

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2002-0095

NPDES NO. CA0081612

WASTE DISCHARGE REQUIREMENTS  
FOR  
NEVADA COUNTY SANITATION DISTRICT NO. 1, LAKE OF THE PINES  
WASTEWATER TREATMENT PLANT  
NEVADA COUNTY

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

*BACKGROUND*

1. The Nevada County Sanitation District No. 1 (hereafter Discharger) submitted a Report of Waste Discharge, dated 12 November 1999, and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES) for the Lake of the Pines domestic Wastewater Treatment Plant (WWTP).
2. The Discharger owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to the community of Lake of the Pines with approximately 1,800 residences. The treatment plant is in Sections 27 and 28, T14N, R8E, MDB&M, as shown on Attachment A, a part of this Order. Treated municipal wastewater is discharged to Magnolia Creek, a water of the United States and tributary to the Bear River at the point, latitude 39° 02' 00" (degree, minute, second) and longitude 121° 05' 01".
3. The treatment system consists of an unlined aeration pond, two unlined settling ponds, three unlined storage ponds, coagulation and flocculation, sand filtration, chlorination and dechlorination. Currently, the tertiary treatment processes, chemical coagulation, flocculation, sand filtration and chlorination/dechlorination processes are used only during wet weather periods with effluent disposal to Magnolia Creek. Spray irrigation to 55 acres of hilly pasture owned by the Discharger of chlorinated secondary effluent occurs from May through October and dry winter periods. All tail water is returned to the spray fields or treatment facilities. The Discharger maximizes the use of land disposal.
4. The Report of Waste Discharge and Discharger Self Monitoring Reports describe the wastewater discharge as follows:

For the tertiary discharge to Magnolia Creek:

Design Flow Rate (average dry weather flow)	0.72	mgd
Average Dry Daily Flow Rate	0.446	mgd
Maximum Daily Flow Rate	2.0	mgd
Average Daily Biochemical Oxygen Demand (BOD) <sup>1</sup>	8.3	mg/l
Maximum Daily BOD	11.5	mg/l
Average Daily Total Suspended Solids (TSS)	6.5	mg/l
Maximum Daily TSS	8.8	mg/l

For the secondary discharge to irrigation fields:

Design Flow Rate (average dry weather flow)	0.72	mgd
Average Daily Flow Rate	0.446	mgd
Maximum Daily Flow Rate	2.0	mgd
Average Daily Biochemical Oxygen Demand (BOD) <sup>1</sup>	9.3	mg/l
Maximum Daily BOD	10.67	mg/l
Average Daily Total Suspended Solids (TSS)	15.4	mg/l
Maximum Daily TSS	17.8	mg/l

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<sup>1</sup> 5-day, 20°C biochemical oxygen demand

5. The Regional 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 (SWRCB) 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 at page II-2.00 states: “Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 . The beneficial uses of any specifically identified water body generally apply to its tributary streams”. Magnolia Creek is in the Bear River hydrologic area (515.1) in the Sacramento Hydrologic Basin. The Basin Plan does not specifically identify beneficial uses for Magnolia Creek. Magnolia Creek is tributary to the Bear River. The Bear River is the first body of water downstream of Magnolia Creek for which the Basin Plan has identified existing and potential beneficial uses. The beneficial uses of the Bear River, as identified in Table II-1 of the Basin Plan, are municipal and domestic supply; agricultural irrigation, agricultural stock watering, hydropower generation, body contact water recreation, canoeing and rafting, non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, potential warm fish migration habitat, potential cold fish migration habitat, potential warm spawning habitat, potential cold spawning habitat, and wildlife habitat. Other beneficial uses identified in the Basin Plan apply to Magnolia Creek, including groundwater recharge and freshwater replenishment. 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 with respect to disposal of wastewaters states that “...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.”

Upon review of the flow conditions, habitat values, and beneficial uses of Magnolia Creek, and based on hydraulic continuity, aquatic life migration, and existing and potential water rights, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Bear River, are applicable to Magnolia Creek.

8. The Basin Plan states that “*Water Bodies within the basins that do not have beneficial uses designated in Table II-1 are assigned MUN designations in accordance with the provisions of State Water Board Resolution No. 88-63 which is, by reference, a part of this Basin Plan.*” 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...*” certain exceptions. In addition to application of domestic and municipal beneficial uses of Magnolia Creek by the tributary rule, the MUN designation is applied in accordance with Resolution No. 88-63.
9. The Regional Board finds that the beneficial uses identified in the Basin Plan for the Bear River are applicable to Magnolia Creek based upon the following:

- a. *Municipal and Domestic Supply*

The SWRCB has recorded water rights for domestic uses, irrigation uses, recreational uses, and fish and wildlife protection and/or enhancement along Magnolia Creek downstream of the discharge. The Final Subsequent EIR (FSEIR), July 1984, for the wastewater treatment facility, documents 15 dwellings within 500 feet of Magnolia Creek. Camp Far West Reservoir, about 17 miles below the discharge on the Bear River, is used for domestic supply and recreation on a year-round basis, according to the FSEIR. Riparian domestic uses, for landowners along streams and rivers, may also exist and may not be recorded as water rights with the SWRCB.

