

C. Water Reclamation Provisions

1. The Permittee shall manage recycled water, and shall develop, establish and enforce administrative procedures, engineering standards, rules, ordinances and/or regulations governing the design and construction of recycled water systems and use facilities and the use of recycled water in accordance with the criteria established in CCR title 22 and this Order. The Permittee shall develop user agreements requiring user compliance with CCR title 22 and this Order. Water reclamation engineering standards, rules, ordinances and/or regulations shall be approved by the Regional Water Board Executive Officer and CDPH.

Upon approval of the Permittee's procedures, engineering standards, rules, ordinances, and/or regulations, the Permittee may authorize specific additional water reclamation projects, on a case-by-case basis, in accordance with the approved program and agreements (Attachment G).

2. The Permittee shall submit revised and/or additional engineering report(s) to the Regional Water Board and CDPH, prior to initiating any recycled water use (e.g., new industrial use, recreational surface impoundments, water cooling, new dual-plumbed system, etc.) not addressed in any previously submitted CCR title 22 engineering report(s). Any revision(s) to a title 22 engineering report shall be prepared by a properly qualified engineer registered in California and experienced in the field of wastewater treatment.
3. The Permittee shall conduct periodic inspections of the recycled water use areas, facilities, and operations to monitor and assure compliance with the conditions of this Order. The Permittee shall take whatever actions are necessary, including termination of delivery of recycled water, to correct any user violations. Where dual-plumbed systems are utilized, the Permittee shall, upon prior notification to the user, conduct regular inspections to assure cross-connections are not made with potable water systems and CDPH approved backflow prevention devices are installed and operable.
4. The Permittee shall be responsible for ensuring that recycled water meets the quality standards of this Order and for the operation and maintenance of transport facilities and associated appurtenances. The Permittee shall hold the recycled water users responsible for the application and use of recycled water on their designated areas and associated operations and maintenance in accordance with all applicable CCR title 22 requirements and this Order. A designated site supervisor involved in the operation and/or maintenance of the recycled water system shall attend training regarding the safe and efficient operation of recycled water use facilities.

5. The Permittee shall notify the Regional Water Board Executive Officer in anticipation of reclaiming water at a new location, prior to commencement of reclamation activities at the new location. The notice shall include the following: site location; acreage involved; the specific use to be made of the recycled water; County Assessor Parcel number(s); a map of the use site showing the site boundaries in relation to the irrigation area and identifying the location of waterbodies, domestic wells, drinking fountains and other features that require protection; name of property owner; name of recycled water user; name and telephone number of recycled person or persons responsible for operation of the recycled water (water use site supervisor); and a User Reclamation Plan. The User Reclamation Plan shall estimate the anticipated volume of recycled water to be used and any special site conditions that require BMPs or other management practices beyond those identified in the Recycled Water Users' Guide.
6. If, in the opinion of the Regional Water Board Executive Officer, recycled water use at proposed new locations cannot be adequately regulated under the Master Reclamation Permit, a Report of Waste Discharge may be requested and individual Water Reclamation Requirements may be adopted.
7. Prior to the initial operation of any dual-plumbed recycled water system, and annually thereafter, the Permittee shall ensure that the dual-plumbed system within each facility and use area is inspected for possible cross connections with the potable water system. The recycled water system shall also be tested for possible cross connections at least once every four years. The testing shall be conducted in accordance with the method described in the Engineering Report. The inspections and the testing shall be performed by a cross connection control specialist certified by the California-Nevada section of the American Water Works Association or an organization with equivalent certification requirements. A written report documenting the result of the inspection or testing for the prior year shall be submitted to CDPH and the Regional Water Board by March 1 of each year. [CCR title 22, section 60316] [Urban]
8. If the Permittee delivers recycled water to any dual-plumbed recycled water system(s), the Permittee shall notify CDPH and the Regional Water Board of any incidents of backflow from the dual-plumbed recycled water system into the potable water system within 24 hours of the discovery of the incident. [Urban]
9. If the Permittee delivers recycled water to any dual-plumbed recycled water system(s), any backflow prevention device installed to protect the public water system serving the dual-plumbed recycled water system shall be inspected and maintained in accordance with section 7605 of title 17, CCR. [Urban]

ATTACHMENT G-1: APPROVED RECYCLED WATER USE SITES

The recycled water use sites identified in the table below and on the attached map are approved recycled water use sites. To maintain approval of these sites, the Permittee must submit technical reports for approval by the Regional Water Board Executive Officer to demonstrate that recycled water is applied in a manner that is protective of water quality, in compliance with Attachment G.

Table G-1. Approved Recycled Water Use Sites

Owner	APN	Type of Use/Irrigation Types	Total Irrigated Acreage	Volume of Recycled Water (Acre-feet/year)
Simonne LLC	010-320-032	Landscape Irrigation	0.53	4.6
Sonoma County Indian Health Project Inc.	010-320-022	Landscape Irrigation	0.72	2.7
City of Santa Rosa	010-320-019	Landscape Irrigation	1.0	2.0
City of Santa Rosa	010-680-014	Landscape Irrigation	0.46	1.1
Salvation Army	010-680-003	Landscape Irrigation	0.15	0.3
Madalyn LLC	010-680-015	Landscape Irrigation	0.9	1.1
Pacific Gas & Electric Co.	010-680-013	Landscape Irrigation	1.12	2.8
Marco Antonio LLC	010-680-016	Landscape Irrigation	0.57	1.4
1053 Bush LLC et al	146-040-002	Landscape Irrigation	0.58	3.0
Chang Income Property Partnership LP	010-381.067	Landscape Irrigation	0.71	2.3
Glenbrook Homeowners Association	146-130-041	Landscape Irrigation	1.58	6.0
City of Santa Rosa	010-361-055	Landscape Irrigation	2.31	2.6
Stony Point West LP	034-630-005 010-680-007	Landscape Irrigation	0.72	4.5
Westgate Homeowners Association	010-600-010	Landscape Irrigation	2.11	4.9
ABNK Properties LLC	146-040-025	Landscape Irrigation	2.03	2.8
Wyvern Restaurants	146-040-034	Landscape Irrigation	0.5	0.2
Presbytery of the Redwoods	010-311-017	Landscape Irrigation	2.46	0.7
Caltrans	N/A	Landscape Irrigation	2.2	0.3
Caltrans	N/A - Hwy Median at Hwy 12 & Stony Point	Landscape Irrigation	10.23	0.3
City of Santa Rosa	125-243-041	Landscape Irrigation	0.02	0.1
City of Santa Rosa	125-243-041	Landscape Irrigation	0.17	0.2
City of Santa Rosa	N/A - Street Median on W. Ninth Street	Landscape Irrigation	0.10	0.1
City of Santa Rosa	010-340-002	Landscape Irrigation	20.31	63
City of Santa Rosa	010-320-007	Landscape Irrigation	11.06	17.8

Table G-1. Approved Recycled Water Use Sites

Owner	APN	Type of Use/Irrigation Types	Total Irrigated Acreage	Volume of Recycled Water (Acre-feet/year)
City of Santa Rosa	010-320-030	Landscape Irrigation	0.4	1.7
Sonoma County Water Agency	152-133-007	Landscape Irrigation	0.51	0.2
City of Santa Rosa	010-320-030	Landscape Irrigation	1.43	4.2
Aggio, Val	130-200-063 130-200-064	Pasture or Fodder Crop	156	130
Codding Enterprises	046-051-045	Landscape Irrigation	26	23
Allen	130-231-020	Pasture or Fodder Crop	7	7.7
City of Santa Rosa - Alpha	060-060-051 060-060-052	Pasture or Fodder Crop	309	250
Applebees	143-391-084	Landscape Irrigation	1	.6
Ambrosini Home	035-011-009 130-020-034 130-020-035	Pasture or Fodder Crop	73	59.5
City of Santa Rosa - Walker Avenue Nursery	134-232-031	Turf, Vegetables/Specialty	10	2.8
Balletto	060-010-036 060-010-037 060-010-040	Vineyard	200	42
Beretta	134-051-012 134-051-013	Pasture or Fodder Crop	220	220
Bevill Family Trust	130-010-033	Vineyard	17	.2
City of Santa Rosa - Bottini	134-232-034	Pasture or Fodder Crop	2	0
Amato - Santa Rosa Horse Co	130-200-016 130-200-059	Pasture or Fodder Crop	40	25
City of Santa Rosa - Brown	060-060-059 060-060-060	Pasture or Fodder Crop	352	190
Browning	134-231-024	Pasture or Fodder Crop	10	0
Carinalli, D	060-060-036 060-060-041 060-060-042 060-060-057	Pasture or Fodder Crop Vineyard	80 85	120
Gonella	035-590-007	Landscape Irrigation	2	1.4
City of Rohnert Park	143-160-008 143-061-016 143-340-031 047-400-084 047-500-008 047-500-003 143-330-070 143-330-016	Landscape Irrigation. Toilet flushing	64	95

Table G-1. Approved Recycled Water Use Sites

Owner	APN	Type of Use/Irrigation Types	Total Irrigated Acreage	Volume of Recycled Water (Acre-feet/year)
	143-330-036 143-311-021 143-410-013 159-440-034 143-051-080 143-051-078 143-051-077 143-051-076 143-051-065 143-040-124			
Cotati / R.P. School	143-040-082 143-061-018 143-160-013 143-160-009 143-340-015 047-500-007 143-340-003 143-340-004 045-253-018 143-311-037 143-311-044	Landscape Irrigation	77	102
Countryside North	035-590-075	Landscape Irrigation	10	6.9
Dei / Nahmens	130-210-001	Pasture or Fodder Crop	90	145
Dei - Home	060-290-041	Pasture or Fodder Crop	160	195
Dei - LaFranconi / Lafayette	035-171-007 060-050-001 060-050-007	Pasture or Fodder Crop	210	290
Denner	057-070-015 057-080-026	Pasture or Fodder Crop Vineyard Turf, Vegetables/Specialty	165 60 100	440
Dotti	060-040-002 060-040-005 060-040-006	Pasture or Fodder Crop	150	200
City of Santa Rosa - Freitas	060-050-038	Turf, Vegetables/Specialty	10	0
Fresh Choice / Oil Stop	045-083-001 045-083-002	Landscape Irrigation	1	2.5
Gallo	024-050-012 046-181-023 046-181-024 046-181-025 046-182-001 046-182-003	Vineyard	250	155

Table G-1. Approved Recycled Water Use Sites

Owner	APN	Type of Use/Irrigation Types	Total Irrigated Acreage	Volume of Recycled Water (Acre-feet/year)
	046-216-004 113-210-056			
Gipson	035-590-016	Landscape Irrigation	2	.2
Fossell	063-150-024	Pasture or Fodder Crop	15	5
Guggiana	063-180-001	Vineyard	25	0
Mononi	130-030-036	Vineyard	22	2.1
Gradney	134-232-032 134-232-030	Pasture or Fodder Crop	10	5.1
Hansen	130-030-028 130-030-029 130-030-033 130-020-036 130-020-037	Pasture or Fodder Crop Vineyard	64 60	150
Hansel	130-210-022	Vineyard	65	7.5
Hendrix	035-590-009	Landscape Irrigation	2	.9
House	035-590-010	Landscape Irrigation	1	1.4
Bishop	063-120-020	Pasture or Fodder Crop	10	3.3
Hylbak	035-590-008	Landscape Irrigation	2	1.5
Ibleto	046-061-029 046-061-030	Vineyard	37	15
City of Santa Rosa - Devoto	134-232-035	Turf, Vegetables/Specialty	7	3.7
City of Santa Rosa - McEnnis / Lee	060-060-007	Turf, Vegetables/Specialty	7	2.5
Henry	130-491-015	Pasture or Fodder Crop	23	34
City of Santa Rosa - Keegan	060-060-044	Pasture or Fodder Crop	14	27.4
City of Santa Rosa - Kelly	060-020-001 060-020-081 060-020-084 060-020-082 060-020-085 060-010-005 060-010-028 060-010-032 060-010-030 060-010-027	Pasture or Fodder Crop	318	302
Korbel	130-010-073	Vineyard	29	5.5
Korbel / Rasmussen	034-110-029 034-110-054 034-110-055	Vineyard	90	14.2
Kunde	057-070-040	Vineyard	250	69

Table G-1. Approved Recycled Water Use Sites

Owner	APN	Type of Use/Irrigation Types	Total Irrigated Acreage	Volume of Recycled Water (Acre-feet/year)
	057-070-041 057-070-047 057-070-050	Landscape Irrigation	10	
Laguna Treatment Plant	062-240-025	Landscape Irrigation	3	1
Brady	134-141-007	Pasture or Fodder Crop	19	11
Mack	130-020-043	Pasture or Fodder Crop Vineyard	10 4	1.4
Martinelli	034-110-072	Vineyard	67	10
Matos	060-060-030 060-060-031	Pasture or Fodder Crop	51	91
Mello	060-040-034 060-050-002	Pasture or Fodder Crop	110	200
Riebli/Sunrise Farms	134-202-019	Pasture or Fodder Crop	45	16.5
Morrison	046-011-014 046-011-035 046-011-036	Pasture or Fodder Crop	100	115
City of Rohnert Park - Fox Tail Golf Course	143-360-046 143-360-047 143-360-048 143-280-021 143-280-061 143-280-078 143-280-075 143-280-045 160-010-003 160-010-021	Landscape Irrigation	250	400
Muelrath	134-202-010 134-202-018	Pasture or Fodder Crop Turf, Vegetables/Specialty	38 14	103
Noel	035-590-015	Landscape Irrigation	1	2.2
Nommsen	063-180-040 063-180-045	Pasture or Fodder Crop	95	4.5
Nonella	134-010-034 134-010-052	Pasture or Fodder Crop Vineyard	30 10	84
Vanazza Vineyard	130-230-071	Vineyard	60	11
Pacheco	060-040-017	Vineyard	50	4.9
Parker Compumotor	143-040-065 143-040-070	Landscape Irrigation	3	6.4
Peters	062-240-026 062-240-027 062-240-028 062-240-001	Pasture or Fodder Crop	130	180

Table G-1. Approved Recycled Water Use Sites

Owner	APN	Type of Use/Irrigation Types	Total Irrigated Acreage	Volume of Recycled Water (Acre-feet/year)
Carinelli, D - Home	062-220-002 062-220-003	Pasture or Fodder Crop	30	42
Poncia - Home	046-032-034 046-032-033 046-032-035 046-032-023	Pasture or Fodder Crop	100	60
Press Democrat	143-040-111 143-040-112	Landscape Irrigation	7	1.5
Rancho Laguna/LaFranchi	057-080-029	Pasture or Fodder Crop Vineyard	163 60	184
Robbins	130-020-018	Pasture or Fodder Crop	20	26.4
City of Rohnert Park - Roberts Lake	160-010-032	Landscape Irrigation	10	26
Rued	057-080-038	Pasture or Fodder Crop Vineyard	30 65	10
Underwood, Tracy	130-020-041	Pasture or Fodder Crop	40	28
Washoe Creek Golf Course	046-102-017 046-102-018	Landscape Irrigation	19	22
Sanchietti	060-030-012 060-030-029 060-030-034	Vineyard	60	23.8
Sonoma State University	047-131-011	Landscape Irrigation, toilet flushing, fire supression	90	160
State Farm	143-051-072	Landscape Irrigation	7	0
Mountain Shadows Apt	143-300-029	Landscape Irrigation	2	5.8
Rohnert Park Self Storage	143-391-081	Landscape Irrigation	1	1.8
Dei - Stone	060-330-011 130-250-014 130-250-049 130-250-050	Pasture or Fodder Crop	86	160
Moore	130-250-038	Vineyard	10	2.5
Strunk	063-120-009 063-120-012 063-120-018	Vineyard Turf, Vegetables/Specialty	10 29	58
Terri-Linda / Poncia	045-071-002 045-071-003 045-071-004 045-071-005 045-071-006 045-072-012 045-072-013 045-072-014	Pasture or Fodder Crop	130	115

