hardness (mg/*l* as $CaCO_3$)	Average Monthly (µg/*l*)	Ave. Daily (µg/*l*)
<25	*Calc.*	*Calc.*	180	12	24
25	1.9	3.8	190	13	26
30	2.2	4.5	200	13	27
35	2.6	5.2	210	14	28
40	2.9	5.9	220	15	29
45	3.3	6.6	230	15	31
50	3.6	7.3	240	16	32
55	4.0	8.0	250	17	33
60	4.3	8.6	260	17	34
65	4.6	9.3	270	18	36
70	5.0	10	280	18	37
75	5.3	11	290	19	38
80	5.6	11	300	19	39
85	6.0	12	310	20	40
90	6.3	13	320	21	41
95	6.6	13	330	21	42
100	7.0	14	340	22	44
110	7.6	15	350	22	45
120	8.3	17	360	23	46
130	8.9	18	370	23	47
140	9.6	19	380	24	48
150	10	20	390	24	49
160	11	22	400	25	50
170	11	23	>400	25	50

$$CCC = e^{\{0.8545[\ln(hardness)]-1.702\}} \qquad AMEL = 1.55[\min(0.321CMC, 0.527CCC)]$$

$$CMC = e^{\{0.9422[\ln(hardness)]-1.700\}} \qquad MDEL = 3.11[\min(0.321CMC, 0.527CCC)]$$

Where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation
CCC = criteria continuous concentration
CMC = criteria maximum concentration

FACT SHEET

ORDER NO. R5-2002-0020
CITY OF COLUSA
COLUSA COUNTY
NPDES NO. CA0078999

SCOPE OF PERMIT

This renewed Order regulates the discharge of up to 0.90 million gallons per day (mgd), design average dry weather flow (ADWF), of effluent from the Colusa Wastewater Treatment Plant (WWTP). This Order includes effluent, groundwater, water supply, sludge, and surface water limitations, monitoring and reporting requirements, additional study requirements, and reopener provisions for effluent and groundwater constituents.

BACKGROUND INFORMATION

The City of Colusa (Discharger) provides sewerage service for the City of Colusa and serves a population of approximately 5,500.

The WWTP design average dry weather flow capacity is 0.90 mgd. The treatment system consists of preliminary comminution, wastewater stabilization ponds, overland flow, chlorination, and dechlorination with sulfur dioxide. Treated wastewater is discharged into an unnamed tributary to Powell Slough.

RECEIVING WATER BENEFICIAL USES

The receiving stream is an unnamed tributary to Powell Slough, which is tributary to the Colusa Trough and the Colusa Basin Drain. The Report of Waste Discharge describes the receiving stream as having "[n]o reliable dilution without further study". Based on the available information, the worst-case dilution is assumed to be zero to provide protection for the receiving water beneficial uses. The impact of assuming zero dilution within the receiving water is that discharge limitations based on acute and chronic toxicity are end-of-pipe limits with no allowance for dilution within the receiving water.

The beneficial uses of the unnamed tributary to Powell Slough are not individually identified in the Basin Plan. However, the Plan requires that the beneficial uses of any specifically identified water body apply to its tributary streams. Upon review of the flow conditions, habitat values, and beneficial uses of the unnamed tributary to Powell Slough the Board finds that the beneficial uses identified in the Basin Plan for the Colusa Basin Drain are applicable to the unnamed tributary to Powell Slough. The Basin Plan identifies the following beneficial uses for the Colusa Basin Drain: agricultural irrigation, agricultural stock watering, body contact water recreation, canoeing and rafting, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm fish migration habitat, warm spawning habitat, and wildlife habitat.

State Water Resources Control Board Resolution No. 88-63 "Sources of Drinking Water" provides that "All surface and ground waters of the State are considered to be suitable, or potentially suitable, for municipal or domestic water supply and should be so designated by the Regional Boards with the exception of:…2.b. The water is in systems designed or modified for the primary purpose of conveying or holding agricultural drainage waters…". The unnamed water bodies through which Colusa's wastewater flows were constructed for the purpose of conveying agricultural drainage waters. Powell Slough, although originally a natural water body, has been modified for the purpose of conveying agricultural drainage waters. Therefore, the unnamed water body and Powell Slough could likely meet the criteria for a municipal exemption under Resolution 88-63.

INFLUENT AND EFFLUENT LIMITATIONS

All mass limitations in Order No. R5-2002-0020 were calculated by multiplying the concentration limitation by the design flow and the appropriate unit conversion factors.

Flow—The WWTP was designed to provide equivalent-to-secondary level of treatment for up to its design flow of 0.90 mgd. The influent flow limit is therefore set at 0.90 mgd.