Magnolia Creek is a low-flow stream and may provide groundwater recharge during periods of low flow. Groundwater is a designated source of drinking and irrigation water.

- b. *Water Contact and Noncontact Recreation (including canoeing, rafting, and aesthetic enjoyment)*

The Regional Board finds that the discharge flows through areas where there is limited public access to Magnolia Creek and the Bear River; however, exclusion of adjoining property owners and the public is unrealistic. One documented property owner on Magnolia Creek has a reservoir that is used for irrigation, contact recreation and fishing.

- c. *Warm and Cold Freshwater Habitats (including preservation or enhancement of fish and invertebrates) and Wildlife Habitat*

Magnolia Creek flows to the Bear River. The Basin Plan (Table II-1) designates the Bear River as being both a cold and warm freshwater habitat. Pursuant to the Basin Plan tributary

rule, the warm and cold freshwater habitat designations applied to the Bear River also apply to Magnolia Creek. The habitat designation for Magnolia Creek is appropriate since the California Department of Fish and Game has recorded the presence of trout in these waters near the Bear River. 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. Groundwater provides a source of municipal and irrigation water supply.

e. *Freshwater Replenishment*

When water is present in Magnolia Creek, there is hydraulic continuity between these waters and the Bear River. Magnolia Creek contributes to the quantity and impacts the quality of the water in the Bear River.

The Regional Board also finds that, based on the available information and on the Discharger's application, that Magnolia Creek, absent the discharge from the wastewater treatment plant, is a low-flow stream. The low-flow nature of Magnolia Creek and the lack of receiving water quality data mean that the designated beneficial uses must be protected, but that no credit for receiving water assimilative capacity is available. Although the discharge, at times, maintains the aquatic habitat, constituents may not be discharged that may cause harm to aquatic life. Flows within Magnolia Creek help support cold-water aquatic life. The lack of significant 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*

10. 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.
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. 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 sufficient to calculate effluent limitations for those constituents; and
- c. allow the Regional 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 State 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.

- 12. 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) (EPCRA) 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.
- 13. 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 Regional 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, nitrate plus nitrite, and nitrite. Effluent limitations for these constituents are included in this Order.
- 14. 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, without benefit of dilution, for chlorine since Magnolia Creek is a low-flow stream. The Discharger has the ability

with proper operation of the wastewater treatment system, to dechlorinate the discharge and comply with the chlorine limitations.

15. Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrogen gas, which is then released to the atmosphere. 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. The Basin Plan prohibits the discharge of toxic materials in toxic concentrations. Nitrite and nitrate are known to cause adverse health effects in humans. The Basin Plan prohibits the discharge of chemical constituents in concentrations that adversely affect beneficial uses. Domestic water supply is a beneficial use of Magnolia Creek and the Bear River. U.S. EPA has developed Drinking Water Standards for the protection of human health for nitrite and nitrate and Ambient Water Quality Criteria for ammonia. The discharge from the Lake of the Pines Wastewater Treatment Plant has a reasonable potential to cause or contribute to an in-stream excursion above water quality standards for ammonia, nitrite, and nitrate. Effluent limitations for ammonia, nitrite, and nitrate are included in this Order to assure the treatment process adequately nitrifies and denitrifies the waste stream to protect the beneficial uses of the receiving stream and to prevent aquatic toxicity. The system may not be capable of meeting the ammonia, nitrite and nitrate limitations with physical or operational modifications, therefore, a compliance schedule has been allowed for meeting the more stringent limitations.
16. 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. Aluminum was detected in an effluent sample collected 6 April 2001 at a concentration of 820 µg/l. U.S. EPA developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum. 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. 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.
17. The beneficial uses of Magnolia Creek and the Bear River include contact recreation uses and irrigation. To protect these beneficial uses, the Regional 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,

schoolyards, 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 ml as a 7-day median. Title 22 is not directly applicable to surface waters; however, the Regional Board finds that it is appropriate to apply DHS's reclamation criteria because Magnolia Creek and the Bear River 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 contact recreation or 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 Discharger currently maximizes the use of land disposal and discharges to Magnolia Creek during the winter flows. The existing permit limits the discharge to Magnolia Creek from November to April. This permit eliminates the seasonal limitations of the discharge. The seasonal discharge limitations are not necessary since the Discharger is required to treat the effluent to tertiary level treatment that protects all the beneficial uses of Magnolia Creek and the Bear River.

The treatment system currently treats wastewater to a tertiary level when discharging to surface waters. The discharge limitations in the current permit establish coliform limits at 2.2 MPN/100ml as a 30-day median. The recommendation from DHS for the level of coliform produced by a tertiary wastewater system is 2.2 MPN/100ml as a 7-day median. A turbidity limitation has also been added to the permit, based on the capabilities a properly operated tertiary system. The BOD and TSS levels have been established at 15 mg/l, as monthly averages, in the existing permit. The BOD and TSS limitations have not been changed. The system may not be capable of meeting the 7-day median coliform and turbidity limitations without physical or operational modifications, therefore, a compliance time schedule has been allowed for meeting the more stringent limitations.