Table G-1. Approved Recycled Water Use Sites

Owner	APN	Type of Use/Irrigation Types	Total Irrigated Acreage	Volume of Recycled Water (Acre-feet/year)
	045-072-015 046-021-031 046-021-032 046-021-033 046-021-034 046-021-035 046-021-036 046-021-037 046-021-038 046-021-028 046-021-029 046-021-025 046-021-026 046-021-024 134-261-003 134-264-005 134-264-006 134-264-007 134-264-008 134-264-003			
Tomrose	046-031-021	Pasture or Fodder Crop	30	36
Wells	063-170-015 063-170-017	Pasture or Fodder Crop	16	10.3
Collier	063-150-010	Pasture or Fodder Crop	14	3
Fomasi	063-170-001 063-170-002	Pasture or Fodder Crop	14	7
Grech	063-160-011	Pasture or Fodder Crop	16	0
Redwood Creek Apts	143-391-083	Landscape Irrigation	5	12.7
Errichetti	134-211-013	Landscape Irrigation	4.7	1
Ryan	063-120-001	pasture Irrigation	10	15
Rojas	130-250-057	Vineyard	10	2
Castaneda (Spider Web)	130-040-017	Vegetable Irrigation	40	45
<u>New Recycled Water Sites to be added as approved</u>				

ATTACHMENT H: SANTA ROSA NUTRIENT OFFSET PROGRAM

California Regional Water Quality Control Board
North Coast Region

RESOLUTION NO. R1-2008-0061
Approving
Santa Rosa Nutrient Offset Program
for the

City of Santa Rosa
Santa Rosa Subregional Water Reclamation Facility
Sonoma County

FINDINGS

The California Regional Water Quality Control Board, North Coast Region, (hereinafter Regional Water Board) finds that:

1. The City of Santa Rosa owns and operates the Santa Rosa Subregional Water Reclamation Facility (the "Facility"), a publicly owned treatment works. The Facility seasonally discharges into the Laguna de Santa Rosa and its tributaries. The Laguna de Santa Rosa is 303(d) listed for, among other constituents, low dissolved oxygen, nitrogen, and phosphorus.
2. The Regional Water Board adopted a renewed National Pollutant Discharge Elimination System ("NPDES") Permit for the City's Facility, Order No. R1-2006-0045, CA0022764, ("Permit") on September 20, 2006.
3. The Permit imposed the following final effluent limitations for nitrogen and phosphorous based on the Water Quality Control Plan's narrative water quality objective for biostimulatory substances:

"The Regional Board plans to develop and adopt total maximum daily loads (TMDLs) for nitrogen and phosphorus which will specify wasteload allocations (WLAs) for point sources and load allocations (LA) for non-point sources, as appropriate. Following the adoption of these TMDLs by the Regional Water Board, this Order will be issued with final WQBELs based on applicable WLAs. Alternatively, in the absence of a TMDL, at the end of the compliance schedule authorized by this Order, the final effluent limitation for nitrogen and phosphorus will be zero, or no net loading."

See Permit at Effluent Limitations section IV.A.1.g.

4. Footnote 5 to Effluent Limitations section IV.A.1.g. states:
"A 'no net loading' effluent limit may be met by: 1) reducing the effluent concentration below detectable levels through source control and/or treatment; 2) reducing loads through recycling/reclamation; and/or 3) reducing loads elsewhere in the watershed by an amount at least equal to the amount discharged (and of equivalent bioavailability) through an approved offset program."

5. Regional Water Board and City staff prepared the Santa Rosa Nutrient Offset Program ("Nutrient Offset Program"), attached hereto as Attachment 1, to qualify as the offset program referenced in footnote 5 to Effluent Limitations section IV.A.1.g. that the City can implement to comply with Effluent Limitations section IV.A.1.g. of the Permit.
6. The City of Santa Rosa has undertaken significant steps to reduce nitrogen concentrations in its effluent and to reduce nutrient loading to the Laguna de Santa Rosa. Activities currently underway or completed include improvements to its activated sludge treatment process to achieve partial denitrification, increased water recycling, increased diversion of effluent to the Geysers Steamfields, and development and implementation of programs involving source control, water conservation, biosolids application management and storm water control. The Nutrient Offset Program will provide a framework for achieving additional nutrient load reductions during the interim period before the nutrient TMDL for the Laguna de Santa Rosa is implemented.
7. The Nutrient Offset Program is designed to encourage the City to undertake nutrient reduction projects that improve habitat and ecosystem conditions, and to encourage the City to undertake nutrient reduction projects that reduce or eliminate non-point source or other discharges not currently subject to waste discharge requirements, waiver, or other permits. However, the Nutrient Offset Program prohibits the City from continuing to receive nutrient reduction credits for a project that later becomes subject to additional regulatory controls imposed by the Regional Water Board. The Offset Program shall in no way diminish the force and effect of any current or future controls on non-point source or other discharges imposed by the Regional Water Board. Non-point source or other discharges in violation of prohibitions or water quality standards remain subject to enforcement under the Water Code.
8. To ensure that no nutrient reduction project will overlap with best management practice activities required by the NPDES permit for the City's municipal separate storm water system ("MS4 Permit"), under the Nutrient Offset Program, the Executive Officer shall not approve project proposals for storm water best management practice activities that are required by the City's current MS4 Permit (Order No. R1-2003-0062, NPDES Permit CA0025054) or the renewed MS4 Permit (scheduled for adoption in late 2008).
9. The Nutrient Offset Program is consistent with the federal and state anti-degradation policies. The discharge to be offset is an existing point source, not a new discharge, and any source reduction efforts through the offset program most certainly will improve the receiving waters. To account for any uncertainties in granting reduction credits, all projects proposals must include an appropriate Margin of Safety (MOS), which can be described numerically, or by spatial and temporal aspects of a given proposal. The Executive Officer retains discretion to request reasonable modifications to the nutrient reduction credit ratio of a specific proposal or deny the proposal. In addition, the Executive Officer shall ensure

that any banked credits are distributed in a balanced manner to satisfy the no-net loading function, both spatially and temporally. In accepting credits proposed in the City's annual report, the first being submitted prior to the discharge season in 2011-2012, the Executive Officer shall ensure that the City's proposal distributes any banked credits in a manner that maximizes the benefit to water quality.

10. No CEQA documentation is required at this time. The program implements provisions of the NPDES permit, which are statutorily exempt from CEQA under Water Code section 13389. Individual proposals must comply with CEQA as explicitly provided for on page 3 of the Program. In the absence of specific proposals, any environmental analysis would be too remote and speculative to analyze. Moreover, because Regional Water Board staff maintains discretion to disapprove any proposal, the Program does not commit the Regional Water Board to any implementation. The Regional Water Board's approval of the Offset Program is a decision to establish procedural rules on how an individual proposal might be approved, and is independent of any proposal that might be approved and have an environmental effect. (See Cal. Code Regs., tit. 14, §15061(b)(3).)
11. Regional Water Board staff recommends Regional Water Board approval of the Santa Rosa Nutrient Offset Program.

RESOLUTION

THEREFORE, it is hereby resolved that:

The Regional Water Board approves the Santa Rosa Nutrient Offset Program, attached hereto as Attachment 1, as the approved offset program referenced in footnote 5 to Effluent Limitations section IV.A.1.g. of the Permit, that the City of Santa Rosa can implement to comply with Effluent Limitations section IV.A.1.g. of the Permit.

CERTIFICATION

I, Catherine E. Kuhlman, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, North Coast Region, on July 24, 2008.

Original signed by
Catherine E. Kuhlman
Executive Officer

ATTACHMENT 1

To

RESOLUTION NO. R1-2008-0061
Approving the Santa Rosa Nutrient Offset Program for the Santa Rosa Subregional
Water Reclamation System

SANTA ROSA NUTRIENT OFFSET PROGRAM

Program Framework

Key elements of the Santa Rosa Nutrient Offset Program include the following:

- **City's nutrient load to be offset.** The City would identify the anticipated total annual discharge and average total N and P concentrations to be offset when the load limit goes into effect (currently scheduled to take effect before the 2011-12 discharge season) as a basis for sizing initial nutrient control project(s). This would be calculated using the water balance model estimate of the average year recycled water discharge, which would be based on the most recent average dry weather flow estimate and average year reuse capacity at the time the estimate is complete. The actual load would be calculated using the actual discharge volume and the average nutrient concentration during discharge periods. The actual load would be used as described below to determine compliance with the no net loading provision.
- **Nutrient reduction credits to be gained by performance of selected removal/reduction actions.** The nutrient reduction quantity from removal/reduction actions implemented by the City to control source of nutrients to the Laguna other than its recycled water discharge shall be calculated using one of the two following approaches:
 - Direct measurement of nutrient reduction. The City shall receive 1 pound of nutrient reduction credit for each pound of nutrient reduced that would have been discharged to the Laguna de Santa Rosa resulting from nutrient removal/reduction actions amenable to direct measurement. A plan for measuring or estimating the nutrient quantity control would be proposed for each nutrient control project as described in the *Program Implementation* section below.
 - Estimated nutrient reduction. The effectiveness of some nutrient removal/reduction actions are not amenable to direct measurement. For nutrient removal/reduction actions not amenable to direct measurement, the City shall receive nutrient reduction credit calculated based on the median effectiveness estimate in literature or other lines of study or evidence for project most similar to the City's proposed actions. For example, if literature values from relevant studies indicate a particular pasture management method reduces nutrient loss

by 9, 10, 12, 20, and 25 percent respectively (as reported in five studies), the City would calculate and receive nutrient reduction credit using the 12 percent value.

- **Margin of Safety.** All project proposals shall include a technically supportable Margin of Safety (MOS) to address uncertainties associated with nutrient reduction ratios and to ensure that the project will result in demonstrable water quality benefits. In reviewing direct and estimated nutrient reduction ratios for each proposal, the Executive Officer shall have discretion to request modification of the ratio based on the characteristics of a given proposal.
- **Storm water management projects.** No nutrient reduction project will overlap with best management practice activities required by the NPDES permit for the City's municipal separate storm water system ("MS4 Permit"). Under the Nutrient Offset Program, the Executive Officer shall not approve project proposals for storm water best management practice activities that are required by the City's current MS4 Permit (Order No. R1-2003-0062, NPDES Permit CA0025054) or the renewed MS4 Permit (scheduled for adoption in late 2008).
- **Nutrient reduction credit accounting.** Compliance with the no net loading requirement shall be calculated using a three-year averaging period. Each year the City will strive to offset the full amount of each year's anticipated discharge and will implement the approved projects as described in the annual report. At the end of each year, the City shall subtract the nutrient load reduction (pounds) from the City's actual nutrient discharge load, and may average the difference in the past three years. The City shall be deemed in compliance if the City has offset the full amount of actual discharge for the three year period if the three-year average difference is less than or equal to zero mass units.
- The no net nutrient loading requirement is scheduled to take effect at the beginning of the 2011-2012 discharge seasons. The City may choose to implement nutrient removal/reduction actions prior to the 2011-2012 discharge season. Credit (in pounds) for any nutrient removal/reduction actions implemented after 2007 and prior to the 2011-2012 discharge season shall be available to apply to the City's first three years of nutrient reduction. Any "banked" credits shall be distributed in a balanced manner so that water quality benefits from the Program are maximized. Factors to consider in this regard include the proportion of credits to new or ongoing projects in any given year, and the spatial temporal qualities of each credit. This issue will be considered when reviewing the nutrient reduction ratio of a given project and/or the City's annual report describing how the City plans to offset its anticipated discharge.
- The City may need to invest in capital facilities to comply with the no net nutrient loading requirement. Load reduction benefits from any such long-term capital facilities will continue to accrue to the City for the full life of such capital facilities until or unless additional regulatory controls are imposed by the RWQCB (for example, waste discharge requirements, waiver of waste discharge requirements, NPDES permit requirements, or 401 certifications) to control the same nutrient discharges the capital facilities are designed to control.

Program Implementation

Program implementation would occur according to the following steps:

1. City identifies nutrient reduction project(s)
2. City submits description of nutrient reduction project(s) to RWQCB documenting consistency with adopted Santa Rosa Nutrient Offset Program
3. RWQCB accepts proposed nutrient reduction project(s)
4. City implements project(s)
5. City submits annual report documenting nutrient discharged and controlled

Each step is described below.

1. *City identifies nutrient reduction project(s)*

The City shall preliminarily estimate the mass of N and P that could be removed or prevented from discharging to the Laguna and its tributaries as needed to achieve no net loading (*i.e.* an amount equal to the annual N and P mass emission from the Laguna Plant).

After assessing the options, the City shall identify one or more preferred nutrient reduction projects for implementation. The City would contact other parties (*e.g.* land owners, RCD, etc.) with which the City would need to partner to implement the project(s) to determine interest, cost and feasibility.

2. *City submits description of nutrient reduction project(s) to RWQCB*

The City shall prepare a description of the project(s) identified in step 1 above that includes the following:

- Project location
- Description of N and P control facilities or practices
- Quantity of N and P removed or controlled to be calculated as described in the *Program Framework* section above.
- Expected life of facility or duration of practice. This description shall include a description of the facility and/or practice, plus any written agreements related to construction and maintenance of the facility or implementation of the practice.
- Monitoring and reporting plan to document continued N and P removal. N and P removal shall be measured or estimated according to the type of removal/reduction actions identified in the *Nutrient reduction credits to be gained by performance of selected removal/reduction actions* section above.
- Description of anticipated or actual CEQA documentation.

3. *RWQCB accepts proposed nutrient reduction project(s)*

The Executive Officer of the RWQCB shall accept or reject the nutrient reduction project(s) submitted by the City in writing within 60 days of submittal or the project(s) are deemed accepted. The actual load reduction shall be determined according to the monitoring and reporting plan. The Executive Officer shall provide notice and the opportunity for the public to comment on the project(s). After consideration of any public comments and all available information, the Executive Officer may suggest modifications to the project(s) as necessary for acceptance. The Executive Officer of the RWQCB shall maintain discretion over accepted projects to request reasonable modifications based upon significant new information.

4. *City implements load reduction project(s) as proposed and accepted*

The City, with any partners, shall implement the nutrient reduction project(s) as proposed and accepted.

5. *City submits annual report documenting nutrient discharged and controlled*

Beginning in 2011, by July 1st each year, the City shall provide a report to RWQCB documenting the following:

- Mass of N and P anticipated to be discharged to the Laguna de Santa Rosa (and tributaries) for the upcoming discharge season and a description of how the City plans to offset the anticipated discharge.
- Mass of N and P actually discharged to the Laguna de Santa Rosa (and tributaries) during the previous discharge season, and the two prior discharge seasons if applicable.
- Mass of N and P controlled during the previous twelve months (i.e., July 1st through June 30th, of the previous twelve months), and the two (2) prior twelve month periods years if applicable.
- Calculation of the two and three year averaging, if applicable.
- Detailed report for each of the accepted nutrient reduction projects according to projects' respective monitoring and reporting plan.
- The report shall be signed and certified in accordance with 40 CFR 122.22(d).

The annual report will be posted on the RWQCB website. A RWQCB staff contact will be listed for any questions or comments regarding the report.

Exhibit 1 below is an example where the City would be in compliance in all years (i.e., the Three-Year Average" value is less than 0 kg). The example in Exhibit 1 demonstrates that compliance with the requirement of the 0 kg three-year average requirement is achieved in 2013-14 by using some of the pre-2011 credit.