Total Coliform Organisms— Tertiary treatment is required to protect the beneficial uses of contact recreation and agricultural irrigation downstream of the discharge into the unnamed tributary to Powell Slough. The effluent limitation for total coliform organisms is intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of pathogen removal. The method of treatment is not prescribed by Order No. R5-2002-0020; however, wastewater must be treated to a level equivalent to that specified in Title 22 and in other recommendations by the California Department of Health Services.

Upstream of the discharge point, the unnamed tributary to Powell Slough is ephemeral. At times, the unnamed tributary to Powell Slough provides little or no dilution for wastewater effluent discharged from the WWTP. The California Code of Regulations, Title 22, contains criteria for the reuse or recycling of wastewater as an alternative to discharging to a receiving stream. Title 22 reclamation criteria were established to create minimum wastewater treatment standards to protect the public health when this water is reused for beneficial uses. The criteria are not directly applicable to streams that receive wastewater and the subsequent use of the combined stream/wastewater. This permit does not apply Title 22 standards to the discharge. However, in assessing the discharge standards necessary to protect the site-specific beneficial uses of the unnamed tributary to Powell Slough, Title 22 standards were compared to the level of treatment required to protect the public health when in contact with treated wastewater or when directly using undiluted effluent for food crop irrigation. Title 22 states that, for reuse as irrigation water for food crops and to protect for unrestricted contact recreation, it is necessary for wastewater to receive tertiary treatment resulting in coliform counts that do not exceed 2.2 MPN/100 m*l* as a 7-day median, 23 MPN/100 m*l* more than once in any 30 day period, and 240 MPN/100 m*l* ever.

The California Department of Health Services (DHS) has determined that a specific level of treatment is required for recycled water delivered in a dedicated pipe or canal. The unnamed tributary to Powell Slough, an ephemeral stream, is essentially the same as any other conveyance system (pipe or canal)

when sufficient upstream flows are not present for dilution. Therefore, the same level of treatment as that required for recycled water would be necessary to protect the public if the water is delivered in a dry streambed for the same uses. In a letter to Board staff, dated 8 April 1999, DHS concurred with the need
to protect beneficial uses and recommended that the level of treatment required under Title 22 of the California Code of Regulations for reclaimed water in a dedicated pipe or canal be applied to agricultural drains or streams where the water may be used or diverted for beneficial uses. Therefore, this permit includes tertiary effluent limitations based on protecting the beneficial uses of nonrestricted contact recreation and irrigation in the unnamed tributary to Powell Slough.

Turbidity— In addition to coliform testing, a turbidity effluent limitation has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The tertiary treatment process, or equivalent, is also capable of reliably meeting a reduced turbidity limitation of 2 NTU as a daily average, 5 NTU at least 95 percent of the time within a day, and 10 NTU at all times. Failure of the filtration system, such that virus removal is impaired, would normally result in increased particles in the effluent and higher effluent turbidity. Turbidity monitoring has a major advantage over coliform monitoring for evaluating filter performance, allowing immediate detection of filter failure and rapid corrective action. Coliform testing, by comparison, is not conducted continuously and requires several hours to days to identify high coliform concentrations.

BOD and TSS—40 Code of Federal Regulations (CFR), Section 133.102 contains regulations describing the minimum level of effluent quality—for biochemical oxygen demand (BOD) and total suspended solids (TSS)—attainable by secondary treatment.

From 1 February 2007 forward, the WWTP will be required to comply with effluent limitations appropriate for treatment systems providing tertiary or equivalent treatment. Effluent limitations for both BOD and TSS have been established at 10 mg/*l*, as a 30-day average, which is technically based on the capability of tertiary system. In addition, 40 CFR 133.102, in describing the minimum level of effluent quality attainable by secondary treatment, states that the 30-day average percent removal shall not be less than 85 percent. If 85 percent removal of BOD and TSS must be achieved by a secondary treatment plant, it must also be achieved by a tertiary (i.e., treatment beyond secondary level) treatment plant.

Settleable Solids—For inland surface waters, the Basin Plan states that "[w]ater shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses." Order No. R5-2002-0020 contains average monthly and maximum daily effluent limitations for settleable solids. The average monthly limitation is based on the method detection level for settleable solids of 0.1 m*l*/*l*. The maximum daily limitation was developed from the average monthly limitation using a statistical method based on the variability of existing data and the expected frequency of monitoring. Analysis of the past twelve months of settleable solids results (for days when the WWTP was discharging) yielded a coefficient of variability of 0.8. For analysis purposes, non-detect results were considered equal to one half of the detection level. This number and the required weekly monitoring resulted in a maximum daily effluent limitation of 0.2 m*l*/*l*.

Total Residual Chlorine—Chlorine is commonly used as a disinfection agent in the treatment of wastewater. The City of Colusa uses chlorine for disinfection at its WWTP. For dechlorination, the Discharger uses sulfur dioxide, which combines with chlorine, to render it relatively unreactive and thus remove it from the waste stream. Inadequate dechlorination may result in discharge of chlorine to the receiving stream. For chlorine, U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life. The recommended maximum one-hour average concentration for chlorine is 0.019 mg/*l* and the recommended maximum four-day average concentration is 0.011 mg/*l*. Effluent limitations for chlorine, based on these criteria, are included in Order No. R5-2002-0020.