18. This Order requires the Discharger to comply with bacteria and turbidity requirements to achieve tertiary treatment of the wastewater and revises tertiary treatment requirements in the previous Order. The requirements for bacteria and turbidity are not based on existing water quality objectives in the Basin Plan. The Regional Board, therefore, is required to consider the provisions of Water Code section 13241, including economics, in imposing the bacteria and turbidity requirements. The Discharger is currently providing tertiary treatment, but compliance with revised requirements in this Order will require some improvements to the existing system. The Discharger submitted cost estimates to comply with the Order that ranged from \$5.2 to \$6.5

million and included costs for constructing an entirely new treatment plant. The costs for the relatively minor changes to the existing system to attain the revised tertiary treatment standards are significantly less than the costs estimates submitted by the Discharger. The Board considers the improvements as necessary to protect the beneficial uses of the waters of the state. Significant modifications or a new treatment plant may be necessary to comply with new requirements for ammonia, nitrate, and nitrite contained in this Order. The requirements for ammonia, nitrate, and nitrite are based on existing water quality objectives in the Basin Plan. The Board is not required to consider the provisions of Water Code section 13241, including economics, in imposing permit requirements to implement existing water quality objectives.

#### *GROUNDWATER*

19. The beneficial uses of the underlying ground water, as identified in the Basin Plan, are municipal and domestic, industrial service, industrial process, and agricultural supply.
20. The Basin Plan contains water quality objectives to protect the beneficial uses of groundwater including numeric, narrative, chemical toxicity and taste and odor objectives. 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.
21. SWRCB Resolution No. 68-16 (hereafter Resolution 68-16) requires the Regional 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 Regional 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.
22. Domestic wastewater contains constituents such as total dissolved solids (TDS), specific conductivity, pathogens, nitrates, organics, metals and oxygen demanding substances (BOD). The unlined ponds and disposal fields may percolate, and may result in an increase in the concentration of these constituents 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.

23. 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 must, at a minimum, require a complete assessment of groundwater impacts including the vertical and lateral extent of degradation, an assessment of all wastewater-related constituents which may have migrated to groundwater, 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 No. 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 beyond the quantified level. If groundwater quality has been or may be degraded by the discharge, this Order may be reopened and specific numeric limitations established consistent with Resolution 68-16 and the Basin Plan.
24. 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.
25. 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 has been developed to monitor compliance with the groundwater limitations required by this Order. The attached Monitoring and Reporting Program is necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges waste subject to this Order.

#### *LAND DISCHARGE SPECIFICATIONS*

26. The Discharger utilizes ponds for the treatment and storage of wastewater. Land Discharge Specifications have been included in this permit to assure that the pond does not overflow or cause a nuisance. Nuisance conditions from ponds 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 pond.
27. The Discharger maximizes disposal of treated wastewater by spray irrigation. Land Discharge Specifications have been included in this permit to assure that nuisance conditions are minimized. This permit requires a full tailwater return system. These requirements remove the seasonal limit of discharging tertiary treated effluent to Magnolia Creek only from November to April.
28. Ponds levees can fail, typically, a lack of maintenance or overtopping due to wave action. This permit requires a minimum pond freeboard be maintained to prevent overtopping.

#### *GENERAL*

29. 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.
30. 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 No. R5-2002-0095 is issued pursuant to California Water Code Section 13267 and is necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges the waste subject to

this Order.

31. Monitoring and Reporting Program No. R5-2002-0095, Attachments A through C, and the Fact Sheet, are a part of this Order.
32. This discharge was previously regulated by Waste Discharge Requirements in Order No. 95-114, adopted by the Regional Board on 26 May 1995.
33. U.S. EPA and the Regional Board have classified this discharge as a minor discharge.
34. 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.
35. 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 21000, *et seq.*), requiring preparation of an environmental impact report or negative declaration in accordance with Section 13389 of the California Water Code.
36. The Regional 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.
37. The Regional 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.
38. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
39. 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.

**IT IS HEREBY ORDERED** that Order No. 95-114 is rescinded and the Nevada County Sanitation District No. 1, Lake of the Pines Wastewater Treatment Plant, 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 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 Discharger shall only discharge to surface waters when necessary due to wet weather and when flow exists in Magnolia Creek until the required full tertiary treatment system is complete and operational.