EXHIBIT 1

To

SANTA ROSA NUTRIENT OFFSET PROGRAM

	Kg Phosphorus					
	Pre-2011	2011-12	2012-13	2013-14	2014-15	2015-16
Anticipated City Discharge		4824	5400	5977	6554	7131
Actual City Discharge		4968	5238	7113	6030	8129
Control Project 1		3900	3950	3610	3290	4580
Control Project 2		900	1200	1200	1200	1200
Control Project 3			100	2000	2000	2200
Control Project 4						
Total Control		4800	5250	6810	6490	7980
Net Load		168	-12	303	-460	149
Pre-2011 credit available	500	500	332	332	0	0
Pre-2011 credit used		168	0	303		
Annual Load For Compliance		0	-12	0	-460	149
Three-Year Average				-4	-157	-104

California Regional Water Quality Control Board
North Coast Region

RESOLUTION NO. R1-2008-0061
Approving
Santa Rosa Nutrient Offset Program
for the

City of Santa Rosa
Santa Rosa Subregional Water Reclamation Facility
Sonoma County

FINDINGS

The California Regional Water Quality Control Board, North Coast Region, (hereinafter Regional Water Board) finds that:

1. The City of Santa Rosa owns and operates the Santa Rosa Subregional Water Reclamation Facility (the "Facility"), a publicly owned treatment works. The Facility seasonally discharges into the Laguna de Santa Rosa and its tributaries. The Laguna de Santa Rosa is 303(d) listed for, among other constituents, low dissolved oxygen, nitrogen, and phosphorus.
2. The Regional Water Board adopted a renewed National Pollutant Discharge Elimination System ("NPDES") Permit for the City's Facility, Order No. R1-2006-0045, CA0022764, ("Permit") on September 20, 2006.
3. The Permit imposed the following final effluent limitations for nitrogen and phosphorous based on the Water Quality Control Plan's narrative water quality objective for biostimulatory substances:

"The Regional Board plans to develop and adopt total maximum daily loads (TMDLs) for nitrogen and phosphorus which will specify wasteload allocations (WLAs) for point sources and load allocations (LA) for non-point sources, as appropriate. Following the adoption of these TMDLs by the Regional Water Board, this Order will be issued with final WQBELs based on applicable WLAs. Alternatively, in the absence of a TMDL, at the end of the compliance schedule authorized by this Order, the final effluent limitation for nitrogen and phosphorus will be zero, or no net loading."

See Permit at Effluent Limitations section IV.A.1.g.

4. Footnote 5 to Effluent Limitations section IV.A.1.g.states:
"A 'no net loading' effluent limit may be met by: 1) reducing the effluent concentration below detectable levels through source control and/or treatment; 2) reducing loads through recycling/reclamation; and/or 3) reducing loads elsewhere in the watershed by an amount at least equal to the amount discharged (and of equivalent bioavailability) through an approved offset program."

5. Regional Water Board and City staff prepared the Santa Rosa Nutrient Offset Program ("Nutrient Offset Program"), attached hereto as Attachment 1, to qualify as the offset program referenced in footnote 5 to Effluent Limitations section IV.A.1.g. that the City can implement to comply with Effluent Limitations section IV.A.1.g. of the Permit.
6. The City of Santa Rosa has undertaken significant steps to reduce nitrogen concentrations in its effluent and to reduce nutrient loading to the Laguna de Santa Rosa. Activities currently underway or completed include improvements to its activated sludge treatment process to achieve partial denitrification, increased water recycling, increased diversion of effluent to the Geysers Steamfields, and development and implementation of programs involving source control, water conservation, biosolids application management and storm water control. The Nutrient Offset Program will provide a framework for achieving additional nutrient load reductions during the interim period before the nutrient TMDL for the Laguna de Santa Rosa is implemented.
7. The Nutrient Offset Program is designed to encourage the City to undertake nutrient reduction projects that improve habitat and ecosystem conditions, and to encourage the City to undertake nutrient reduction projects that reduce or eliminate non-point source or other discharges not currently subject to waste discharge requirements, waiver, or other permits. However, the Nutrient Offset Program prohibits the City from continuing to receive nutrient reduction credits for a project that later becomes subject to additional regulatory controls imposed by the Regional Water Board. The Offset Program shall in no way diminish the force and effect of any current or future controls on non-point source or other discharges imposed by the Regional Water Board. Non-point source or other discharges in violation of prohibitions or water quality standards remain subject to enforcement under the Water Code.
8. To ensure that no nutrient reduction project will overlap with best management practice activities required by the NPDES permit for the City's municipal separate storm water system ("MS4 Permit"), under the Nutrient Offset Program, the Executive Officer shall not approve project proposals for storm water best management practice activities that are required by the City's current MS4 Permit (Order No. R1-2003-0062, NPDES Permit CA0025054) or the renewed MS4 Permit (scheduled for adoption in late 2008).
9. The Nutrient Offset Program is consistent with the federal and state anti-degradation policies. The discharge to be offset is an existing point source, not a new discharge, and any source reduction efforts through the offset program most certainly will improve the receiving waters. To account for any uncertainties in granting reduction credits, all projects proposals must include an appropriate Margin of Safety (MOS), which can be described numerically, or by spatial and temporal aspects of a given proposal. The Executive Officer retains discretion to request reasonable modifications to the nutrient reduction credit ratio of a specific proposal or deny the proposal. In addition, the Executive Officer shall ensure

that any banked credits are distributed in a balanced manner to satisfy the no-net loading function, both spatially and temporally. In accepting credits proposed in the City's annual report, the first being submitted prior to the discharge season in 2011-2012, the Executive Officer shall ensure that the City's proposal distributes any banked credits in a manner that maximizes the benefit to water quality.

10. No CEQA documentation is required at this time. The program implements provisions of the NPDES permit, which are statutorily exempt from CEQA under Water Code section 13389. Individual proposals must comply with CEQA as explicitly provided for on page 3 of the Program. In the absence of specific proposals, any environmental analysis would be too remote and speculative to analyze. Moreover, because Regional Water Board staff maintains discretion to disapprove any proposal, the Program does not commit the Regional Water Board to any implementation. The Regional Water Board's approval of the Offset Program is a decision to establish procedural rules on how an individual proposal might be approved, and is independent of any proposal that might be approved and have an environmental effect. (See Cal. Code Regs., tit. 14, §15061(b)(3).)
11. Regional Water Board staff recommends Regional Water Board approval of the Santa Rosa Nutrient Offset Program.

RESOLUTION

THEREFORE, it is hereby resolved that:

The Regional Water Board approves the Santa Rosa Nutrient Offset Program, attached hereto as Attachment 1, as the approved offset program referenced in footnote 5 to Effluent Limitations section IV.A.1.g. of the Permit, that the City of Santa Rosa can implement to comply with Effluent Limitations section IV.A.1.g. of the Permit.

CERTIFICATION

I, Catherine E. Kuhlman, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, North Coast Region, on July 24, 2008.

Catherine E. Kuhlman
Executive Officer

ATTACHMENT 1

To

RESOLUTION NO. R1-2008-0061

Approving the Santa Rosa Nutrient Offset Program for the Santa Rosa Subregional
Water Reclamation System

SANTA ROSA NUTRIENT OFFSET PROGRAM

Program Framework

Key elements of the Santa Rosa Nutrient Offset Program include the following:

- **City's nutrient load to be offset.** The City would identify the anticipated total annual discharge and average total N and P concentrations to be offset when the load limit goes into effect (currently scheduled to take effect before the 2011-12 discharge season) as a basis for sizing initial nutrient control project(s). This would be calculated using the water balance model estimate of the average year recycled water discharge, which would be based on the most recent average dry weather flow estimate and average year reuse capacity at the time the estimate is complete. The actual load would be calculated using the actual discharge volume and the average nutrient concentration during discharge periods. The actual load would be used as described below to determine compliance with the no net loading provision.
- **Nutrient reduction credits to be gained by performance of selected removal/reduction actions.** The nutrient reduction quantity from removal/reduction actions implemented by the City to control source of nutrients to the Laguna other than its recycled water discharge shall be calculated using one of the two following approaches:
 - Direct measurement of nutrient reduction. The City shall receive 1 pound of nutrient reduction credit for each pound of nutrient reduced that would have been discharged to the Laguna de Santa Rosa resulting from nutrient removal/reduction actions amenable to direct measurement. A plan for measuring or estimating the nutrient quantity control would be proposed for each nutrient control project as described in the *Program Implementation* section below.
 - Estimated nutrient reduction. The effectiveness of some nutrient removal/reduction actions are not amenable to direct measurement. For nutrient removal/reduction actions not amenable to direct measurement, the City shall receive nutrient reduction credit calculated based on the median effectiveness estimate in literature or other lines of study or evidence for project most similar to the City's proposed actions. For example, if literature values from relevant studies indicate a particular pasture management method reduces nutrient loss

by 9, 10, 12, 20, and 25 percent respectively (as reported in five studies), the City would calculate and receive nutrient reduction credit using the 12 percent value.

- o Margin of Safety. All project proposals shall include a technically supportable Margin of Safety (MOS) to address uncertainties associated with nutrient reduction ratios and to ensure that the project will result in demonstrable water quality benefits. In reviewing direct and estimated nutrient reduction ratios for each proposal, the Executive Officer shall have discretion to request modification of the ratio based on the characteristics of a given proposal.
- o Storm water management projects. No nutrient reduction project will overlap with best management practice activities required by the NPDES permit for the City's municipal separate storm water system ("MS4 Permit"). Under the Nutrient Offset Program, the Executive Officer shall not approve project proposals for storm water best management practice activities that are required by the City's current MS4 Permit (Order No. R1-2003-0062, NPDES Permit CA0025054) or the renewed MS4 Permit (scheduled for adoption in late 2008).
- **Nutrient reduction credit accounting.** Compliance with the no net loading requirement shall be calculated using a three-year averaging period. Each year the City will strive to offset the full amount of each year's anticipated discharge and will implement the approved projects as described in the annual report. At the end of each year, the City shall subtract the nutrient load reduction (pounds) from the City's actual nutrient discharge load, and may average the difference in the past three years. The City shall be deemed in compliance if the City has offset the full amount of actual discharge for the three year period if the three-year average difference is less than or equal to zero mass units.
- The no net nutrient loading requirement is scheduled to take effect at the beginning of the 2011-2012 discharge seasons. The City may choose to implement nutrient removal/reduction actions prior to the 2011-2012 discharge season. Credit (in pounds) for any nutrient removal/reduction actions implemented after 2007 and prior to the 2011-2012 discharge season shall be available to apply to the City's first three years of nutrient reduction. Any "banked" credits shall be distributed in a balanced manner so that water quality benefits from the Program are maximized. Factors to consider in this regard include the proportion of credits to new or ongoing projects in any given year, and the spatial temporal qualities of each credit. This issue will be considered when reviewing the nutrient reduction ratio of a given project and/or the City's annual report describing how the City plans to offset its anticipated discharge.
- The City may need to invest in capital facilities to comply with the no net nutrient loading requirement. Load reduction benefits from any such long-term capital facilities will continue to accrue to the City for the full life of such capital facilities until or unless additional regulatory controls are imposed by the RWQCB (for example, waste discharge requirements, waiver of waste discharge requirements, NPDES permit requirements, or 401 certifications) to control the same nutrient discharges the capital facilities are designed to control.

Program Implementation

Program implementation would occur according to the following steps:

1. City identifies nutrient reduction project(s)
2. City submits description of nutrient reduction project(s) to RWQCB documenting consistency with adopted Santa Rosa Nutrient Offset Program
3. RWQCB accepts proposed nutrient reduction project(s)
4. City implements project(s)
5. City submits annual report documenting nutrient discharged and controlled

Each step is described below.

1. City identifies nutrient reduction project(s)

The City shall preliminarily estimate the mass of N and P that could be removed or prevented from discharging to the Laguna and its tributaries as needed to achieve no net loading (*i.e.* an amount equal to the annual N and P mass emission from the Laguna Plant).

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EXHIBIT 1

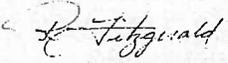
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SANTA ROSA NUTRIENT OFFSET PROGRAM

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North Coast Regional Water Quality Control Board

TO: Charles Reed, Core Regulatory Unit
Cathleen Goodwin, Core Regulatory Unit
Mona Dougherty, Core Regulatory Unit Supervisor
David Leland, Watershed Protection Division Chief
David Rice, Office of Chief Counsel

FROM: 
Rebecca Fitzgerald, TMDL Unit Supervisor

DATE: October 22, 2013

SUBJECT: SUMMARY OF TMDL DEVELOPMENT DATA PERTAINING TO NUTRIENT
IMPAIRMENTS IN THE LAGUNA DE SANTA ROSA WATERSHED [REVISED]

INTRODUCTION

The purpose of this memorandum is to summarize information and data analyzed by Regional Water Board staff to date for the development of the Laguna de Santa Rosa Total Maximum Daily Loads (TMDLs) for nitrogen, phosphorus, dissolved oxygen, temperature and sediment - as such are relevant to the development of National Pollutant Discharge Elimination System (NPDES) permits for the City of Santa Rosa Subregional Water Reclamation System and for the Town of Windsor Wastewater Treatment, Reclamation, and Disposal System. In response to public comments received on the aforementioned permits, portions of this memorandum have been revised and clarified since it was originally issued on June 14, 2013. This memorandum supersedes the original version.

The greater Laguna de Santa Rosa watershed consists of the Laguna de Santa Rosa, Santa Rosa Creek, and Mark West Creek hydrologic subareas (HSAs), as mapped in the Water Quality Control Plan for the North Coast Region (NCRWQCB 2011), also known as the Basin Plan.

The information and data summarized herein primarily pertain to the nutrient impairments and the nutrient assimilative capacity of the mainstem of the Laguna de Santa Rosa (hereinafter mainstem Laguna, which approximately begins in the City of Cotati and flows north to its confluence with Mark West Creek) and the lower portion of the mainstem

of Mark West Creek (hereinafter, lower Mark West Creek, from its confluence with the mainstem Laguna to its confluence with the Russian River). These water bodies (and the wetland and riparian areas that surround them) provide habitat for hundreds of species of birds, mammals, reptiles, amphibians, some endangered plants, and several species of fish, including threatened steelhead trout and endangered coho salmon.

STATUS OF 303(d) LISTINGS AND TMDL DEVELOPMENT

On October 11, 2011, the United States Environmental Protection Agency (USEPA) provided final approval of the most current Clean Water Act (CWA) Section 303(d) list of impaired water bodies prepared by the State of California. The list identifies the entire Russian River watershed, including the Laguna de Santa Rosa, Santa Rosa Creek, and Mark West Creek HSAs, as impaired by excess sediment and elevated water temperatures. In addition, Santa Rosa Creek HSA, the Laguna de Santa Rosa HSA, and portions of the Lower and Middle Russian River hydrologic areas are identified as impaired by pathogenic indicator bacteria. The Laguna de Santa Rosa HSA is also identified as impaired by low dissolved oxygen, nitrogen, phosphorus, and mercury.

TMDLs for nitrogen, ammonia, and dissolved oxygen were approved by the USEPA in 1995 in the form of the Waste Reduction Strategy for the Laguna de Santa Rosa (Morris 1995). The Waste Reduction Strategy (Strategy) called for the reduction of nitrogen loads to address ammonia toxicity concerns along the mainstem Laguna and lower Mark West Creek. The Strategy was implemented via improvements to municipal wastewater treatment facilities and dairy management practices in the greater Laguna de Santa Rosa watershed. These improvements are the likely cause of observed reductions in nutrient concentrations in the mainstem Laguna between the late 1990s and early 2000s (Sloop et al. 2007).

Regional Water Board staff are currently developing new TMDLs for nitrogen, phosphorus, dissolved oxygen, temperature, and sediment in the greater Laguna de Santa Rosa watershed to address continuing water quality impairments. These TMDLs will apply to all water bodies in the Laguna de Santa Rosa, Santa Rosa Creek, and Mark West Creek HSAs. These TMDLs are estimated to be completed in a few years.

Regional Water Board staff are also currently developing a pathogen TMDL to address indicator bacteria impairments in the Russian River, the Laguna de Santa Rosa, and the Santa Rosa Creek watersheds. The pathogen TMDL is estimated to be completed in 2016. Development of a mercury TMDL for the Laguna de Santa Rosa is not yet scheduled.