Ammonia— Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrate, and denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification and denitrification processes to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream.

In water, un-ionized ammonia (NH_3) exists in equilibrium with the ammonium ion (NH_4^+). The toxicity of aqueous ammonia solutions to aquatic organisms is primarily attributable to the un-ionized ammonia form, with the ammonium ion being relatively less toxic. The relative concentrations of these two forms are pH- and temperature-dependent. Total ammonia refers to the sum of these two forms in aqueous solutions.

U.S. EPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life, for total ammonia, recommends acute (1-hour average) standards based on pH and chronic (30-day average) standards based on pH and temperature. It also recommends a maximum four-day average concentration. U.S. EPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia as not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. Because the receiving stream has a beneficial use of cold freshwater habitat, the recommended criteria for waters where salmonids are present were used.

U.S. EPA has presented the acute ammonia criteria in three ways: as equations, in a table, and in graphs that relate pH to ammonia concentrations. Attachment B shows the equation and table used for the 30-day average concentration criteria recommended for waters where fish early life stages are present. Attachment C shows the equation and table used for the 4-day average concentration criteria recommended for waters where fish early life stages are present. Attachment D shows the equation and table used for the 1-hour average concentration criteria recommended for waters where salmonid fish are present. A 30-day period is a reasonable representation of a calendar month; so, to conform to 40 CFR §122.45, the 30-day average criteria are set equal to average monthly limitations in Order No. R5-2002-0020.

pH—The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the "…pH shall not be depressed below 6.5 nor raised above 8.5." No reliable dilution is available in

the receiving stream, so the Order includes effluent limitations for pH at the Basin Plan objective values.

Toxicity—The Basin Plan states that "[a]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances." The Basin Plan requires that "[a]s a minimum, compliance with this objective…shall be evaluated with a 96-hour bioassay." Order No. R5-2002-0020 requires both acute and chronic toxicity monitoring to evaluate compliance with this water quality objective.

The ephemeral natures of the unnamed tributary to Powell Slough and Powell Slough mean that the designated beneficial uses must be protected, but that no credit for receiving water dilution is available. The use of a dilution series to evaluate compliance with the narrative toxicity objective contained in the Basin Plan is, therefore, inappropriate.

The Basin Plan further states that "…effluent limits based upon acute biotoxicity tests of effluents will be prescribed…". Effluent limitations for acute toxicity have been included in the Order.

EFFLUENT LIMITATIONS—REASONABLE POTENTIAL

The City of Colusa conducted monitoring for priority and non-priority pollutants. The analytical results of the two sampling events (6 February 1996 and 8 May 2000) were submitted to the Regional Board. Regional Board staff collected effluent samples (14 August 2001) that were analyzed for copper and volatile compounds. The results of these three sampling events were used in developing Order No.R5-2002-0020. All detectable results from these analyses are summarized in Table 1 (below). Effluent limitations are included in the Order to protect the beneficial uses of the receiving stream and to ensure that the discharge complies with the Basin Plan objective that toxic substances not be discharged in toxic amounts. All mass limitations in Order No. R5-2002-0020 were calculated by multiplying the concentration limitation by the design flow and the appropriate unit conversion factors.

Table 1—Colusa Wastewater Treatment Plant, Hardness (mg/*l*) *and Pollutant Sampling Detectable Results* (µg/*l*)

Constituent	6 Feb. 1996	8 May 2000	14 Aug. 2001	Projected MEC[1]	Comments
Hardness	--	50	180	N/A	Used for hardness-dependent criteria.
1,1,1-Trichloroethane	3.1	<5	<5	17.4	See discussion for ***1,1,1-Trichloroethane***

[1] The projected MEC (maximum effluent concentration) is determined by multiplying the observed MEC (the maximum detected concentration) by a factor that accounts for statistical variation. The multiplying factor is determined (for 99% confidence level and 99% probability basis) using the number of results available and the coefficient of variation (standard deviation divided by mean) of the sample results. The default coefficient of variation for data sets containing fewer than ten data points is 0.6. The multiplying factors used were: for a single sample, 13.2; for two samples, 7.4; for three samples, 5.6; for all constituents for which the source of the applicable water quality standard is the CTR or NTR, 1. Reasonable potential evaluation was based on the methods used in the SIP and the U.S. EPA Technical Support Document for Water Quality-Based Toxics Control [EPA/505/2-90-001].