**B. Effluent Limitations:**

1. Effluent discharge to Magnolia Creek shall not exceed the following limitations:

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Median Monthl</u> <u>y</u>	<u>Average Weekly</u>	<u>Average Daily</u>	<u>Daily Maximum</u>
BOD <sup>1</sup>	mg/l	15 <sup>2</sup>	--	20 <sup>2</sup>	30 <sup>2</sup>	--
	lbs/day <sup>3</sup>	90		120	180	--
Total Suspended Solids	mg/l	15 <sup>2</sup>	--	20 <sup>2</sup>	40 <sup>2</sup>	--
	lbs/day <sup>3</sup>	90		120	240	--
Settleable Solids	ml/l	0.1	--	--	0.2	--
Total Coliform Organisms	MPN/100 ml	--	2.2	--	--	23

<sup>1</sup> 5-day, 20°C biochemical oxygen demand (BOD)

<sup>2</sup> To be ascertained by a 24-hour composite

<sup>3</sup> Based upon a design treatment capacity of 0.72 mgd ( $x \text{ mg/l} \times 8.345 \times 0.72 \text{ mgd} = y \text{ lbs/day}$ )

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average 4-Day</u>	<u>Average Daily</u>	<u>Average 1-Hour</u>
Total Residual Chlorine	mg/l lbs/day <sup>1</sup>	--	0.01 0.06	--	0.02 0.12
Ammonia (as N)	mg/l lbs/day <sup>2</sup>	Attachment B		--	Attachment C
Nitrate + Nitrite	mg/l	10	--	--	--

<sup>1</sup> Based upon a design treatment capacity of 0.72 mgd ( $x \text{ mg/l} \times 8.345 \times 0.72 \text{ mgd} = y \text{ lbs/day}$ )

<sup>2</sup> The mass limit (lb/day) for ammonia shall be equal to the concentration limit (from Attachments) multiplied by the design flow of 0.72 mgd and the unit conversion factor of 8.345 (see footnote 1 for equation).

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 LAKE OF THE PINES WASTEWATER TREATMENT PLANT  
 NEVADA COUNTY

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Average 4-Day</u>	<u>Average Daily</u>	<u>Average 1-Hour</u>
(as N)	lbs/day <sup>1</sup>	60	--	--	--
Nitrite	mg/l	1	--	--	--
(as N)	lbs/day <sup>1</sup>	6	--	--	--
Aluminum	μg/l	--	87	--	750
	lbs/day <sup>1</sup>	--	0.522	--	4.5

2. In addition to the limitations above, the effluent discharge to Magnolia Creek shall not exceed the following limitations (from **30 April 2007** forward):

<u>Constituents</u>	<u>Units</u>	<u>Average Monthl</u>	<u>Average Weekly</u>	<u>7-Day Median</u>	<u>Average Daily</u>	<u>Instantaneous Maximum</u>
		<u>Y</u>				
Total Coliform Organisms	MPN/100 m/	--	--	2.2	--	23 <sup>1</sup>
Turbidity	NTU	--	--	--	2	5 <sup>2</sup>

<sup>1</sup> The total coliform organisms concentration shall not exceed 23 MPN/100 m/ more than once in any 30-day period. No sample shall exceed a concentration of 240 MPN/100 m/.

<sup>2</sup> 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.

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).
4. The discharge shall not have a pH less than 6.5 nor greater than 8.5.
5. The average dry weather discharge flow shall not exceed 0.72 million gallons per day.
6. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

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

**C. 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.

**D. 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 Magnolia Creek and downstream waters:

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 ml or cause more than 10 percent of total samples taken during any 30-day period to exceed 400 MPN/100 ml.
2. Biostimulatory substances that 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 95<sup>th</sup> 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 (including coagulation), 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 Regional 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.

**E. Groundwater Limitation:**

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

groundwater:

1. Adversely impact beneficial uses or exceed water quality objectives.
2. Any constituent concentration, when compared with background, shall not be incrementally increased beyond the current concentration.

**F. Discharge Specifications (Ponds):**

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 Discharge Specification 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 9.0.
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. 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) for all ponds.

**G. Discharge Specifications (Spray Irrigation):**

1. Effluent to the irrigation fields shall not exceed the following limitations:

<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Median Monthl</u>	<u>Average Weekly</u>	<u>Maximum Daily</u>
			<u>Y</u>		
BOD <sup>1</sup>	mg/l	30 <sup>2</sup>	--	--	60
	lbs/day <sup>3</sup>	180			360
Total Suspended	mg/l	30 <sup>2</sup>	--	--	60

<sup>1</sup> 5-day, 20°C biochemical oxygen demand (BOD)

<sup>2</sup> To be ascertained by a 24-hour composite

<sup>3</sup> Based upon a design treatment capacity of 0.72 mgd ( $x \text{ mg/l} \times 8.345 \times 0.72 \text{ mgd} = y \text{ lbs/day}$ )



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<u>Constituents</u>	<u>Units</u>	<u>Average Monthly</u>	<u>Median Monthl y</u>	<u>Average Weekly</u>	<u>Maximum Daily</u>
Solids	lbs/day <sup>3</sup>	180			360
Total Coliform Organisms	MPN/100 ml	--	23	--	230