SUMMARY OF WATER QUALITY IMPAIRMENTS CAUSED BY NUTRIENTS

Nitrogen compounds (ammonia, nitrate, nitrite, and forms of organic nitrogen) and phosphorus compounds (particulate and dissolved forms of phosphorus) in surface waters can stimulate the growth rates of photosynthetic bacteria, algae, and other aquatic plants. The overabundance of nitrogen and phosphorus compounds in surface water bodies can result in the excessive growth and decay of these organisms, thus accelerating the process of eutrophication, especially in lake-like waters. These phenomena cause dissolved oxygen

levels to drop below concentrations needed for the survival and health of fish and aquatic life, negatively affects the aesthetic quality of water bodies, and impairs beneficial uses.

While nutrient inputs to an aquatic system can significantly contribute to biostimulatory conditions, there are other contributing factors. These include physical factors that influence how nutrients are processed within a particular water body, including: wind, water temperatures, riparian cover, channel geometry, and stream flows.

In addition to being a causative agent of an aquatic system's biostimulatory response, excessive amounts of nitrogen can also contribute to instream ammonia toxicity, as described by Butkus (2013). Ammonification is the process by which nitrogen compounds are converted to ammonia, which is toxic to fish and aquatic life in its unionized form. High concentrations of total nitrogen can lead to high levels of ammonia toxicity, especially where instream temperatures and pH levels are high.

SUMMARY OF APPLICABLE WATER QUALITY STANDARDS RELATED TO NUTRIENT IMPAIRED CONDITIONS

Biostimulatory Substances

The Basin Plan contains a narrative water quality objective for biostimulatory substances that states: "Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses."

To interpret this narrative objective, Regional Water Board staff evaluate available data and information under three distinct categories: biostimulatory stressors, indicators of a biostimulatory response, and stressor-response relationships.

Biostimulatory stressors (or causal factors) include, but are not limited to: concentrations of total nitrogen and total phosphorus, water temperatures, riparian cover, channel geometry, and stream flows. Recommended numeric criteria for concentrations of total nitrogen and total phosphorus are summarized in the section below.

Response indicators include, but are not limited to: concentrations of dissolved oxygen and chlorophyll *a* (a measure of algal biomass), pH levels, and other observable phenomena such as macrophyte and algae blooms, and changes in the species composition of plant and animal communities that occupy the water body. Recommended numeric criteria for concentrations of chlorophyll *a* are summarized in the section below. Numeric Basin Plan objectives for dissolved oxygen are presented in the subsequent section.

Where sufficient site-specific data are available, staff use a combination of research, analysis, and/or modeling to characterize relationships between biostimulatory stressors and observed responses, and if possible, to determine which stressors cause (or control) those responses in a particular water body.

Nitrogen, Phosphorus, and Chlorophyll *a*

In the early 2000s, the USEPA proposed new total nitrogen, total phosphorus, and chlorophyll *a* criteria for rivers and streams (USEPA 2000) and for lakes and reservoirs (USEPA 2001) based on aggregate ecoregions. Table 1 shows the recommended criteria proposed for Aggregate Nutrient Ecoregion III, which includes the greater Laguna de Santa Rosa watershed. The criteria were empirically derived to represent reference conditions for surface waters, and are based on 25th percentiles of all nutrient data in Aggregate Nutrient Ecoregion III.

Table 1. USEPA Recommended Nitrogen, Phosphorus, and Chlorophyll *a* Criteria for Surface Water Bodies

Constituent	(Lentic) Criteria for Lakes & Reservoirs	(Lotic) Criteria for Rivers & Streams
Total Nitrogen	0.40 mg/L	0.38 mg/L
Total Phosphorus	0.017mg/L	0.02188 mg/L
Chlorophyll <i>a</i>	0.0034 mg/L	0.00178 mg/L

In addition, the State Water Resources Control Board (State Water Board) developed evaluation guidelines for assessing biostimulatory conditions to identify impaired waters for the CWA Section 303(d) list (SWRCB 2007). For rivers and streams, State Water Board staff reviewed the California Nutrient Numeric Endpoint (California NNE) technical approach (Tetra Tech 2006) and four subsequent California case studies. For lakes and reservoirs, State Water Board staff reviewed relevant work pertaining to pollutant effects in freshwater lakes and reservoirs (Welch & Jacoby 2004, as cited in SWRCB 2007). These efforts resulted in the development of nutrient numeric screening tools for total nitrogen, total phosphorous, and chlorophyll *a* concentrations in California surface waters to interpret narrative Basin Plan water quality objectives, as shown in Table 2.

Table 2. California Recommended Nitrogen, Phosphorus, and Chlorophyll *a* Criteria for Surface Water Bodies

Constituent	(Lentic) Criteria for Lakes & Reservoirs	(Lotic) Criteria for Rivers & Streams with COLD, REC, MUN, & SPWN Beneficial Uses	(Lotic) Criteria for Rivers & Streams with WARM Beneficial Uses
Total Nitrogen	1.200 mg/L	0.23 mg/L	0.52 mg/L
Total Phosphorus	0.100 mg/L	0.02 mg/L	0.08 mg/L
Chlorophyll <i>a</i>	0.010 mg/L	150 mg/m ²	200 mg/m ²

Dissolved Oxygen

The Basin Plan contains numeric water quality objectives for dissolved oxygen, which vary by water body. For the Laguna de Santa Rosa, the Basin Plan states that dissolved oxygen concentrations shall not fall below 7.0 mg/L at any time, that 90% or more of all dissolved oxygen values in a calendar year must be equal to or greater than 7.5 mg/L, and that 50% or more of all monthly mean dissolved oxygen values in a calendar year must be equal to or greater than 10.0 mg/L.

Ammonia Toxicity

The Basin Plan contains a narrative water quality objective for toxicity that states: "All waters shall be maintained free of toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in human, plant, animal, or aquatic life."

Water quality criteria for toxicity due to ammonia concentrations in fresh water systems have changed over the last several decades (Butkus 2013). Regional Water Board staff currently rely on USEPA's recommended criteria from the 1999 Update of Ambient Water Quality Criteria for Ammonia (USEPA 1999) to interpret the Basin Plan's narrative objective for toxicity from ammonia.¹ The USEPA recommends acute and chronic water quality criteria for the protection of aquatic life, which are expressed as mathematical formulas. The acute criterion varies depending on pH and on the presence or absence of salmonids. This criterion is expressed as the one-hour concentration of total ammonia nitrogen that shall not be exceeded more than once every three years. The chronic criterion varies depending on pH, water temperature, and the presence or absence of early life stages of fish. This criterion is expressed as the thirty-day average concentration of total ammonia nitrogen that shall not be exceeded more than once every three years. Examples of the acute criteria are presented in Table 3.

Table 3. Acute Toxicity Criteria for Total Ammonia Nitrogen (Criterion Maximum Concentration)

pH	Salmonids Present	Salmonids Absent
7.0	24.1 mg/L	36.1 mg/L
8.0	5.62 mg/L	8.4 mg/L
9.0	0.885 mg/L	1.32 mg/L

¹ The USEPA published new recommended water quality criteria for ammonia on August 22, 2013. The 1999 criteria are used in this memorandum in order to be consistent with the NPDES permit's reasonable potential analysis that was developed prior to the publication of the 2013 criteria, and due to insufficient time in advance of the scheduled permit adoption hearings to appropriately apply the 2013 criteria.

SUMMARY OF EXCEEDENCES OF WATER QUALITY OBJECTIVES FOR BIOSTIMULATORY SUBSTANCES AND DISSOLVED OXYGEN

Available data and information suggest that harmful biostimulatory conditions are present in the mainstem Laguna and lower Mark West Creek, as demonstrated by elevated amounts of nutrients in the water column and in aquatic sediments, elevated levels of chlorophyll *a*, frequent low dissolved oxygen levels, and the extensive presence of benthic macrophytes (including *Ludwigia* sp.). These reaches, as well as many of their tributaries, are also facing significant water quality problems due to high levels of instream sedimentation, hydrologic and physical habitat changes, and high water temperatures.

The following sections provide evidence of elevated amounts of total nitrogen, total phosphorus, and chlorophyll *a* in the water column; evidence of harmfully low concentrations of dissolved oxygen; and evidence supporting Regional Water Board staff's conclusion that phosphorus is the limiting nutrient controlling biomass production – and thus water quality responses – in the mainstem Laguna and lower Mark West Creek.

Instream Nitrogen Levels Exceed Recommended Criteria for Biostimulatory Substances

Instream water samples for nitrogen compounds have been collected in the mainstem Laguna and other watershed locations since the 1970s. Regional Water Board staff reviewed data and analyses presented by Otis (1990), NCRWQCB (1992), Church and Zabinsky (2005), Sloop et al. (2007), and NCRWQCB (2008), among others, to determine the overall status and trends of total nitrogen levels over time in the greater Laguna de Santa Rosa watershed.

Using data from the studies referenced above, Figure 1 presents total nitrogen concentrations measured in the water column since 1989 at the four TMDL attainment locations established in the Waste Reduction Strategy for the Laguna de Santa Rosa (Morris 1995), which are located in the mainstem Laguna at Stony Point Road, at Occidental Road, and at Guerneville Road, and in lower Mark West Creek at Trenton-Healdsburg Road.

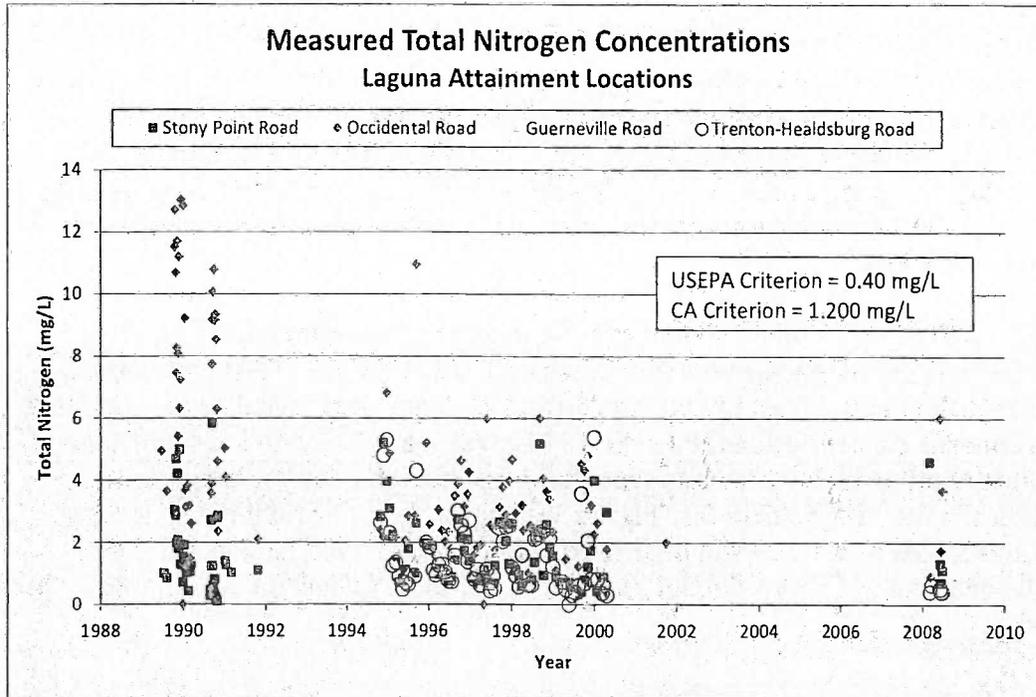


Figure 1. Total Nitrogen Concentrations Measured in the Laguna de Santa Rosa

Data presented in the Figure 1 reveal apparent reductions in total nitrogen concentrations since the late 1980s. However, concentrations measured most recently continue to exceed recommended levels, as summarized in Table 4. In fact, total nitrogen concentrations in 100% of the 42 samples collected and analyzed at the four TMDL attainment locations during the period 2001-2010 exceed the USEPA recommended criterion of 0.40 mg/L, and concentrations in 79% of the samples exceed the California recommended criterion of 1.200 mg/L.

Table 4. Total Nitrogen Concentration Criteria Exceedence Rates in the Laguna de Santa Rosa

Location	Period	# of Samples	Median Total Nitrogen Concentration (mg/L)	Percent Greater than USEPA Criterion (0.40 mg/L)	Percent Greater than CA Criterion (1.200 mg/L)
Laguna TMDL Attainment Locations	1989-1994	84	2.750	93%	76%
	1995-2000	251	1.460	96%	57%
	2001-2010	42	3.235	100%	79%

Instream Phosphorus Levels Exceed Recommended Criteria for Biostimulatory Substances

Instream water samples for phosphorus compounds have been collected in the mainstem Laguna and other watershed locations since the 1970s. Regional Water Board staff reviewed data and analyses presented by Otis (1990), NCRWQCB (1992), Church and Zabinsky (2005), Sloop et al. (2007), and NCRWQCB (2008), among others, to determine the overall status and trends of total phosphorus levels over time in the greater Laguna de Santa Rosa watershed.

Using data from the studies referenced above, Figure 2 presents total phosphorus concentrations measured in the water column since 1972 at the four TMDL attainment locations established in the Waste Reduction Strategy. These data reveal large reductions in total phosphorus concentrations since the 1970s, which are likely due to significant improvements to municipal wastewater treatment facilities and dairy management practices over the last several decades. Figure 3 presents the same total phosphorus concentrations measured since 1984 in order to depict more recent data in a clearer graphic. The data suggest that reductions appear to continue to decline over more recent time periods.

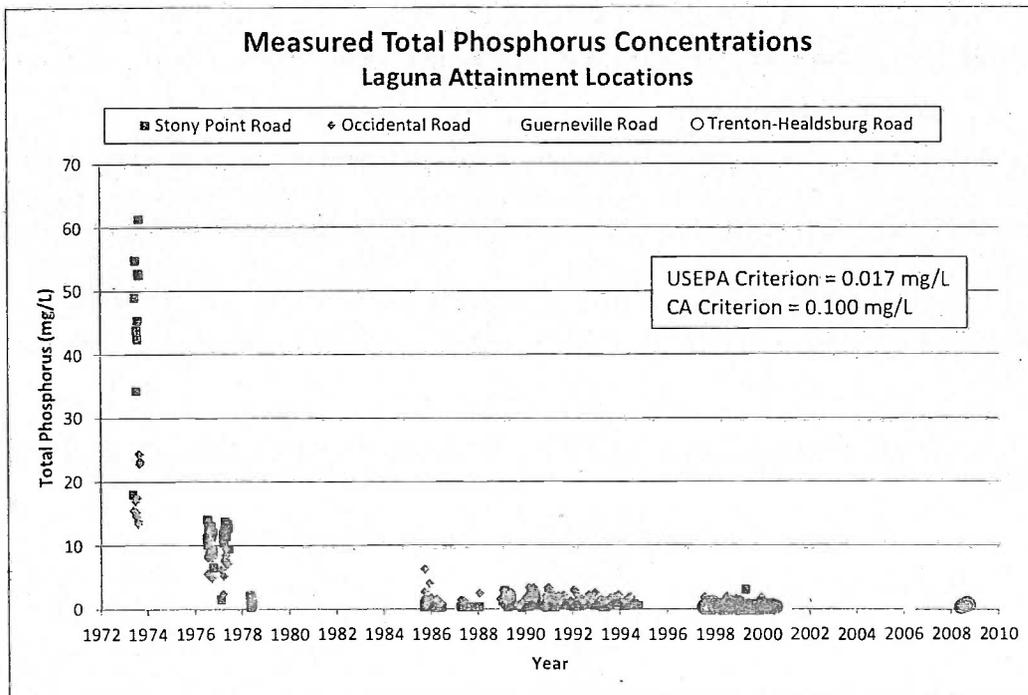


Figure 2. Total Phosphorus Concentrations Measured in the Laguna de Santa Rosa since 1972