Constituent	6 Feb. 1996	8 May 2000	14 Aug. 2001	Projected MEC[1]	Comments
Chloroform	<0.5	11.9[2]	46	258	See discussion for ***Chloroform*** below.
Dichlorobromomethane	<0.5	<5	14	14	See discussion for ***Dichlorobromomethane*** below.
Aluminum	--	386	--	5,095	See discussion for ***Aluminum*** below.
Barium	--	38	--	502	No applicable criteria.
Boron	--	643	--	8,488	No applicable criteria.
Copper	--	8	6.8	8	See discussion for ***Copper*** below.
Iron	--	293	--	3,868	See discussion for ***Iron*** below.
Manganese	--	106	--	1,399	No applicable criteria.
Mercury	--	0.034	--	0.034	See discussion for ***Mercury*** below.
Nickel	--	3	--	3	See discussion for ***Nickel*** below.
Zinc	--	22	--	22	See discussion for ***Zinc*** below.

[2] Invalid test result.

1,1,1-Trichloroethane—1, 1, 1-trichloroethane has been detected in the effluent. U.S. EPA has developed National Recommended Ambient Water Quality Criteria for the protection of aquatic life for 1,1,1-trichloroethane. The recommended lowest observed toxicity effect level for 1,1,1-trichloroethane is 18,000 µg/*l*. 1,1,1-trichloroethane was detected in the effluent at a concentration of 3.1 µg/*l*. Using the reasonable potential analysis procedure described in the first footnote to Table 1, the projected maximum effluent 1,1,1-trichloroethane concentration is 17.4 µg/*l*. The projected maximum effluent concentration is less than the water quality criterion; therefore, no effluent limitation for 1,1,1-trichloroethane is included in Order No. R5-2002-0020.

Chloroform—Chloroform has been detected in the effluent. U.S. EPA has developed National Recommended Ambient Water Quality Criteria for the protection of human health and welfare for chloroform. The one-in-a-million risk estimate criterion for waters that are not sources of drinking water, but from which aquatic organisms may be consumed is 470 µg/*l*. Chloroform was detected in the effluent at a concentration of 46 µg/*l*. Using the reasonable potential analysis procedure described in the first footnote to Table 1, the projected maximum effluent chloroform concentration is 258 µg/*l*. The projected maximum effluent concentration is less than the water quality criterion; therefore, no effluent limitation for chloroform is included in Order No. R5-2002-0020.

Dichlorobromomethane—Dichlorobromomethane has been detected in the effluent. U.S. EPA has developed National Recommended Ambient Water Quality Criteria for the protection of human health and welfare for dichlorobromomethane. The one-in-a-million risk estimate criterion for waters that are not sources of drinking water, but from which aquatic organisms may be consumed, is 46 µg/*l*. This value is included in the CTR. Dichlorobromomethane was detected in the effluent at a concentration of 14 µg/*l*. Using the reasonable potential analysis procedure described in the first footnote to Table 1, the projected maximum effluent dichlorobromomethane concentration is 14 µg/*l*. The projected maximum effluent concentration is less than the water quality criterion; therefore, no effluent limitation for dichlorobromomethane is included in Order No. R5-2002-0020.

Aluminum—According to information submitted by the Discharger in the Report of Waste Discharge, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the U.S. EPA National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum. Aluminum was detected in an effluent sample collected 8 May 2000 at a concentration of 386 µg/*l*. Using the reasonable potential analysis procedure described in the first footnote to Table 1, the projected maximum effluent aluminum concentration is 5,095 µg/*l*. The recommended continuous concentration (maximum four-day average concentration) is 87 µg/*l* and the recommended maximum concentration (maximum one-hour average concentration) is 750 µg/*l*. The measured and projected maximum effluent concentrations are greater than the water quality criteria; therefore, effluent limitations for aluminum are required. Order No. R5-2002-0020 includes maximum one-hour and four-day effluent limitations for aluminum.

In a letter dated 28 November 2001, the Discharger requested approval of a specific aluminum testing protocol based on discussion included in U.S. EPA's Ambient Water Quality Criteria for Aluminum—1988 [EPA 440/5-86-008]. In this document, U.S. EPA states that "[a]cid-soluble aluminum…is probably the best measurement at the present…"; however, U.S. EPA has not yet approved an acid-soluble test method for aluminum. The Discharger proposed modifying the analytical method by substituting an inductively coupled plasma (ICP)/mass spectrometry (MS) analysis for the ICP/atomic emission spectrometric (AES) analysis. Replacing the ICP/AES portion of the analytical procedure with ICP/MS would allow lower detection limits to be achieved. Based on U.S. EPA's discussion of aluminum analytical methods and the Discharger's request, Order No. R5-2002-0020 allows the use of the alternate aluminum testing protocol described above to meet monitoring requirements.

Copper— Based on analytical results of effluent samples collected by the Discharger and Regional Board staff (see table below), the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR standards for copper; therefore, effluent limitations for copper are included in the Order. U.S. EPA developed hardness-dependent Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for copper. The Ambient Water Quality Criteria for metals are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for copper in freshwater are 0.960 for both the acute and the chronic criteria. The effluent limitations for copper are presented in total recoverable concentrations, and are based on U.S. EPA's Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life as included in the CTR.