2. The discharge shall be distributed uniformly on adequate acreage in compliance with the Discharge Specifications. All tail water must be returned to the spray fields or treatment facilities.
3. Hydraulic loading of wastewater shall be at reasonable agronomic rates designed to minimize the percolation of process wastewater below the root zone (i.e., deep percolation).
4. Public contact with effluent shall be precluded through such means as fences, signs, and other acceptable alternatives.
5. Areas irrigated with effluent shall be managed to prevent breeding of mosquitoes. More specifically:
  - a. All applied irrigation water must infiltrate completely within 24 hours.
  - b. Ditches not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation.
  - c. Low-pressure and un-pressurized pipelines and ditches, which are accessible to mosquitoes, shall not be used to store reclaimed water.
6. Discharges to the spray irrigation fields shall be managed to minimize erosion. Runoff from the disposal area must be captured and returned to the treatment facilities or spray fields.
7. The Discharger may not discharge effluent to the disposal fields 24 hours before precipitation, during periods of precipitation, and for at least 24 hours after cessation of precipitation, or when soils are saturated.
8. A 50-foot buffer zone shall be maintained between any watercourse and the wetted area produced during irrigation used for effluent disposal.
9. A 100-foot buffer zone shall be maintained between any spring, domestic well or irrigation well and the wetted area produced during irrigation used for effluent disposal.
10. A 50-foot buffer zone shall be maintained between effluent disposal areas and all property boundaries.
11. The resulting effect of the wastewater discharge on the soil pH shall not exceed the buffering capacity of the soil profile.

**H. 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. 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.
3. 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:

<u>Task</u>	<u>Compliance Date</u>
Submit Study Report	<b>1 November 2003</b>
Submit Study Report for dioxins	<b>1 November 2004</b>

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

On or before each compliance date, the Discharger shall submit to the Regional 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 Regional 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 may be reopened and effluent limitations added for the subject constituents.

4. 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 Regional Board evaluation, conduct

the TRE. This Order may 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.

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

<u>Task</u>	<u>Compliance Date</u>	<u>Report Due Date</u>
Submit Annual Status Report		<b>1 June, annually</b>
Submit Workplan/Time Schedule		<b>15 September 2002</b>
Full Compliance	<b>30 April 2007</b>	

The Discharger shall submit to the Regional 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 Regional Board by letter when it returns to compliance with the time schedule.

6. **Hydrogeologic Evaluation and Groundwater Monitoring Tasks. Within 18-months of the adoption of this Order**, the Discharger shall complete a hydrogeologic investigation within the area affected and potentially affected by the WWTF and its discharge(s) to land.

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 quarterly for a minimum of four quarters for nutrients, coliform organisms, pH, TDS and EC; and once for U.S. EPA priority pollutants initially and once for U.S. EPA priority pollutants during the life of the permit. 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 sufficient number of designated monitoring wells to evaluate performance of BPTC measures and determine if the discharge has degraded groundwater. 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 to which the Discharger applies effluent. The need for monitoring wells at reclamation areas will be determined on a case-by-case basis by Regional Board staff. 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, properly destroy ineffective 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. In no case shall the discharge be allowed to exceed a water quality objective. Where treatment system deficiencies are documented, the technical report shall provide recommendations for necessary modifications (e.g., new or revised salinity source control measures, WWTF 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.

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 Regional 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. R5-2002-0095, 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. Monitoring Reporting Program No. R5-2002-0095, which is part of this permit, requires that certain parameters be monitored on a continuous basis. The wastewater treatment plant is not staffed on a full time basis. Permit violations or system upsets can go undetected during periods when the plant is not staffed. The Discharger is required to establish an electronic system for operator notification for continuous recording device alarms. For existing continuous monitoring systems, the electronic notification system shall be installed within **six months** of

adoption of this permit. For systems installed following permit adoption, the notification system shall be installed simultaneously.

12. In the event the Discharger does not comply with an effluent limitation or receiving water limitation of this Order, the Discharger shall resample for the specific constituent for which the limitation was exceeded. The Discharger shall continue sampling at an increased frequency sufficient to determine the duration and severity of the violation. The frequency for constituents sampled using 24-hour composites on a 7-day a week schedule are exempted. This information shall be compiled in a written notification, which shall state nature, time, duration, and cause of noncompliance, and shall describe the measures being taken to remedy the noncompliance and, prevent recurrence. All permit violations must be reported to the Regional Board by telephone (916) 255-3000 within 24 hours of having knowledge of such noncompliance.
13. Minimum detection levels for monitoring required by this Order shall, unless impracticable, be adequate to demonstrate compliance with permit limitations.
14. This Order expires on **1 June 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.
15. 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 40°C (104°F), 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;



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I, THOMAS R. PINKOS, Acting 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 7 June 2002.

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THOMAS R. PINKOS, Acting Executive Officer



CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2002-0095

NPDES NO. CA0081612

FOR  
NEVADA COUNTY SANITATION DISTRICT NO. 1  
LAKE OF THE PINES WASTEWATER TREATMENT PLANT  
NEVADA COUNTY

This Monitoring and Reporting Program is issued pursuant to Water Code Section 13267. 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 Regional 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:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
20°C BOD <sub>5</sub>	mg/l, lbs/day	24-hr. Composite <sup>1</sup>	Twice Weekly
Total Suspended Solids	mg/l, lbs/day	24-hr. Composite <sup>1</sup>	Twice Weekly
Flow	mgd	Meter	Continuous

<sup>1</sup> The BOD and TSS samples shall be flow proportional composite samples with installation of sampler by 30 April 2007.