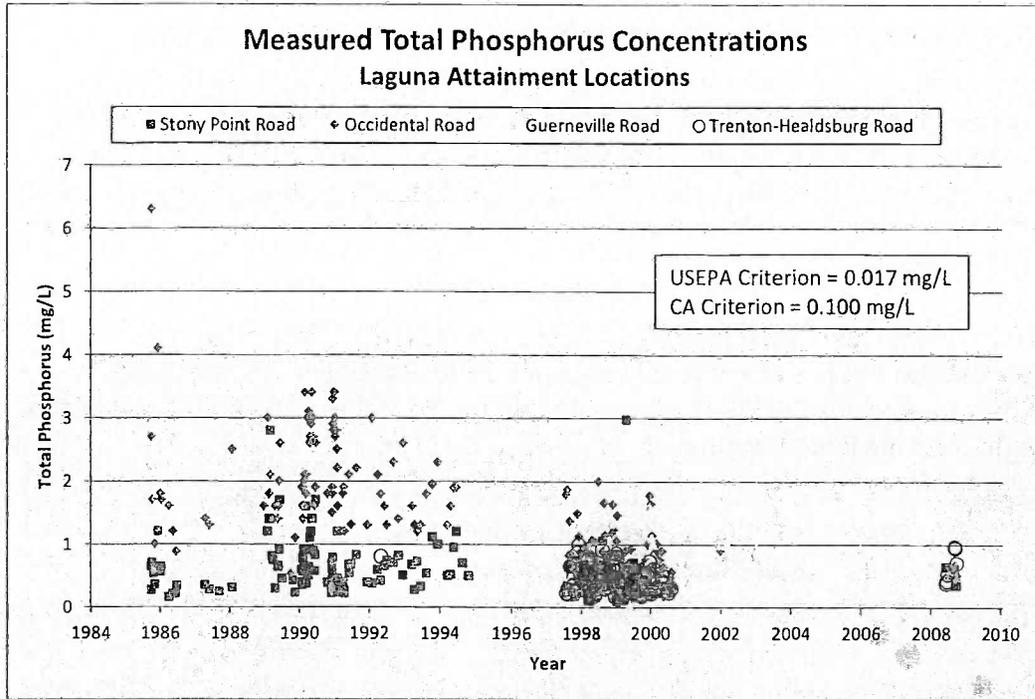


Figure 3. Total Phosphorus Concentrations Measured in the Laguna de Santa Rosa since 1985

While data presented in the above figures indicate substantial reductions in total phosphorus over time, concentrations nonetheless continue to far exceed recommended levels, as summarized in Table 5. In fact, total phosphorus concentrations in 100% of the 43 samples collected and analyzed at the four TMDL attainment locations during the period 2001-2010 exceed both the USEPA recommended criterion of 0.017 mg/L and the California recommended criterion of 0.100 mg/L.

Table 5. Total Phosphorus Concentration Criteria Exceedence Rates in the Laguna de Santa Rosa

Location	Period	# of Samples	Median Total Phosphorus Concentration (mg/L)	Percent Greater than USEPA Criterion (0.017 mg/L)	Percent Greater than CA Criterion (0.100 mg/L)
Laguna TMDL Attainment Locations	1970-1984	81	10.440	100%	100%
	1985-1994	191	1.200	100%	100%
	1995-2000	291	0.430	100%	100%
	2001-2010	43	0.700	100%	100%

Chlorophyll *a* Levels Exceed Recommended Criteria for Biostimulatory Indicators

Instream water samples for concentrations of chlorophyll *a* have been collected in the mainstem Laguna and other watershed locations since the early 1990s. Regional Water Board staff reviewed data and analyses presented by Otis (1990), NCRWQCB (1992), Church and Zabinsky (2005), Sloop et al. (2007), and NCRWQCB (2008), among others, to determine the overall status and trends of chlorophyll *a* over time in the greater Laguna de Santa Rosa watershed.

Using data from the studies referenced above, Figure 4 presents chlorophyll *a* concentrations measured in the water column since 1990 at three of the four TMDL attainment locations established in the Waste Reduction Strategy. (There are no available data for the Guerneville Road location.)

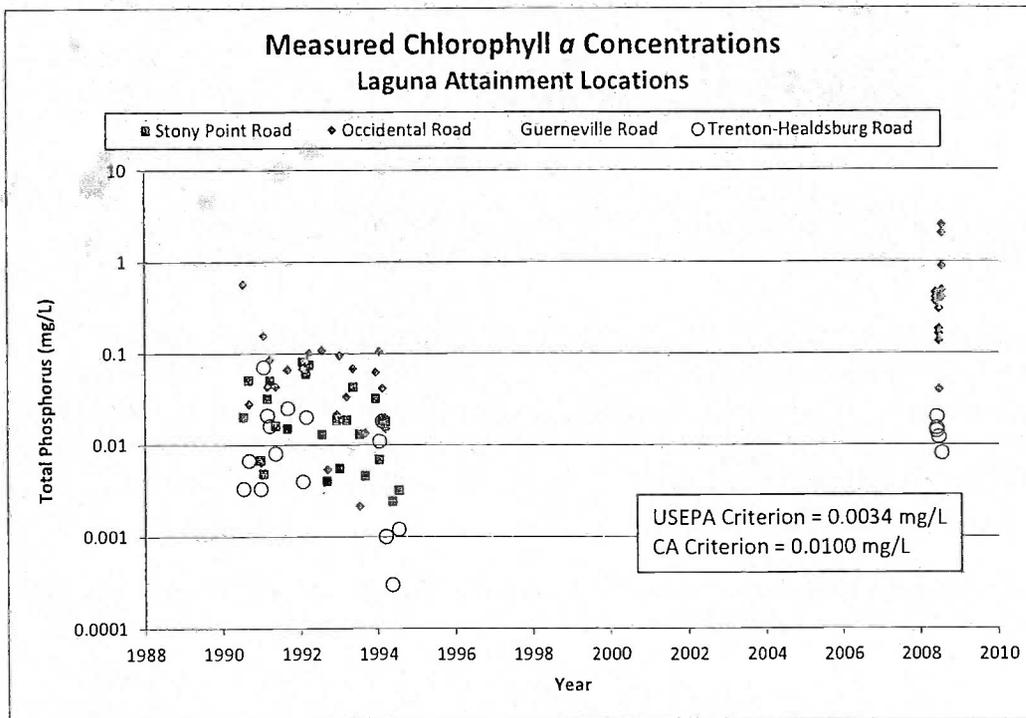


Figure 4. Chlorophyll *a* Concentrations Measured in the Laguna de Santa Rosa since 1990

Data presented in Figure 4 reveal apparent increases in chlorophyll *a* concentrations at Occidental Road since the early 1990s. Additionally, concentrations measured most recently far exceed recommended levels, as summarized in Table 6. In fact, chlorophyll *a* concentrations in 100% of the 20 samples collected and analyzed at two of the four TMDL attainment locations during the period 2001-2010 exceed the USEPA recommended criterion of 0.0034 mg/L, and concentrations in 95% of the samples exceed the California recommended criterion of 0.0010 mg/L.

Table 6. Chlorophyll *a* Concentration Criteria Exceedence Rates in the Laguna de Santa Rosa

Location	Period	# of Samples	Median Chlorophyll <i>a</i> Concentration (mg/L)	Percent Greater than USEPA Criterion (0.0034 mg/L)	Percent Greater than CA Criterion (0.0010 mg/L)
Laguna TMDL Attainment Locations	1990-1994	63	0.0187	87%	70%
	1995-2000	0	---	---	---
	2001-2010	20	0.3300	100%	95%

Dissolved Oxygen Levels Do Not Meet Basin Plan Objectives

Instream water samples for concentrations of dissolved oxygen have been collected in the mainstem Laguna and other watershed locations since the 1970s, although diel (i.e., near-continuous, 24-hour) data for most sites are not available prior to the late 1990s. Diel dissolved oxygen data collected at various monitoring sites in the greater Laguna de Santa Rosa watershed between 1995 and 2011 are presented and analyzed by Butkus (2010) and (2011). Regional Water Board staff assessed these data and analyses, as well as analyses by Sloop et al. (2007), among others, to determine the overall status and trends of dissolved oxygen concentrations over time in the greater Laguna de Santa Rosa watershed.

Using data from the studies referenced above, Figure 5 presents distributions of daily minimum dissolved concentrations measured in the water column at the four TMDL attainment locations, and at Laguna tributary sites. The figure shows that, for the large majority of measurements taken, waters of the mainstem Laguna and lower Mark West Creek regularly fail to meet the minimum Basin Plan water quality objective of 7.0 mg/L, although levels tend to increase as water flows downstream.

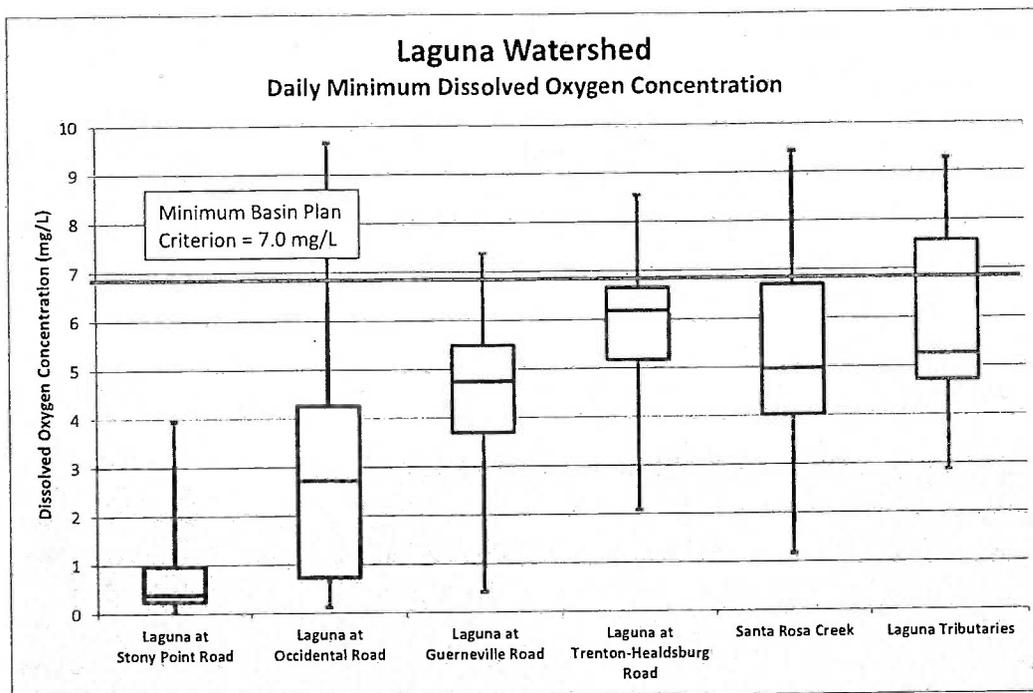


Figure 5. Distribution of Daily Minimum Dissolved Oxygen Concentrations Measured in the Laguna de Santa Rosa Watershed

(Note: Box plots indicate 90th, 75th, 50th, 25th, and 10th percentile concentrations.)

Phosphorus Levels Limit Biomass Production and Cause Harmful Biostimulatory Responses

Where sufficient site-specific data are available, Regional Water Board staff use a combination of research, analysis, and/or modeling to characterize relationships between biostimulatory stressors and observed responses, and if possible, to determine which stressors cause (or control) those responses in a particular water body.

As described below, data and information available for the mainstem Laguna and lower Mark West Creek indicate that, based on current conditions in these water bodies, phosphorus is the primary nutrient stressor that limits algal and macrophytic biomass production, and thus causes harmful biostimulatory responses such as decreases in dissolved oxygen levels.

Regional Water Board staff reviewed available scientific literature regarding nutrient limitations on biomass production (Butkus 2012a), including the *Report to Russian River Watershed Protection Committee and City of Santa Rosa on Phosphate Loading and Eutrophication in the Laguna de Santa Rosa* (Wickham and Rawson 2000) which summarizes the role of dissolved reactive phosphorus (i.e., phosphate) in freshwater ecosystems as follows:

“Limnologists widely regard phosphate as the predominant limiting nutrient for plant production in freshwater ecosystems. While other nutrients

combine with phosphate to fulfill the metabolic needs of plants, such as nitrogen, sulfur, iron, and various other mineral and organic compounds, phosphate is typically the compound that is in lowest availability in free form. Where all available phosphate has been consumed in the course of the production cycle, plant growth stops. This can occur even though all other nutrients, including nitrogen, remain abundant." (p. 1)

Furthermore, regarding the role of nitrogen in the Laguna de Santa Rosa, the report states:

"Nitrogen, however, can never be completely controlled since it is available from numerous other sources, including natural ones. Nitrogen oxides are readily available from polluted air typical of an urbanized area such as the Santa Rosa Plain. Many species of photosynthetic bacteria and blue-green algae are nitrogen fixers capable of drawing nitrogen in molecular form from the atmosphere and incorporating it into plant tissue as they photosynthesize. The attempt to limit nitrogen in the Laguna, while a worthy goal for many reasons, is potentially fruitless if it is the sole nutrient being addressed." (p. 6)

Based on these and similar findings and works cited by Butkus (2012a) and Schindler (2012), and given the widespread presence of nitrogen-fixing plant species such as *Azolla filiculoides* (a native water fern) in the mainstem Laguna and lower Mark West Creek, staff conclude that total phosphorus concentrations limit algal and macrophytic biomass production in these water bodies.

Preliminary TMDL linkage analysis and modeling results by Butkus (2012b) provide further evidence that total phosphorus concentrations drive benthic and planktonic algal biomass production in the lentic and lotic reaches of the greater Laguna de Santa Rosa watershed. Results suggest that linkages exist between instream total phosphorus concentrations, algal biomass, carbonaceous biochemical oxygen demand (CBOD), and sediment oxygen demand (SOD) in the mainstem Laguna and lower Mark West Creek.

According to Butkus (2012b), benthic and planktonic forms of algal biomass contribute to CBOD in the water column, and upon senescence and settling, contribute to SOD. SOD is caused by the oxidation of organic matter in benthic sediments. Sources of organic matter in sediments include leaf litter, soil entering the water body through erosion and deposition, particulate matter from storm water and wastewater discharges, and deposition of algal and macrophytic biomass. Regardless of the source, the oxidation of organic matter in benthic sediments will exert a SOD on the water column, and can drive concentrations of dissolved oxygen to harmfully low levels.

Based on these measured and modeled linkages, Regional Water Board staff conclude that reductions in total phosphorus concentrations are needed to reduce algal (and presumably macrophytic) biomass in these water bodies, which will ultimately lead to lower levels of CBOD and SOD, higher levels of dissolved oxygen in the water column, and a reduced biostimulatory response. Such reductions may be achieved by controlling phosphorus

loads from external sources and by removing or treating internal phosphorus loads, where feasible.

In summary, although the Laguna de Santa Rosa TMDLs are not yet fully developed, evidence is clear that biostimulatory conditions exist and that instream phosphorus concentrations control harmful biostimulatory responses. Currently, the mainstem Laguna and lower Mark West Creek have no apparent capacity to assimilate additional phosphorus loads without continuing to exceed Basin Plan water quality objectives for biostimulatory substances and dissolved oxygen. Regional Water Board staff therefore conclude that reductions in internal and external phosphorus loads to these water bodies are needed to protect their beneficial uses, and to ultimately improve water quality conditions. On the contrary, because phosphorus is the limiting nutrient in these water bodies, reductions in nitrogen loads beyond current levels are not expected to result in added protection of the beneficial uses, or significant water quality improvements.

SUMMARY OF ATTAINMENT OF WATER QUALITY OBJECTIVES FOR TOXICITY

Instream Ammonia Levels Do Not Exceed Toxicity Criteria

Instream water samples for concentrations of ammonia have been collected in the mainstem Laguna and other watershed locations since the 1970s. Regional Water Board staff reviewed data and analyses presented by Otis (1990), NCRWQCB (1992), Morris (1995), Church and Zabinsky (2005), Sloop et al. (2007), and NCRWQCB (2008), among others, to determine the overall status and trends of total ammonia concentrations and ammonia toxicity over time in the greater Laguna de Santa Rosa watershed.