Source	Copper, Total (µg/*l*)	Hardness (mg/*l* as $CaCO_3$)	CCC (total)) (µg/*l*)	CMC (total) (µg/*l*)
RoWD (sample collected 8 May 2000)	8	50	5.2	7.3
RWQCB (sample collected 14 August 2001)	6.8	180	16	24

The State Board adopted the SIP on 2 March 2000 and amended it on 26 April 2000. The SIP includes methodology for setting effluent limitations for priority toxic pollutants included in the NTR and CTR. The method includes converting chronic (four-day) and acute (one-hour) aquatic life criteria to average

monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. Equations summarizing the conversion are shown below:

$$CCC = e^{\{0.8545[\ln(hardness)]-1.702\}} \qquad CMC = e^{\{0.9422[\ln(hardness)]-1.700\}}$$

$$AMEL = 1.55[\min(0.321CMC, 0.527CCC)] \qquad MDEL = 3.11[\min(0.321CMC, 0.527CCC)]$$

where: AMEL = average monthly effluent limitation
MDEL = maximum daily effluent limitation
CCC = criteria continuous concentration (four-day average)
CMC = criteria maximum concentration (one-hour average)

Order No. R5-2002-0020 includes maximum one-day average and one-month average hardness-dependent copper limitations.

Iron—Iron has been detected in the effluent. U.S. EPA has developed National Recommended Ambient Water Quality Criteria for the protection of freshwater aquatic life for iron. The recommended instantaneous maximum concentration of iron is 1,000 µg/*l*. Iron was detected in the effluent at a concentration of 293 µg/*l*. There is insufficient data to determine reasonable potential for the discharge to exceed the water quality criterion; therefore, no effluent limitation for iron is included in Order No. R5-2002-0020.

Mercury—Mercury has been detected in the effluent. U.S. EPA has developed National Recommended Ambient Water Quality Criteria for the protection of human health and welfare for mercury. The one-in-a-million risk estimate criterion for waters that are not sources of drinking water, but from which aquatic organisms may be consumed, is 0.051 µg/*l*. This criterion is included in the CTR. Mercury was detected in the effluent at a concentration of 0.034 µg/*l*. Using the reasonable potential analysis procedure described in the first footnote to Table 1, the projected maximum effluent mercury concentration is 0.034 µg/*l*. The projected maximum effluent concentration is less than the water quality criterion; therefore, no effluent limitation for mercury is included in Order No. R5-2002-0020.

Nickel—Nickel has been detected in the effluent. U.S. EPA has developed hardness-dependent National Recommended Ambient Water Quality Criteria for the protection of freshwater aquatic life for nickel. The Ambient Water Quality Criteria for metals are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for nickel in freshwater are 0.997 and 0.998 for the chronic and the acute criteria, respectively. These criteria are included in the CTR. Using the worst-case (lowest) measured effluent hardness (50 mg/*l* as $CaCO_3$) and converting the dissolved criteria to total recoverable criteria, the applicable chronic criterion is 29 µg/*l* and the acute criterion is 261 µg/*l*. Nickel has been detected in the effluent at a concentration of 3 µg/*l*. Using the reasonable potential analysis procedure described in the first footnote to Table 1, the projected maximum effluent nickel concentration is 3 µg/*l*. The projected maximum effluent concentration is less than the water quality criteria; therefore, no effluent limitation for nickel is included in Order No. R5-2002-0020.

Zinc—Zinc has been detected in the effluent. U.S. EPA has developed hardness-dependent National Recommended Ambient Water Quality Criteria for the protection of freshwater aquatic life for zinc. The Ambient Water Quality Criteria for metals are presented in dissolved concentrations. U.S. EPA recommends conversion factors to translate dissolved concentrations to total concentrations. The conversion factors for zinc in freshwater are 0.986 and 0.978 for the chronic and the acute criteria, respectively. These criteria are included in the CTR. Using the worst-case (lowest) measured effluent hardness (50 mg/*l* as $CaCO_3$) and converting the dissolved criteria to total recoverable criteria, the applicable chronic criterion is 67 µg/*l* and the acute criterion is 66 µg/*l*. Zinc has been detected in the effluent at a concentration of 22 µg/*l*. Using the reasonable potential analysis procedure described in the first footnote to Table 1, the projected maximum effluent nickel concentration is 22 µg/*l*. The projected maximum effluent concentration is less than the water quality criteria; therefore, no effluent limitation for zinc is included in Order No. R5-2002-0020.

General Effluent Limitation Information—

Selected 40 CFR §122.2 definitions:

'*Average monthly discharge limitation* means the highest allowable average of "daily discharges" over a calendar month, calculated as the sum of all "daily discharges" measured during a calendar month divided by the number of "daily discharges" measured during that month.