**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 dechlorination facilities will be considered adequately composited. Time of collection of samples shall be recorded. Effluent monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Flow	mgd	Meter	Continuous
Total Residual Chlorine	mg/l, lbs/day	Meter	Continuous

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<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Turbidity	NTU	Grab	Continuous <sup>1</sup>
pH	pH Units	Meter	Continuous <sup>1</sup>
Temperature	°F (°C)	Grab	Daily
Total Coliform Organisms <sup>2</sup>	MPN/100 ml	Grab	3 Times Weekly
Ammonia <sup>3, 4, 5, 6</sup>	mg/l, lbs/day (as N)	Grab	2 Times Weekly
20°C BOD <sub>5</sub>	mg/l, lbs/day	Grab	2 Times Weekly
Total Suspended Solids	mg/l, lbs/day	Grab	2 Times Weekly
Settleable Solids	ml/l	Grab	Daily
Electrical Conductivity @ 25°C	µhos/cm	Grab	Weekly
Nitrate + Nitrite	mg/l, lbs/day (as N)	Grab	Weekly
Nitrite	mg/l, lbs/day (as N)	Grab	Weekly
Aluminum	µg/l	Grab	Weekly
Hardness	mg/l (as CaCO <sub>3</sub> )	Grab	Monthly
Total Dissolved Solids	mg/l	Grab	Quarterly
Acute Toxicity <sup>7, 8</sup>	% Survival	Grab	Twice Annually
Priority Pollutants <sup>9, 10</sup>	mg/l	As Appropriate <sup>11</sup>	Annually <sup>12</sup>

<sup>1</sup> A continuous turbidity and pH monitoring system, or functional equivalent, shall be operational no later than 1 April 2007. Until that time, grab samples shall be collected and analyzed weekly.

<sup>2</sup> 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.

<sup>3</sup> Report as total ammonia.

<sup>4</sup> Concurrent with biotoxicity monitoring.

<sup>5</sup> In reporting lbs/day, the Discharger shall report both the lbs/day discharged and the calculated lbs/day limitation.

<sup>6</sup> Temperature and pH shall be recorded at the time of ammonia sample collection.

<sup>7</sup> The acute bioassay samples shall be analyzed using EPA/600/4-90/027F, Fourth Edition, or later amendment with Regional 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.

<sup>8</sup> Concurrent with ammonia monitoring.

<sup>9</sup> All peaks are to be reported, along with any explanation provided by the laboratory.

<sup>10</sup> Priority Pollutants is defined as U.S. EPA priority toxic pollutants and consists of the constituents listed in the most recent National Toxics Rule and California Toxics Rule.

<sup>11</sup> Volatile samples shall be grab samples; the remainder shall be flow proportional 24-hour composite samples.

<sup>12</sup> 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.

### LAND APPLICATION AREA MONITORING

Application of wastewater to the land application area shall be monitored to prevent overloading the area with wastewater constituents that can cause groundwater degradation. The following parameters shall be calculated and reported in the monthly monitoring reports.

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Frequency</u>
Flow	mgd	Meter	Daily
Application Area	acres	Measured	Daily
Hydraulic Loading Rate	inches/acre/month	Calculated	Monthly
20°C BOD	mg/l	Composite	Twice Weekly
Suspended Solids	mg/l	Composite	Twice Weekly
Settleable Solids	mg/l	Grab	Twice Weekly
Total Coliform Organisms	MPN/ 100 ml	Grab	Twice Weekly
pH	pH Units	Grab	Twice Weekly

In addition, the Discharger shall maintain a log of discharges to the land application area. Notations shall be made in a bound logbook record which checks the receiving wastewater, and observations of ponding water, soil clogging, odors, insects, or other potential nuisance conditions. The notations shall also document any corrective actions taken. A copy of the entries made in the log during each month shall be submitted along with monthly monitoring reports.

### POND MONITORING

The following shall constitute the wastewater monitoring program:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Frequency</u>
Freeboard	feet	---	Monthly
Electrical Conductivity @ 25°C	µmhos/cm	Grab	Monthly
Dissolved Oxygen	mg/l	Grab	Monthly
Odor			Monthly

### 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:

<u>Station</u>	<u>Description</u>
R-1	Magnolia Creek, 50 feet upstream from the point of discharge <sup>1</sup>
R-2	Magnolia Creek, 150 feet downstream from the point of discharge <sup>1</sup>

<sup>1</sup> Location may be changed upon Executive Officer's approval

<u>Constituents</u>	<u>Units</u>	<u>Station</u>	<u>Sampling Frequency</u>
Flow	cfs or mgd	R-1	Continuous
Dissolved Oxygen	mg/l <sup>13</sup> % saturation <sup>14</sup>	R-1, R-2	Weekly
pH	pH Units	R-1, R-2	Weekly
Turbidity	NTU	R-1, R-2	Weekly
Temperature	°F (°C)	R-1, R-2	Weekly
Electrical Conductivity @25°C	µmhos/cm	R-1, R-2	Weekly
Fecal Coliform Organisms	MPN/100 ml	R-1, R-2	Quarterly
Radionuclides	pCi/l <sup>15</sup>	R-1, R-2	Annually

<sup>13</sup> 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.