Using data from the studies referenced above, Figure 6 presents total ammonia concentrations measured in the water column since 1989 at the four TMDL attainment locations established in the Waste Reduction Strategy for the Laguna de Santa Rosa (Morris 1995). These data reveal apparent reductions in total ammonia concentrations since the late 1980s.

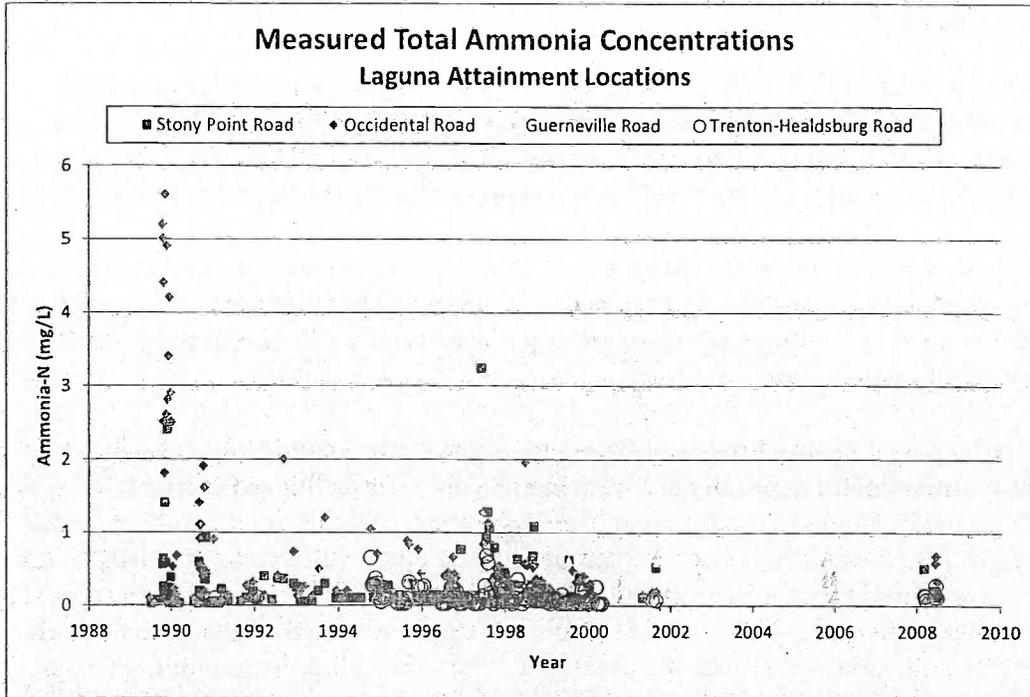


Figure 6. Total Ammonia Concentrations Measured in the Laguna de Santa Rosa since 1989

Regional Water Board staff coupled data presented in the above figure with corresponding (measured or inferred) water column pH values, and evaluated them against the 1999 USEPA recommended criterion for acute ammonia toxicity, assuming the presence of salmonids. None of the measured ammonia concentrations exceeded the acute criterion, as summarized in Table 7. Staff are currently unable to conduct a similar evaluation against the 1999 USEPA criterion for chronic ammonia toxicity, due to lack of sufficiently frequent measurements during the sampled period.

Table 7. Acute Ammonia Toxicity Exceedence Rates in the Laguna de Santa Rosa

Location	Period	# of Ammonia Samples	Median Total Ammonia Conc. (mg/L)	Median pH	Percent Greater than 1999 USEPA Criterion
Laguna TMDL Attainment Locations	1989-1994	139	0.13	7.7	0%
	1995-2000	503	0.10	7.7	0%
	2001-2010	53	0.20	7.78	0%

CRITICAL CONDITIONS

The most critical conditions for dissolved oxygen concentrations and saturation levels - primary indicators of a biostimulatory response - vary spatially along the length of the mainstem Laguna and lower Mark West Creek and also temporally throughout the year. Available data demonstrating these conditions are presented by Butkus (2010) and (2011).

Available data show that dissolved oxygen concentrations and saturation levels generally increase and improve as water flows downstream from the upper portions of the mainstem Laguna toward the Russian River, although most measurements still do not meet the Basin Plan's water quality objectives.

In the greater Laguna de Santa Rosa watershed, the most critical conditions for biostimulatory impairment generally occur in, but are not strictly limited to, the late summer. This is mainly due to the timing of the highest daily maximum air temperatures during the year, which cause higher water temperatures. High water temperatures lower the saturation potential for dissolved oxygen concentrations and increase activity rates for many biochemical processes, which lower dissolved oxygen concentrations even further. This seasonal critical condition is readily observed in data from the mainstem Laguna at Occidental Road with lower dissolved oxygen concentration and saturation values in the summer and higher values in the spring and fall. However, seasonal conditions at other locations vary and show dissolved oxygen concentrations at low levels throughout the year.

HYDRAULIC/HYDROLOGIC PHENOMENA IN THE LAGUNA DE SANTA ROSA WATERSHED

Available evidence suggests that during high flows in the Russian River, the mainstem Laguna and lower Mark West Creek back up, or even flow in reverse, creating conditions that favor the deposition of nutrient-laden solids. Sloop et al. (2007) describe the unique hydrology of these water bodies and conditions under which backwater effects caused by high flows in the Russian River occur. Philip Williams & Associates (2004) describe a geologic outcrop in the area of the Trenton-Healdsburg Road crossing that limits the sediment transport capacity of the mainstem Laguna and lower Mark West Creek. In addition, available stream flow data from the United States Geological Survey (USGS) indicate reverse flows in the mainstem Laguna during at least four separate storm events since 2009, measured as far upstream as the bridge at Occidental Road (USGS Gage No. 11465750).

There are many uncertainties regarding hydrologic phenomena and the dynamics of nutrient fate and transport in the mainstem Laguna and lower Mark West Creek. However, based on available information, it is reasonable to conclude that wastewater discharges of particulate phosphorus into these water bodies can be captured and stored in channels and floodplains, and later become bioavailable to growing aquatic plants. Similarly, it is reasonable to conclude that wastewater discharges of dissolved phosphorus can be captured and stored in the system, as dissolved phosphorus readily adheres to mineral and organic sediments present in the water column, channel bottom, and floodplain at the time of discharge. Any such discharges will contribute to existing biostimulatory conditions in the mainstem Laguna and lower Mark West Creek, and thus further promote harmful biostimulatory responses.

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City of Santa Rosa

July 22, 2013

Via Electronic Mail

Matthias St. John
Executive Officer
North Coast Regional Water Quality Control Board
5550 Skylane Blvd. Suite A
Santa Rosa, CA 95403

RE: Comments regarding Draft Tentative Waste Discharge Requirements and Master Reclamation Permit for the Santa Rosa Subregional Water Reclamation System

Dear Mr. St. John,

The City of Santa Rosa ("City") appreciates the opportunity to comment on the Draft Tentative Waste Discharge Requirements and Master Reclamation Permit for the Santa Rosa Subregional Water Reclamation System ("Draft Order") and its accompanying attachments. The City appreciates North Coast Regional Water Quality Control Board ("Regional Water Board") staff's diligent efforts to improve this Draft Order from the previous version; however, several issues remain that the City requests be addressed before the Draft Order is proposed for adoption, as follows:

- **"No net loading" requirement for total phosphorus (Section IV.A.2.b.i).** The most significant remaining issue in the Draft Order is the continued imposition of a "no net loading" effluent limitation for phosphorus. While the City greatly appreciates removal of this type of requirement for nitrogen, the City believes the same rationale for removal of the nitrogen requirement applies to total phosphorus. In the enclosed comments, the City requests that total phosphorus be similarly regulated by a performance-based mass effluent limitation until completion of the upcoming nutrient TMDL, and that the Nutrient Offset Program, to which the City remains committed, be utilized to offset any nutrient discharges in excess of the performance-based mass effluent limitations for total phosphorus and nitrogen.

This approach will adequately protect the local environment while simultaneously protecting the City's residents and ratepayers from having to expend extremely limited resources on activities that are unlikely to produce measurable water quality benefits in the Laguna de Santa Rosa. The City's contribution of total phosphorus is only approximately 0.11% of the total annual load to the Laguna de Santa Rosa; thus, sound public policy favors conserving the significant public resources that might be

consumed in the process of identifying and implementing nutrient offset projects necessary for strict compliance with a "no net loading" requirement. As stewards of the local environment, the City will, of course, continue pursuing opportunities for nutrient reduction and other watershed improvement projects.

In addition, the City supports the Town of Windsor's comments on the "no net loading" requirement for total phosphorus contained in the draft tentative order for the Town of Windsor.

- **Receiving water limitation for bacteria (Section V.A.2).** Almost equally concerning to the City is the new receiving water limitation for bacteria that prohibits the City from causing bacteriological water quality to be degraded beyond "natural background" levels. This new provision is inherently problematic because "natural background" has not been defined for the receiving waters at issue; thus, compliance will be exceptionally difficult to properly assess. Further, neither the Basin Plan nor the Draft Order sets forth necessary implementation procedures. Finally, due to the fact that the City's treated water is stored in open ponds prior to discharge to receiving waters, compliance with this provision will be complicated given "natural" contributions and conditions that may occur in-pond.
- **Recycled Water Requirements (e.g., Attachment E, Table E-7 and Section X.D.3.ii.b., Attachment F, Section 5.b., and Attachment G, Section B-28).** The City continues to be concerned with the operational, monitoring, and reporting requirements imposed for the City's recycled water programs as unreasonable, unnecessary, or unsupported. For example, the proposed monitoring requirements that require testing for drinking water-related constituents are unnecessary and unreasonable because the City does not operate a potable reuse system and the reclamation system at issue is not directly connected to any drinking water source. Further, daily monitoring of recycled water use sites is also proposed; however, the City has no current capability to comply, and the information to be gathered at the City's expense does not appear to serve an apparent purpose. Details of the City's concerns are provided in Attachments 1 and 2, please review Comments 45, 46, 54, and 68 set forth in Attachment 1, in particular.

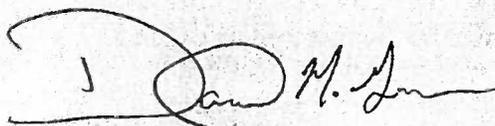
The City presents its comments herein, in the enclosed Attachment 1, and also in the enclosed Attachment 2, which contains the City's December 3, 2012 comments on the previous version of the Draft Order. Please note that in the enclosed Attachment 1, the City presents technical, factual, and legal arguments to support the requested changes noted above, along with new comments to other revised provisions of the Draft Order, and a reiteration of some previous comments in Attachment 2 that have yet to be addressed in the Draft Order. Where comments in Attachment 2 were not expressly reiterated, but are still applicable, the City incorporates those previous comments by reference. The City would appreciate each of its comments being addressed prior to the public hearing on this matter. (*See accord* 40 C.F.R. section 124.17(a).)

Matthias St. John
July 22, 2013
Page 3

Thank you for your careful consideration of the City's comments. We would appreciate scheduling a follow-up meeting with you prior to the proposed hearing date to further discuss the City's comments and Regional Water Board staff's responses.

Please contact Jennifer Burke, Deputy Director Environmental Compliance, at 707-543-3359, to discuss this further.

Sincerely,

A handwritten signature in black ink, appearing to read "David M. Guhin". The signature is fluid and cursive, with a large initial "D" and "G".

David M. Guhin
Director of Utilities

Attachment(s):

1. City of Santa Rosa Comments Regarding Waste Discharge Requirements and Master Reclamation Permit for the Santa Rosa Sub-Regional Water Reclamation Permit
2. City of Santa Rosa Letter – Comments regarding Tentative Waste Discharge Requirements and Master Reclamation Permit for the Santa Rosa Subregional Water Reclamation System, dated December 3, 2012
3. City of Santa Rosa Comments Regarding Waste Discharge Requirements and Master Reclamation Permit for the Santa Rosa Sub-Regional Water Reclamation Permit

ATTACHMENT 1

CITY OF SANTA ROSA COMMENTS REGARDING
WASTE DISCHARGE REQUIREMENTS AND MASTER RECLAMATION
PERMIT FOR THE SANTA ROSA SUB-REGIONAL WATER
RECLAMATION SYSTEM

Comment 1. WDR Page 9, Section IV.A.2.b.i.

“No Net Loading” Effluent Limitation for Total Phosphorus. The City’s Draft Order at Provision IV.A.2.b.i. proposes a final effluent limitation that requires “no net loading of total phosphorus to the waterbodies of the greater Laguna de Santa Rosa watershed” (defined in footnote 4 as the Laguna de Santa Rosa, Santa Rosa Creek, and Mark West Creek hydrologic subareas (HSAs), as mapped in the Basin Plan). Pursuant to Draft Order Provision VII.N., compliance with this effluent limitation will be determined in accordance with the provisions of the Regional Water Board’s Nutrient Offset Program adopted in 2008. The City will be deemed in compliance if its three-year average mass of total phosphorus (TP) discharged to the Laguna de Santa Rosa watershed is less than the amount of TP controlled through the nutrient offset credits for the discharge seasons. As previously stated, the City continues to object to the imposition of the “no net loading” concept as well as to the 303(d) Listings for nitrogen and phosphorus in the Laguna de Santa Rosa for the reasons set forth in the City’s previously submitted December 3, 2012 comments and as set forth below.

The City appreciates removal of the “no net loading” requirement for total nitrogen in favor of a performance-based mass emission rate effluent limitation. (See Draft Order at Section IV.A.2.b.ii) However, it is unclear to the City why TP is not being treated in the same manner as total nitrogen. Instead of a “no net loading” provision, TP should be regulated via a performance-based mass emission rate effluent limitation until or unless wasteload allocations (WLA) are prescribed in an adopted nutrient Total Maximum Daily Load (TMDL) for the Laguna de Santa Rosa.¹ Similar justifications to those provided for the welcomed modification

¹ *In the Matter of the Review on its Own Motion of the Waste Discharge Requirements for the Avon Refinery*, SWRCB Order No. 2001-06 at page 21 (March 7, 2001)(The State Water Resources Control Board (“State Board”) questioned EPA Region IX’s interim permitting “requirements” for no net loading or criterion applied end-of-pipe prior to implementation of a TMDL. (See Draft EPA Region IX Guidance for Permitting Discharges into Impaired Waters in the Absence of a TMDL, <http://www.epa.gov/region09/water/npdes/index.html#draftguidance> (document footer states “DRAFT 5/09/00. Do not cite or quote. Does not represent EPA policy”); see also Letter from USEPA Region IX to Loretta Barsamian, Executive Officer, SFRWQCB (July 22, 1999). This interim permitting guidance was judicially challenged by the Western States Petroleum Association (“WSPA”) and, as part of a settlement agreement, was withdrawn by EPA Region IX. Therefore, and as explained in detail in the City’s December 2012 comments, there is no valid legal foundation for “no net loading.”)

In that same Order, the State Board also confirmed that the approach currently being proposed for total nitrogen (that should also be used for TP) is appropriate, because when a TMDL is complete, “stringent limitations [on point sources] may become unnecessary because non-point source controls may provide assimilative capacity for the point source discharges. This may be especially true in cases [as here] where nonpoint pollutant sources are the primary

of the total nitrogen limit apply equally to TP.² (See Draft Order Fact Sheet at F-52 to F-53, justifying removal of “no net loading” limitation for total nitrogen based on no reasonable potential or other new information). Since there is no reasonable potential for phosphorus included in the Draft Order and no reasonable potential demonstrated for phosphate in Tables F-13 or F-14, the proposed “no net loading” limit for TP can be similarly removed.

As an alternative to the currently proposed “no net loading” requirement for TP, the City offers the following proposal, which more appropriately regulates TP, while preserving the viability and utility of the Regional Water Board’s Nutrient Offset Program, to which the City continues to be committed.