Average weekly discharge limitation means the highest allowable average of "daily discharges" over a calendar week, calculated as the sum of all "daily discharges" measured during a calendar week divided by the number of "daily discharges" measured during that week.

Continuous discharge means a "discharge" which occurs without interruption throughout the operating hours of the facility, except for infrequent shutdowns for maintenance, process changes, or other similar activities.

Daily discharge means the "discharge of a pollutant" measured during a calendar day or any 24-hour period that reasonable represents a calendar day for purposes of sampling. For pollutants with limitations expressed in units of mass, the "daily discharge" is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the "daily discharge" is calculated as the average measurement of the pollutant over the day.

Maximum daily discharge limitation means the highest allowable "daily discharge".'

The SIP contains similar definitions. These definitions were used in the development of Order No. R5-2002-0020. Alternate limitation period terms were used in the permit for the sake of clarity. Alternates are shown in the following table:

Term Used in Permit	SIP/40 CFR 122.2 Term
Average monthly	Average monthly discharge limitation. 30-day

Term Used in Permit	SIP/40 CFR 122.2 Term
	averages may have been converted to monthly averages to conform with 40 CFR §122.45 (see below)
Average daily	Maximum daily discharge limitation. Since the daily discharge for limitations expressed in concentrations is defined as the average measurement of the pollutant over the day, the term 'Average Daily' was used in the Order.

40 CFR §122.45 states that:

(1) "In the case of POTWs, permit effluent limitations…shall be calculated based on design flow."

(2) "For continuous discharges all permit effluent limitations…shall unless impracticable be stated as…[a]verage weekly and average monthly discharge limitations for POTWs."

(3) "All pollutants limited in permits shall have limitations…expressed in terms of mass except…[f]or pH, temperature, radiation, or other pollutants which cannot appropriately be expressed by mass…Pollutants limited in terms of mass additionally may be limited in terms of other units of measurement, and the permit shall require the permittee to comply with both limitations."

RECEIVING WATER LIMITATIONS AND MONITORING

Fecal coliform—By the tributary rule, the unnamed tributary to Powell Slough has been designated as having the beneficial use of contact recreation (REC-1). For water bodies designated as having REC-1 as a beneficial use, the Basin Plan includes a water quality objective limiting the "…fecal coliform concentration based on a minimum of not less than five samples for any 30-day period…" to a maximum geometric mean of 200 MPN/100 ml. The objective also states that "…[no] more than ten percent of the total number of samples taken during any 30-day period [shall] exceed 400/100 ml." This objective is included in the Order as a receiving water limitation.

Dissolved Oxygen—By the tributary rule, the unnamed tributary to Powell Slough has been designated as having the beneficial use of cold freshwater aquatic habitat (COLD). In general, the presence or absence of cold water species has not been documented for the unnamed tributary or Powell Slough; however, hydraulic continuity of the unnamed tributary to Powell Slough with Powell Slough and the Colusa Basin Drain has been observed by Regional Board staff.

For water bodies designated as having COLD as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/*l* of dissolved oxygen. Since, by the tributary rule, the beneficial use of COLD does apply to the unnamed tributary to Powell Slough, a receiving water limitation of 7.0 mg/l for dissolved oxygen was included in the Order.

For surface water bodies outside of the Delta, the Basin Plan includes the water quality objective that "…the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation." This objective was included as a receiving water limitation in the Order.

pH—For all surface water bodies in the Sacramento River and San Joaquin River basins, the Basin Plan includes water quality objectives stating that "[t]he pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses." By the tributary rule, the unnamed tributary to Powell Slough has the beneficial uses of both COLD and WARM (warm freshwater habitat); therefore, the Order includes receiving water limitations for both pH range and pH change.

The Basin Plan allows an appropriate averaging period for pH change in the receiving stream. Since there is no technical information available that indicates that aquatic organisms are adversely affected by shifts in pH within the 6.5 to 8.5 range, an averaging period is considered appropriate and a monthly averaging period for determining compliance with the 0.5 receiving water pH limitation is included in the Order.

Temperature—By the tributary rule, the unnamed tributary to Powell Slough has the beneficial uses of both COLD and WARM. The Basin Plan includes the objective that "[a]t no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5ºF above natural receiving water temperature." The Order includes a receiving water limitation based on this objective.

Turbidity—The Basin Plan includes the following objective: "Increases in turbidity attributable to controllable water quality factors shall not exceed the following limits:

- Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.
- Where natural turbidity is between 5 and 10 NTUs, increases shall not exceed 20 percent.
- Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTU.
- Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent."

The Basin Plan allows an appropriate averaging period for turbidity increases in the receiving stream. The turbidity objective in the Basin Plan is based on antidegradation and not on protection of aquatic life. The effluent limitations in Order No. R5-2002-0020 are the best practicable treatment levels available from a tertiary treatment system. An averaging period for low turbidity levels will not result in degradation of beneficial uses of the receiving stream. Therefore, when the discharged wastewater has been treated to a tertiary level, an averaging period of one month may be used in determining compliance with the 0 to 5 NTU background turbidity increase limitation.