<sup>14</sup> Report both percent saturation and saturation concentration.

<sup>15</sup> 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-1 and R-2. Attention shall be given to the presence or absence of:

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

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. 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.

### GROUNDWATER MONITORING

Groundwater monitoring shall consist of at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
pH	Number	Meter	Quarterly
Temperature	°F	Grab	Quarterly
Total Coliform Organisms	MPN/100 ml	Grab	Quarterly
Electrical Conductivity @ 25°C	µmhos/cm	Grab	Quarterly
Nitrate	mg/l, lbs/day (as N)	Grab	Quarterly

### 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 (Antimony, Arsenic, Barium, Beryllium, Cadmium, Chromium VI and total, Cobalt, Copper, Fluoride, Lead, Mercury, Molybdenum, Nickel, Selenium, Silver, Thallium, Vanadium and Zinc).

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). 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:

<u>Constituents</u>	<u>Units</u>	<u>Sampling Frequency</u>
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.

### 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 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.

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0095  
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LAKE OF THE PINES WASTEWATER TREATMENT PLANT  
NEVADA COUNTY

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. The duration of excursions outside of limitations shall be reported.

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.

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).*
- 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 Regional 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.

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LAKE OF THE PINES WASTEWATER TREATMENT PLANT  
NEVADA COUNTY

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

Ordered by: \_\_\_\_\_  
THOMAS R. PINKOS, Acting Executive Officer

\_\_\_\_\_  
Date



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

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

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

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

**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

## **FACT SHEET**

ORDER NO. R5-2002-0095  
NEVADA COUNTY SANITATION DISTRICT NO. 1  
LAKE OF THE PINES WASTEWATER TREATMENT PLANT  
NEVADA COUNTY  
NPDES NO. CA0081612

### **SCOPE OF PERMIT**

This renewed Order regulates the discharge of up to 0.72 million gallons per day (mgd), design average dry weather flow (ADWF), of effluent from the Nevada County Sanitation District No. 1, Lake of the Pines Wastewater Treatment Plant (WWTP). This Order includes effluent, sludge, and surface water limitations, monitoring and reporting requirements, additional study requirements, and reopen provisions for effluent constituents.

### **BACKGROUND INFORMATION**

The Nevada County Sanitation District No. 1 owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to the community of Lake of the Pines with approximately 1,800 residences. The treatment plant is in Sections 27 and 28, T14N, R8E, MDB&M, as shown on Attachment A, a part of this Order. Treated municipal wastewater is discharged to Magnolia Creek, a water of the United States and tributary to the Bear River at the point, latitude 39° 02' 00" and longitude 121° 05' 01".

The treatment system consists of an unlined aeration pond, two unlined settling ponds, three unlined storage ponds, coagulation and flocculation, sand filtration, chlorination and dechlorination with a design capacity of 0.72 mgd. Chemical coagulation, flocculation, sand filtration and chlorination/dechlorination processes are for effluent disposal to Magnolia Creek during wet weather. Spray irrigation to 55 acres of hilly pasture of chlorinated effluent occurs from May through October and dry winter periods. The Discharger requested increasing the limit for pounds per day of BOD and TSS discharged to the creek during wet weather flows. The District would like to take advantage of the high creek flows to discharge the effluent. Although the discharge pumps have a capacity greater than 0.72 mgd, the chlorination system can only treat 0.72 mgd. Therefore, the discharge is limited to the capacity of the chlorination system and filtration system. However, the Discharger is not restricted to discharging only between November through April. As long as the Discharger continues to maximize spray irrigation disposal, the Discharger can discharge to Magnolia Creek as necessary.

### **RECEIVING WATER BENEFICIAL USES**

The receiving stream is Magnolia Creek, which is tributary to the Bear River. 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 Magnolia Creek 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 Magnolia Creek, the Regional Board finds that the beneficial uses identified in the Basin Plan for the Bear River are applicable to Magnolia Creek. The Basin Plan identifies the following beneficial uses for the Bear River: domestic and municipal use agricultural irrigation, agricultural stock watering, hydropower generation, body contact water recreation, canoeing and rafting, non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, potential warm fish migration habitat, potential cold fish migration habitat, potential warm spawning habitat, potential cold 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. . . .” Magnolia Creek does not meet the criteria for an exemption from the beneficial use of municipal and domestic supply.

#### *EFFLUENT LIMITATIONS FOR SURFACE WATER DISCHARGE*

All mass limitations in the permit were calculated by multiplying the concentration limitation by the design flow and the appropriate unit conversion factors.

**Flow**—The WWTP was designed to provide a tertiary level of treatment for up to its design flow of 0.72 mgd. The effluent flow limit is therefore set at 0.72 mgd.