Proposed Revisions to Draft Order:

IV.2.b. The Permittee shall maintain compliance with the following effluent limitations at Discharge Points 006A, 006B, 012A(1), 0012B, and 015, with compliance measured at Monitoring Locations EFF-006A, EFF-006B, EFF-012A(1), EFF-012A(2), EFF-012B, and EFF-001, respectively, as described in the MRP, when discharges occur, until the TMDL related to the following constituents is complete and appropriate WLAs are incorporated into the Permittee’s permit³:

- i. Effluent Limitation for Total Phosphorus for Compliance with Narrative Objective for Biostimulatory Substances.** ~~There shall be no net loading of total phosphorus to the water bodies of the greater Laguna de Santa Rosa watershed⁴. The mass emission rate of the discharge of total phosphorus shall not exceed 10,050 lbs. in the discharge season.~~

Compliance with this effluent limitation shall be determined in accordance with section VII.N.⁴ (Compliance Determination) of this Order.

contributors and point sources are insignificant.” (*Id.* at pages 13-14; *see also* 40 C.F.R. §130.2(i)(If BMPs “or other nonpoint source pollution controls make more stringent load allocations impracticable, then wasteload allocations can be made less stringent. Thus, the TMDL process provides for nonpoint source control tradeoffs.”); *Communities for a Better Environment v. SWRCB*, 109 Cal.App.4th 1089, 1107 (2003)(ultimate control strategy may instead require a “carefully conceived, agency-approved, long-term pollution control procedure for a complex environmental setting.”).)

² The newly included findings for treating phosphorus differently are based on selective parts of a single technical memo, and ignore the other possible biostimulatory substances or factors, such as wind, temperature, sunlight, channel geometry, water flow rates, chlorophyll a, and benthic macrophytes that are included on pages 2-3 of that same memo. Further, the new discussion in the Fact Sheet fails to acknowledge the significant decline in phosphorus levels over time as shown in Figure 2, page 7 of that memo. These findings must be revised to reflect the need for performance-based limits until the nutrient TMDL is complete.

³ This language is consistent with the Reopener Provision in Provision VI.C.1.d, which states that “Following the adoption of these TMDLs, this Order may be reopened and modified to include final WQBELs based on applicable WLAs.” [As a side note, the acronym in Provision VI.C.1.d should be (LAs), not (Las).]

⁴ Please note that this subsection N may change letters if other modifications requested herein are made to this Compliance Determination section.

- ii. **Effluent Limitation for Total Nitrogen for Compliance with Narrative Objective for Biostimulatory Substances.** The mass emission rate of the discharge of total nitrogen shall not exceed 42,028 lbs. in the discharge season.

Compliance with this effluent limitation shall be determined in accordance with section VII.N. (Compliance Determination) of this Order.

- VII.N. 1. For each discharge season (i.e., October 1st through May 14th), the Permittee shall calculate the mass of the total phosphorus and the mass of total nitrogen discharged to the Laguna de Santa Rosa (and tributaries) from the Subregional System ~~and the mass of total phosphorus and total nitrogen that was controlled during the same season through approved nutrient offset projects.~~ If the mass values are equal to or less than the performance-based mass effluent limitations in sections IV.A.2.b.i and ii, then the Permittee shall be in compliance with those effluent limitations.
2. ~~The Permittee shall calculate the three year average mass of total phosphorus discharged to the Laguna de Santa Rosa (and tributaries) from the Subregional System using the discharges (mass basis) that occurred during the previous three discharge seasons.~~ If the mass value for total phosphorus and/or total nitrogen are greater than the mass-based effluent limitations in sections IV.A.2.b.i and ii of this Order, then the Permittee may use nutrient offset credits generated via the Regional Water Board's Nutrient Offset Program, Resolution No. R1-2008-0061 (Attachment H), as follows:
- a. For each discharge season, the Permittee shall calculate the mass of the total phosphorus and/or total nitrogen discharged in excess of the performance-based effluent limitations in sections IV.A.2.b.i. and ii. and the mass of total phosphorus and/or total nitrogen that was controlled during the same season through approved nutrient offset projects.
- b. The Permittee shall calculate the three-year average mass of total phosphorus and/or total nitrogen discharged in excess of the performance-based effluent limitations in sections IV.A.2.b.i. and ii. using the discharges (mass basis) that occurred during the previous three discharge seasons.
- c3. The Permittee will compare the three-year average mass of total phosphorus and/or total nitrogen discharged in excess of the performance-based effluent limitations in sections IV.A.2.b.i. and ii. to the mass of total phosphorus and/or total nitrogen, respectively, controlled during the previous three discharge seasons.
- d4. The Permittee will be determined to be in compliance with the performance-based effluent limitations for final effluent limitation for total nitrogen and total phosphorus if the total nitrogen and total phosphorus controlled through nutrient offset credits for the previous three years discharge season is greater than or equal to the three-year average of total nitrogen and total phosphorus discharged to the

greater Laguna de Santa Rosa (and tributaries) in excess of the performance-based effluent limitations in sections IV.A.2.b.i. and ii.

35. The Permittee shall document compliance with the effluent limitations in the annual report, submitted to the Regional Water Board by July 31st of each year.

Fact Sheet, Page F-52 and F-53, Section IV.D.2. (Satisfaction of Anti-Backsliding Requirements). The City requests the Regional Water Board add phosphorus to the first two paragraphs discussing the removed “no net loading” requirement for total nitrogen, and modify the third paragraph as follows:

The previous Order contained a final effluent limitations for total nitrogen and total phosphorus, expressed as “zero, or no net loading.” These limitations were based on information available at the time the Order was issued about the nature of the nitrogen nutrient impairment of the Laguna de Santa Rosa, and about how the Permittee’s discharges affected that impairment. Regional Water Board staff has since conducted further research and analysis, and has concluded that phosphorus, not nitrogen, is the primary driver of biostimulatory response in the greater Laguna de Santa Rosa watershed is still uncertain and significant reductions in phosphorus completion of a comprehensive TMDL is are necessary to address the impairment. However, because discharges of nitrogen to the receiving water may contribute to short-term algal growth and diel fluctuations in dissolved oxygen in the water column, Regional Water Board staff has determined that nitrogen discharges to the receiving water from the Subregional System should be controlled so as not to increase nitrogen and phosphorus loading at a rates greater than current loadings until the nitrogen nutrient TMDL for the greater Laguna de Santa Rosa watershed is completed. This Order replaces the “zero, or no net loading” limitations for total nitrogen and total phosphorus in the previous Order with a performance-based limitations using updated effluent data from the term of the previous Order. The relaxation of effluent limitations for total nitrogen and total phosphorus in this Order is consistent with CWA section 402(o)(2)(B), because Regional Water Board staff has used new information that was not available at the time the previous Order was issued and which would have justified the application of a less stringent limitations at that time.

Fact Sheet, Page F-53, Section IV.D.1. (Satisfaction of Antidegradation Policy - Surface Water), third paragraph:

This Order includes a final performance based effluent limitations for total nitrogen and total phosphorus. These limitations authorizes the Permittee to discharge up to 42,000~~28~~ pounds of nitrogen and 10,050 pounds of phosphorus in a discharge season. The previous Order contained a final effluent limitations for total nitrogen and total phosphorus of “zero, or no net loading” that would become effective on November 9, 2011, if a WLA had not been established through an approved nitrogen/phosphorus TMDL; thus, this Order seemingly establishes a nitrogen limitations that could allow for an increased nitrogen and phosphorus loading. However, the date of compliance with these limitations was effectively extended to 2015 through a combination of a Time Schedule Order issued by the Regional Water Board Executive Officer and a compliance

methodology detailed in the Permittee's Nutrient Offset Program, as approved by Resolution No. R1-2008-0061 (Attachment H). Consequently, the Permittee has not previously been required to meet the "zero, or no net loading" limitation for total nitrogen and total phosphorus. Thus, establishing these performance-based effluent limitations, in accordance with CWA 402(o)(2)(B), will not result in an increase in nitrogen or phosphorus to surface waters compared to the previous permit and will maintain current loadings until the TMDL is complete and all sources of nitrogen and phosphorus can be properly and equitably addressed.

A. Summary of City's Objections to the New Rationale for Including the "No Net Loading" Effluent Limitation for Total Phosphorus

The Basin Plan contains a narrative water quality objective for biostimulatory substances that states: "*Waters shall not contain biostimulatory substances in concentrations that promote aquatic growths to the extent that such growths cause nuisance or adversely affect beneficial uses.*" (NCRWQCB Basin Plan at 3-3.00 (2011).) In this case, the Regional Water Board has failed to identify that the City's extremely limited discharges to the Laguna de Santa Rosa contain concentrations of TP resulting in nuisance, or an adverse affect on beneficial uses. Without findings or evidence to support that the City's discharge is, in fact, causing such circumstances, regulatory action, such as the imposition of a "no net loading" provision, is unsupported, unreasonable, and contrary to the Basin Plan and law. (See Water Code §§13000, 13263; 40 C.F.R. §124.8(b)(4); *Topanga Association for a Scenic Community v. County of Los Angeles*, 11 Cal.3d 506, 515 (1974); *California Edison v. SWRCB*, 116 Cal. App.3d 751, 761 (4th Dt. 1981); see also *In the Matter of the Petition of City and County of San Francisco, et al.*, State Board Order No. WQ-95-4 at 10 (Sept. 21, 1995). Further, TP discharges from the City's facilities have been substantially reduced over time, and so have levels of TP in the Laguna de Santa Rosa. (See *accord* Memorandum from Rebecca Fitzgerald, TMDL Unit Supervisor entitled "Summary of TMDL development data pertaining to nutrient impairments in the Laguna de Santa Rosa Watershed" (June 14, 2013)(hereinafter "Fitzgerald Memorandum") at pages 7-8, Figures 2 and 3.) Currently, the City's Subregional System discharges only in winter (rather than the summer and/or fall months), when nuisance growths do not pose a threat to waters. As discussed more fully below, Regional Water Board data demonstrates that the Subregional System's estimated phosphorus contribution of *less than 0.2%* of the total annual P-load to the Laguna is so miniscule that further progress towards the "no net loading" concept will not produce any reduction in nuisance plant growths, higher dissolved oxygen levels, or give any other benefits to the Laguna waters. Alternatively, if P is indeed a limiting plant growth nutrient in the Laguna as the Board staff asserts, these types of water quality benefits will not occur until such time that major reductions loads from other sources of TP in the watershed are implemented.

When interpreting narrative objectives, a Regional Water Board must demonstrate "why any effluent limitations . . . are necessary in light of site-specific conditions" in accordance with Water Code sections 13000 and 13377. (See *City of Woodland v. California Regional Water Quality Control Board, Central Valley Region*, Alameda County Superior Court Case No. RG04-188200 (May 16, 2005) at p. 15; State Water Board Order 2004-13, *In the Matter of Petition of Yuba City* at pp. 17-18.). The Regional Water Board's rationale in this circumstance, discussed more fully below, does not support the necessity or technical validity of the proposed "no net

loading” requirement. Further, administrative orders not supported by the findings or findings not supported by the evidence constitute an abuse of discretion. (*See* 40 C.F.R. §124.8(b)(4); *Topanga Association for a Scenic Community*, 11 Cal.3d at 515.). There is also no evidence in the administrative record that the factors set forth in Water Code section 13241 were considered for this interpretation of the narrative objective when the narrative objective for biostimulatory substances was adopted, and there is no evidence that the Regional Water Board considered those factors when preparing the Draft Order in accordance with Water Code section 13263(a). Finally, no implementation plan, as required by Water Code section 13242, has been incorporated into the Basin Plan for compliance with “no net loading” requirements imposed via the narrative water quality objective, even though a City-specific implementation plan is set forth therein, revealing that the “no net loading” provision was not contemplated to apply to the City as a result of the narrative water quality objective for biostimulatory substances.

Most importantly, though, is the City’s concern that strict compliance with the “no net loading” requirement for TP will be difficult and impractical, and that the costs expended to achieve compliance, if possible, will outweigh any benefits (or lack thereof). The Regional Water Board is well aware of the struggles faced to date by the City to identify and implement adequate nutrient offset projects, and to secure Regional Water Board concurrence of project acceptability and offset credit.⁵ While the City is still supportive of the Nutrient Offset Program, and is committed to the Program on a long-term basis, the City is extremely concerned about its ability to successfully use the Program as the sole basis to meet strict and time-sensitive compliance requirements enforceable by, among other things, significant fines and third parties.

The Board Staff’s rationale for requiring a no net loading TP effluent limitation is presented in Attachment F (Section IV.C.a.ii starting on page F-29) and is based on the Fitzgerald Memorandum. The Fitzgerald Memorandum states the need for a TP “no net loading” effluent limitation in the final paragraph (page 12) as follows:

“While there continue to be uncertainties regarding the dynamics of nutrient fate and transport in the mainstem Laguna and lower Mark West Creek, it is likely that winter discharges of phosphorus-laden particles into the water bodies of the greater Laguna watershed are captured and stored in the channels of the mainstem Laguna and lower Mark West Creek to become bioavailable later in the summer. Any such channel deposits therefore are likely to contribute to high levels of sediment oxygen demand, low levels of dissolved oxygen, and continued harmful biostimulatory conditions.”

- i. **The City objects to the assertion that P discharges from the Subregional System in the winter results in an increase in TP in the Laguna in summer, and thus an increase in algae/macrophytes and a decrease in dissolved oxygen.**

⁵ *See, e.g.*, the City’s May 18, 2012 Petition for Review to the State Water Board for a more thorough description of these issues, which does not include the City’s more recent and problematic encounters on the now-abandoned Nunes project..

The Fitzgerald Memorandum's position is that the Subregional System's winter discharge of sediment particles, which may contain phosphorus, adversely affects water quality in summer. The Fitzgerald Memorandum states that these particles discharged in winter contribute to the sediment in the Laguna and release soluble phosphate in summer that contributes to "sediment oxygen demand, low levels of dissolved oxygen, and continued harmful biostimulatory conditions." This position is not supported by the scientific data. The contribution of the Subregional System to the annual loading to the Laguna ecosystem is very small. The Regional Water Board's estimates of TP loading in the Laguna (not presented in the Fitzgerald Memorandum) show that the Subregional System discharge accounts for only 0.11% of the total annual TP load to the Laguna. The City estimates that the Subregional System contributes only 0.03% of the total annual particulate P-loading. Since the Subregional contributions of TP are so small, further reductions of City contributions would not result in any significant water quality improvements (or, if P is indeed a limiting plant growth nutrient in the Laguna as the Board staff asserts, until such time that major reductions in other P sources occur). In addition, the equilibrium saturation concentration for soluble phosphate (PO_4 , the dominant form of P in wastewater) and water residence time of the Laguna in winter do not favor sorption of P onto particles that can sink to the sediment.

- ii. **The City objects to the assertion that total phosphorus is the limiting nutrient that controls algal biomass in the Laguna.**

Regional Water Board staff's conclusion that TP concentrations limit algal biomass in the Laguna is not supported by the data, since the data provided in the Fitzgerald Memorandum show that TP has declined an order of magnitude but similar, large algae reductions have not been documented. In addition, the Regional Board has not provided evidence for nuisance growths of *Azolla* and *Ludwigia* in the Laguna below the discharge nor that *Azolla* and *Ludwigia* existing above the discharge have declined due to TP reductions. The Fitzgerald Memorandum points out that the connection between nutrients and algae in streams is not well understood. Since a relationship between TP and algae in the Laguna has been shown not to exist so far, reductions in the miniscule contribution by the City's system are unlikely to have any effect.

- iii. **The City objects to the assertion that the concentrations of phosphorus in the Laguna are excessive resulting in excessive algal biomass and macrophytes that, in turn, result in low dissolved oxygen.**

The City agrees that the current TP concentrations are elevated relative to the draft water quality guidance criteria proposed for biostimulatory substances. However, as discussed in the Draft Permit Attachment F (Section IV.C.3.a.ii.5, page F35, 3rd paragraph), the values of these water quality guidance criteria for biostimulatory substances have limited meaning if not considered within a larger context that accounts for the complex physical, biological, and chemical interactions occurring within an aquatic system. Such a comprehensive understanding is not available for the Laguna de Santa Rosa and lower Mark West Creek at this time. In fact, the Fitzgerald Memorandum concedes that other factors besides nutrients may also contribute to the algae and dissolved oxygen issues, including "physical factors that influence the mixing and aeration of water, such as wind, temperature, channel geometry, and water flow rates." (Fitzgerald Memorandum at page 2.)