Ammonia and Chlorine—U.S. EPA has developed Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia and for chlorine. The Order contains effluent limitations for ammonia and for chlorine equal to the Ambient Water Quality Criteria. Compliance with the effluent

limitations for ammonia and for chlorine means that the discharge cannot cause an exceedance of the criteria in the receiving stream; in other words, the limitations are fully protective of water quality. Therefore, no receiving water ammonia or chlorine limitations are included in the Order.

Narrative Limitations—Receiving Water Limitations 2 (biostimulatory substances), 3 (color), 5 (floating material), 6 (oil and grease), 8 (radioactivity), 9 (settleable material), 10 (tastes and odors), and 12 (toxicity) are based on narrative Basin Plan objectives. The objectives are located in Chapter III: Water Quality Objectives, under the Water Quality Objectives for Inland Surface Waters heading.

GROUNDWATER BENEFICIAL USES

In allowing a discharge, the Board must comply with CWC Section 13263 in setting appropriate conditions. The Board is required, relative to the groundwater that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential for that purpose. The Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC Section 13263(b)) but must consider other waste discharges and factors that affect that capacity. The Basin Plan establishes the beneficial uses for area groundwater as municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply. Procedures for application of water quality objectives to protect these uses, and the process for and factors to consider in allocating waste assimilation capacity, are set forth in the Basin Plan.

The antidegradation directives of CWC Section 13000 require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." Waters can be of high quality for some constituents or beneficial uses and not others. Policies and procedures for complying with this directive are set forth in the Basin Plan (including by reference State Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," commonly referred to for convenience by Resolution 68-16 or as the "Antidegradation" Policy).

Resolution 68-16 establishes essentially a two-step process to comply with the policy. The first step is if a discharge will degrade high quality water, the discharge may be allowed if any change in water quality (a) will be consistent with maximum benefit to the people of the State, (b) will not unreasonably affect present and anticipated beneficial uses of such water, and (c) will not result in water quality less than that prescribed in State policies (*e.g.*, water quality objectives in the Basin Plan). The second step is that any activities that result in discharges to such high quality waters are required to use the best practicable treatment or control (BPTC) of the discharge necessary to avoid a pollution or nuisance and to maintain the highest water quality consistent with the maximum benefit to the people of the State.

In authorizing waste discharges, the Board evaluates each case to determine whether degradation should be allowed and then either proscribes or limits the degradation on a constituent-by-constituent basis to that which complies with Resolution 68-16. If allowing water quality degradation, the Board must first find that the degradation is at least balanced by the benefit to the public of the activity creating the discharge and that the discharge undergoes BPTC. To facilitate this process and protect their interests, dischargers

must provide material and relevant technical information that fully characterizes:

- site-specific hydrogeologic conditions
- background quality of the receiving water
- background quality of other waters that may be affected by the discharge
- all waste constituents to be discharged
- waste treatment and control measures
- how treatment and control measures qualify as BPTC
- the extent that each waste constituent after BPTC will degrade the quality of the groundwater
- how the expected degradation compares to water quality objectives
- how the expected degradation is consistent with maximum public benefit

Water quality objectives (objectives) define the least stringent criteria that could apply as water quality limitations for groundwater at this location, except where natural background quality already exceeds the objective. When the Board adopts objectives in the Basin Plan, it is required to comply with CWC Section 13241, including consideration of economics. Section 13241 does not indicate how the Board is to consider economics in its decisions or emphasize any one of the Section 13241 factors over another. Regardless, Section 13241 applies to the imposition of requirements only when the Board is considering whether to impose groundwater limitations more stringent than an objective (see SWRCB Order WQ 95-4, slip op. page 5). Even where a Basin Plan narrative objective exists, and the Board adopts a numeric effluent limitation in waste discharge requirements to implement the narrative objective, the Board is not required to consider the factors in CWC Section 13241.

The objectives in the Basin Plan occur in numeric and narrative form. In issuing waste discharge requirements, the Board must implement the Basin Plan, including all its objectives, but need not allow degradation to the objectives (California Water Code Section 13263). Narrative objectives generally specify that groundwater shall not contain constituents (e.g., chemicals, pesticides, toxic substances, taste- and odor-producing substances) in concentrations that adversely affect beneficial uses. For some narrative objectives, the Basin Plan establishes minimum numerical objectives. Basin Plan numerical objectives are the concentration thresholds necessary for the reasonable protection of beneficial uses of the water. For example, the narrative objective for chemical constituents specifies that, as a minimum, groundwaters designated for municipal supply shall not exceed maximum contaminant levels (MCLs). Similar objectives exist for radioactivity and pesticides. Numeric objectives based on these MCLs are in Title 22, Sections 64431 (Inorganic Chemicals); 64431 (Fluoride); 64443 (Radioactivity); 64444 (Organic Chemicals); and 64449 (Secondary MCLs – Consumer Acceptance Limits). Numeric objectives in the Basin Plan intended to assure protection of municipal supply also include total coliform of less than 2.2/100 m*l*.