**Total Coliform Organisms**—Tertiary treatment is required to protect the beneficial uses of contact recreation and agricultural irrigation downstream of the discharge into Magnolia Creek. 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. R5-2002-0095; 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, Magnolia Creek is a low-flow stream. At times, Magnolia Creek 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 Magnolia Creek, 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/ as a 7-day median, 23 MPN/100 m/ more than once in any 30 day period, and 240 MPN/100 m/ 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. Magnolia Creek, a low-flow 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 Regional 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, Order No. R5-2002-0095 includes tertiary effluent limitations based on protecting the beneficial uses of unrestricted contact recreation and irrigation in Magnolia Creek.

The Discharger currently maximizes the use of land disposal and discharges to Magnolia Creek during the winter flows. The existing permit limits the discharge to Magnolia Creek from November to April. This permit eliminates the seasonal limitations of the discharge. The seasonal discharge limitations are not necessary since the Discharger is required to treat the effluent to tertiary level treatment that protects all the beneficial uses of Magnolia Creek and the Bear River.

**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.

The WWTP is 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 15 mg/l, as a 30-day average, which is technically based on the capability of a 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.

**Total Residual Chlorine**—Chlorine is commonly used as a disinfection agent in the treatment of wastewater. The Nevada County Sanitation District No. 1 uses chlorine gas 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. R5-2002-0095.

***Ammonia, Nitrite, and Nitrate***— Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite 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 or denitrification may result in the discharge of ammonia, nitrite, or nitrate to the receiving stream in unacceptable concentrations.

In water, un-ionized ammonia ( $\text{NH}_3$ ) exists in equilibrium with the ammonium ion ( $\text{NH}_4^+$ ). 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.

The Basin Plan includes a water quality objective that “[a]ll water shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life”. 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 was 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 and because salmonids do inhabit Magnolia Creek, 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 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. R5-2002-0095.

For waters designated as having the beneficial use of municipal and domestic supply (MUN), the Basin Plan includes a water quality objective that water “shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs) specified in the following provisions of Title 22 of the California Code of Regulations...: Tables 64431-A (Inorganic Chemicals)...”. U.S. EPA has developed a primary MCL and an MCL goal of 1,000  $\mu\text{g/l}$  for nitrite (as nitrogen). The primary MCL listed in Title 22 of the California Code of Regulations (CCR), Table 64431-A, is also

1,000 µg/l for nitrite as nitrogen. For nitrate, U.S. EPA has developed Drinking Water Standards (10,000 µg/l as Primary Maximum Contaminant Level) and Ambient Water Quality Criteria for protection of human health (10,000 µg/l for non-cancer health effects). Title 22 CCR, Table 64431-A, also includes a primary MCL of 10,000 µg/l for the sum of nitrate and nitrite, measured as nitrogen. Recent toxicity studies have indicated a possibility that nitrate is toxic to aquatic organisms.

The conversion of ammonia to nitrites and the conversion of nitrites to nitrates present a reasonable potential for the discharge to exceed the primary maximum contaminant levels for nitrite and the sum of nitrite and nitrate. Therefore, Order No. R5-2002-0095 includes limitations for nitrite and the sum of nitrite and nitrate.

**Aluminum** -According to information submitted by the Discharger in the Self Monitoring Reports, 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 6 April 2001 at a concentration of 820 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. R5-2002-0095 includes maximum one-hour and four-day effluent limitations for aluminum.

**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. R5-2002-0095 requires both acute and chronic toxicity monitoring to evaluate compliance with this water quality objective.

The low-flow nature of Magnolia Creek means 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.

#### ***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. R5-2002-0095. 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
Monthly average	Average monthly discharge limitation. 30-day averages may have been converted to monthly averages to conform with 40 CFR §122.45 (see below)
1-Day average	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 ‘1-Day Average’ 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.”

U.S. EPA recommends a maximum daily limitation rather than an average weekly limitation for water quality based permitting.

#### RECEIVING WATER LIMITATIONS AND MONITORING

**Fecal coliform**—By the tributary rule, Magnolia Creek 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, Magnolia Creek has been designated as having the beneficial use of cold freshwater aquatic habitat (COLD). The California Department of Fish and Game has documented the presence of rainbow trout in Magnolia Creek near Bear River.

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 Magnolia Creek, 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, Magnolia Creek 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, Magnolia Creek 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 5°F 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 the permit 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 numbered 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.

*LAND DISCHARGE SPECIFICATIONS*

The Discharger utilizes ponds for the treatment and storage of wastewater. Land Discharge Specifications have been included in this permit to assure that the pond does not overflow or cause a nuisance. Nuisance conditions from ponds 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 pond.

The Discharger maximizes disposal of treated wastewater by spray irrigation. These requirements remove the seasonal limit of discharging tertiary treated effluent to Magnolia Creek only from November to April. Land Discharge Specifications have been included in this permit to assure that nuisance conditions are minimized. This permit requires a full tailwater return system. This permit requires a minimum pond freeboard be maintained to prevent overtopping.

kch 25 May 2004