GROUNDWATER LIMITATIONS AND MONITORING

Electrical Conductivity—The beneficial uses of groundwater include municipal and domestic water supply (MUN). The California Department of Health Services has listed a Secondary Maximum

Contaminant Level for specific conductance. There is potential for the wastewater percolating to groundwater to cause or contribute to elevated specific conductance in the groundwater. Order No. R5-2002-0020 requires monitoring of electrical conductivity in the groundwater.

Total Coliform Organisms—The Basin Plan includes the following water quality objective: "In ground waters used for domestic or municipal supply (MUN) the most probable number of coliform organisms over any seven-day period shall be less than 2.2/100 ml." The Order requires monitoring of total coliform organisms in the groundwater.

Nitrogen—Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrate, and denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. Wastewater treatment plants commonly use nitrification and denitrification processes to remove ammonia from the waste stream. The beneficial uses of groundwater include municipal and domestic water supply (MUN).

For nitrogen, California Department of Health Services has developed a Primary Maximum Contaminant Level (MCL) of 10 mg/*l*. The conversion of ammonia to nitrates presents a reasonable potential for the wastewater percolating to groundwater to cause the groundwater to exceed the Primary Maximum Contaminant Level for nitrogen. Denitrification reduces the potential for the Discharger to cause an exceedance of the Primary MCL for nitrogen. Order No. R5-2002-0020 requires continued monitoring of the groundwater for nitrogen.

pH— The ponds at the City of Colusa WWTP are unlined, so wastewater in the process of being treated may percolate to groundwater. The Basin Plan includes a water quality objective for groundwater that "[g]round waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses." The beneficial uses of groundwater include municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO).

U.S. EPA has a Secondary Maximum Contaminant Level (or Secondary Standard) for drinking water pH of 6.5 to 8.5 units. The noticeable effects of pH outside of the Secondary Standard range include (a) for a low pH: bitter metallic taste; corrosion and (b) for a high pH: slippery feel; soda taste; deposits [U.S. EPA, Secondary Drinking Water Regulations: Guidance for Nuisance Chemicals, http://www.epa.gov/safewater].

Potential corrosion and deposits caused by a pH outside of the 6.5 to 8.5 range would adversely affect the beneficial use of industrial process supply, which is defined in the Basin Plan as: "Uses of water for industrial activities that depend primarily on water quality."

Low pH values cause metals to dissolve, allowing them to percolate into groundwater. Elevated metal concentrations in the groundwater would violate the groundwater toxicity objective included in the Basin Plan. Monitoring for groundwater pH is required by Order No. R5-2002-0020.

POND LIMITATIONS AND MONITORING

Dissolved Oxygen—Anaerobic (lacking in oxygen) processes tend to produce aesthetically undesirable odors. To minimize production of undesirable odors, the Discharger is required to maintain some (at least 1.0 mg/*l*) dissolved oxygen in the upper one foot of the ponds.

pH—The ponds at the City of Colusa WWTP are unlined, so wastewater in the process of being treated may percolate to groundwater. The Basin Plan includes a water quality objective for groundwater that "[g]round waters shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses." The beneficial uses of groundwater include municipal and domestic water supply (MUN), agricultural supply (AGR), industrial service supply (IND), and industrial process supply (PRO).

U.S. EPA has a Secondary Maximum Contaminant Level (or Secondary Standard) for drinking water pH of 6.5 to 8.5 units. The noticeable effects of pH outside of the Secondary Standard range include (a) for a low pH: bitter metallic taste; corrosion and (b) for a high pH: slippery feel; soda taste; deposits [U.S. EPA, Secondary Drinking Water Regulations: Guidance for Nuisance Chemicals, http://www.epa.gov/safewater]. A pond pH limitation range of 6.5 to 8.5 helps to ensure that the Discharger's wastewater treatment activities do not cause the groundwater taste and odor objective to be violated.

Potential corrosion and deposits caused by a pH outside of the 6.5 to 8.5 range would adversely affect the beneficial use of industrial process supply, which is defined in the Basin Plan as: "Uses of water for industrial activities that depend primarily on water quality."

Low pH values cause metals to dissolve, allowing them to percolate into groundwater. Many metals are priority toxic pollutants. Elevated metal concentrations in the groundwater would violate the groundwater toxicity objective included in the Basin Plan.

Freeboard—The Order contains a limitation for pond freeboard. Pond levees can fail for a variety of reasons, typically, a lack of maintenance or overtopping due to wave action. The Order requires a minimum pond freeboard of two feet be maintained to prevent overtopping.