B. Detailed Explanation of the City's Objections to the New Rationale for Including the "No Net Loading" Effluent Limitation for Total Phosphorus

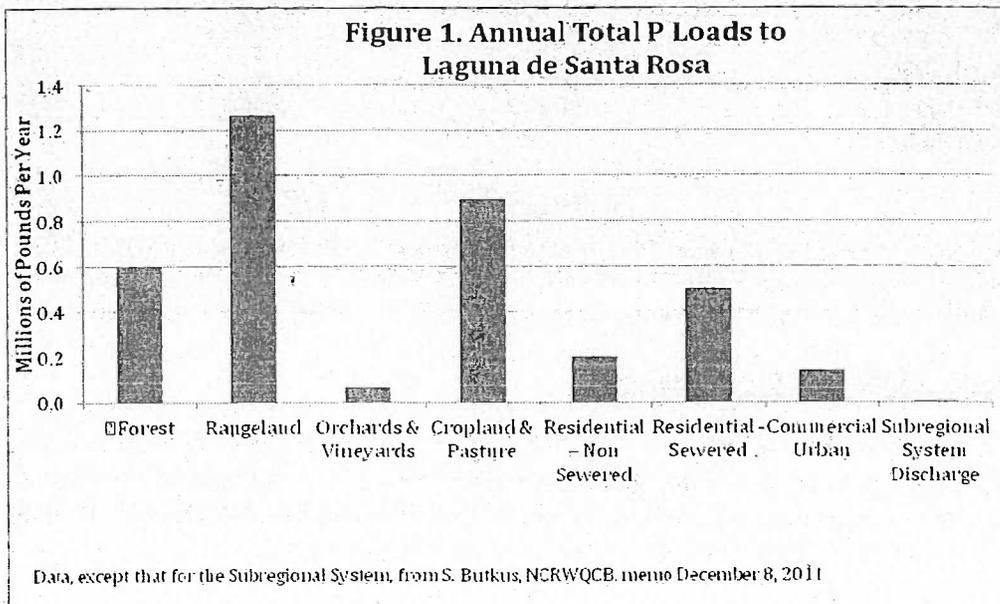
As briefly indicated above, the analyses and conclusions presented in the Regional Water Board's findings and conclusions are, in many cases, suppositions not well supported or not supported at all by data and subject to alternative interpretations. The following are the City's expanded objections to the analyses and conclusions contained in the Fitzgerald Memorandum.

- i. **The City objects to the assertion that P discharges from the Subregional System in the winter results in an increase in TP in the Laguna in summer, and thus an increase in algae/macrophytes and a decrease in dissolved oxygen.**

Total P

The Fitzgerald Memorandum states, "... it is likely that winter discharge of phosphorus-laden particles into the water bodies of the greater Laguna watershed are captured and stored in the channels of the main-stem Laguna and lower Mark West Creek to become bioavailable later in the summer." (Fitzgerald Memorandum at page 12.)

Overall, the Subregional System contributes only 0.11% of the total P loading to the Laguna (see Figure 1; Table 1 below). This amount of TP contributed to the Laguna by the Subregional System discharge is so small (0.11%) that even if it were all removed, no change in TP, aquatic growths or dissolved oxygen would be discernible by any method of analysis. Thus, no water quality benefit or beneficial use improvement would result from the proposed decrease in the Subregional System's 0.11% contribution. Conversely, this data also precludes Regional Water Board from successfully alleging, with findings and evidence, that the existing discharge has any impact on the Laguna de Santa Rosa watershed sufficient to trigger application of the narrative water quality objective for biostimulatory substances.



Particulate P

According to the Fitzgerald Memorandum, particulate P discharged from the Subregional System in winter and retained as sediment in the Laguna is a potential source of P to nuisance growths in summer. The 2001-2006 average soluble (ortho)-P in the D pond and Delta Pond was 1.6 mg-P/L (n=22). For a similar period (2000-2006), particulate-P averaged 2.0 mg/L (n=300). Thus, only 20% of the P in winter discharges from the Subregional System was in the particulate form. However, not all of the TP in the other seven main contributors to the Laguna were likely to have been in the particulate form either. Typical forested flows have a ratio of about 10% soluble-P, 90% particulate-P (Leonard et al. 1979) and a review by Zaimes and Schultz. (2002) states, "In most cases, particulate P is the dominant form of P lost" from rangeland and pasture. An average percentage of about 80% particulate transport for the three main sources of P in the Santa Rosa watershed (rangeland, cropland & pasture, forest) as well as for vineyards and 50% for the other three lesser sources (two forms of residential and commercial-urban), was assumed for purposes of calculating a likely contribution of Subregional System particulate to the total particulate load that may sediment in the Laguna in winter.

Table 1. Best estimate of contributions of various sources of particulate-P in the Laguna watershed. (Source: Data for annual loads of total P to the Laguna from various land uses (except from the Subregional System) derived from acreage of each land use and annual TP loads from each land use (in pounds/acre/year) found in Butkus, 2011. Data for the Subregional System obtained from monthly Self Monitoring Reports.)

Particulate P Source (in descending order of importance)	Annual total P-loading (millions of tons/yr)	Annual sediment P-loading (millions of tons/yr)	Particulate P (% of total particulate-P ¹)
Rangeland	1,264,663	1,011,730	37.7
Cropland & pasture	898,052	718,441	26.8
Forest	599,106	479,285	17.9
Residential: sewered	501,880	250,940	9.4
Residential: non-sewered	199,111	99,556	3.7
Commercial-Urban	137,232	68,616	2.6
Orchards & vineyards	66,690	53,352	2.0
Subregional system discharge	4,139	828	0.03
TOTAL	3,670,872	2,682,748	100.00

¹ Assumes 20% of Subregional System TP is released in the particulate form (measured) and 80% of the rangeland, cropland, and forest TP is released in particulate form (from literature reviews). An intermediate value of 50% TP to phosphate was assumed for the other three lesser sources.

Conversion of Soluble P to Particulate P

The Fitzgerald Memorandum states "...it is likely that winter discharges of phosphorus-laden particles into the water bodies of the greater Laguna watershed are captured and stored in the channels of the mainstem Laguna and lower Mark West Creek to become bioavailable later in the summer." (Fitzgerald Memorandum at page 12, last paragraph.)

Almost all of the total phosphorus released by the Subregional System is in the soluble phosphate (PO_4) form (80%). Sorption of phosphate onto particles depends on many factors including temperature and dissolved oxygen, but is primarily driven by the gradient in concentration between PO_4 in the water and PO_4 sorbed in the particles according to two processes. The first one is a relatively rapid sorption onto the surface of particles. A second process takes PO_4 deeper into the particle's interstices. In the cool winter conditions in the Laguna, the flushing effect of winter flows means that insufficient time is available for the deeper sorption process.

Surface sorption might possibly be a viable method for some of the PO_4 released by the Subregional System to adsorb to particles as proposed in the Fitzgerald Memorandum. However, the uptake rate is controlled by the relative concentrations of PO_4 in water and particle surface, which in the Laguna do not favor uptake. For streams, the maximum equilibrium concentration is about $50 \mu\text{g/L}$ (0.05 mg/L , Froelich, 1988). If the stream water PO_4 concentration exceeds $50 \mu\text{g/L}$, then PO_4 is collected by particles and if less than $50 \mu\text{g/L}$, PO_4 is released from the particles (assuming any has been sorbed previously). Thus, PO_4 in the winter releases from the Subregional System could be slowly sorbed if several days of contact occurs and if unsaturated particles arrive from upstream. However, this scenario seems unlikely here. The temperature is low so equilibrium probably would not be reached before the phosphorus molecules were flushed from the Laguna since travel time in the Laguna is seven hours or less (see Attachment 3) and days of contact time would be required to achieve significant adsorption. More importantly, the soluble phosphorus concentration in the Laguna upstream (estimated as $\sim 0.15 \text{ mg/L}$ or $150 \mu\text{g/L}$) is 3 times the maximum saturation equilibrium concentration. Thus, PO_4 from the Subregional System will not sorb onto particles in significant amounts and the vast majority (of an already very minor contribution) will thus pass from the Laguna and be lost instead of attaching to potential Laguna sediments.

A similar absorption equilibrium argument can be applied to the 20% of particulate total phosphorus released by the Subregional System. Even though most of this particulate total phosphorus released by the Subregional System would also be swept from the Laguna in winter, some fraction could conceivably remain in the sediments, although dominated by the P from the other seven more abundant total phosphorus loading sources in the watershed. The maximum equilibrium concentration of $50 \mu\text{g/L}$ is exceeded for all of the year, not just in winter. Thus, little chance of release in summer exists. This means that more stringently controlling P in the Subregional System's discharge during winter/early spring will not result in water quality improvement under existing conditions.

- ii. **The City objects to the assertion that total phosphorus concentrations limit algal biomass in the Laguna de Santa Rosa.**

Direct Relationships of TP and Biomass in the Laguna

The Fitzgerald Memorandum states "Staff conclude that reductions of phosphorus loads are needed to control the amount of algal biomass production and reduce the adverse effects of eutrophication in the mainstem Laguna and lower Mark West Creek." (Fitzgerald Memorandum at page 9, third paragraph.)

The City agrees that future reductions in total P loadings generally would be necessary to create P-limited conditions in the Laguna. However, the City considers that P-limitation has not been shown at the present time to be needed to control algae and that any model based on this limitation will not be scientifically supportable. The reason that P-limitation is unlikely is the current very high levels of TP in the Laguna. Figures 2 and 3 in the Fitzgerald Memorandum show that, although TP has been substantially reduced over time, current concentrations range from 0.5 to 1 mg/L (assumed average from Figure 3 ~ 0.75 mg/L). The City contends that this is a nutrient-saturating level and is well above the proposed guidance criteria for TP (USEPA = 0.017 mg/L and California = 0.1 mg/L) cited in the Fitzgerald Memorandum. For the maximum possible reduction in the Subregional System's 0.03% (particulate) to 0.11% (total) contributions to P loading to become meaningful, the Board needs to demonstrate that overall reductions will (not may) occur and will reduce phosphorus in the Laguna to limiting levels during the five-year permit period.⁶ Based on the California guidance criterion, an approximately 87% reduction would be needed in total watershed annual TP loading [a reduction of 0.65 mg/L from 0.75 to 0.1 mg/l ($0.65 \times 100/0.75$)] to have a discernible effect on algae and DO. Until such a time that phosphorus loading watershed-wide is reduced to limiting concentrations, reducing or eliminating the small Subregional contribution would be costly and would not yield any discernible water quality benefit.

Indirect and Modeled Connections Between TP and Algae in the Laguna

Regional Water Board staff assert that linkages exist between the total phosphorus concentration, algal biomass, Carbonaceous Biochemical Oxygen Demand ("CBOD"), and Sediment Oxygen Demand ("SOD"). According to the Regional Water Board's assessment, algal biomass contributes to CBOD in the water column, which upon senescence and settling, contributes to the SOD. In the mainstem Laguna and lower Mark West Creek, total phosphorus concentrations are presumed to limit both phytoplankton and benthic algal biomass. Reductions in total phosphorus concentrations are therefore expected to reduce algal biomass, CBOD, and SOD, which are the primary drivers of low dissolved oxygen in the water column. (Fitzgerald Memorandum starting on page 9, paragraph 5)

First, the City does not dispute that linkages may exist between nutrients, algae and/or macrophytes and settled carbonaceous matter. Second, the City agrees with the Fitzgerald Memorandum that there are uncertainties in the linkages between nutrient loadings and nuisance growths and that these are more complicated than in lakes ("While there continue to be uncertainties regarding the dynamics of nutrient fate and transport in

⁶ All Water Board decisions must set forth findings to "bridge the analytical gap between raw evidence and the ultimate decision or order." (*Topanga Ass'n for Scenic Community v. County of LA*, 11 Cal.3d at 515.). Further, an agency must ensure that it "has adequately considered all relevant factors [here, Water Code sections 13000, 13050, 13241, etc.] and has demonstrated a rational connection between these factors, the choices made, and the purposes of the enabling statute." (*Cal. Hotel and Motel Ass'n v. Industrial Welfare Com.*, 25 Cal. 3d 200, 212 (1979).) Thus, the Regional Water Board's proposed effluent limits must be supported by findings, and the findings must be based on evidence in the record. Without proper findings and evidence, any limits would be actionable and constitute an abuse of discretion.

the mainstem Laguna and lower Mark West Creek..." Fitzgerald Memorandum at page 12, 5th paragraph). However, the City thinks these uncertainties are so large that they cannot provide a good scientific basis to require a significant and costly reduction in the small 0.03% estimate of the theoretical contribution from particulate-P or 0.11% from Total P from the Subregional System. The section below discusses 1) the general lack of evidence for the TP-biomass linkage in the Laguna and 2) the theoretical reason why the linkages are not suitable for practical application in terms of showing beneficial effects of 0.11% decline in TP (0.03% decline in particulate P).

Lack of Evidence for the TP-Biomass Linkage in the Laguna

As previously stated, the overall argument made by the Regional Water Board is that effluent released in winter by the Subregional System to the Laguna is responsible for increased algal growth and dissolved oxygen depletion in summer in the Laguna. First, no evidence was presented by Regional Water Board staff that the algal growth has increased over what can typically be expected from a warm, turbid lowland stream in summer. Both Federal and State of California chlorophyll criteria were given in the Fitzgerald Memorandum, but these numerical values were not compared with chlorophyll levels present in the Laguna since 1985, as was done for nutrients (for example, Figures 1, 2, and 3 in the Fitzgerald Memorandum). Second, no evidence was presented by Regional Water Board staff that algal growth has decreased, despite an order of magnitude decline in total phosphorus in the water, which can be attributed the Regional Water Board's efforts to reduce nutrients in the watershed. Since no correlation between total phosphorus and the stated nuisance conditions is presented, the required reductions in discharge by the Subregional System have no basis. Third, the Regional Board has not provided evidence for nuisance growths of *Azolla* and *Ludwigia* in the Laguna below the Subregional System's discharge. By contrast, ample evidence exists document excessive growths of *Azolla* (David Smith, personal observations) and *Ludwigia* (Laguna de Santa Rosa Foundation "Mapped Extent of Ludwigia, 2006 and 2012") above the Subregional System's discharge.

Why the Linkages are Not Suitable for Practical Application

The City's basic case stated earlier is that reducing loads from the Subregional System that equate to 0.03 to 0.11% particulate P and total P, respectively, is not likely to have any measureable effect on either P concentrations in the Laguna or any biological effects of that P. In order to have a meaningful or measurable effect on the Laguna water quality, loading levels would need to be reduced watershed-wide to a level where an effect could be expected, which represents a far greater percentage than the City contributes. This would require considerable reductions in other TP sources and a better demonstration of the link between TP and nuisance growths. Reducing the City's nutrient load is not appropriate until such time that all other, larger loading sources are controlled and shown to improve water quality.

The section of the Fitzgerald Memorandum (starting on page 9, paragraph 5) cited earlier in this section attempts to tie TP to nuisance growths and related undesirable effects, like low dissolved oxygen. However, as mentioned above, no evidence was presented in the Fitzgerald Memorandum that algal growth has decreased, despite an order of magnitude decline in total phosphorus in the water. The likely explanations for the lack of a direct correlation between

nutrients and algae in the Laguna lie in the differences in the growth equations for algae in lentic ecosystems (lakes, reservoirs) and lotic ecosystems. (Horne & Goldman, 1994 pp 236-237 (lentic) and pp 259-262 (lotic)). The basic relationship is shown below:

$$dC/dt = dP/dt \times C - (S + G + Pa + D)$$

In other words,

$$\text{Growth } (dC/dt) = \text{photosynthesis } (dP/dt) \times \text{biomass } (C) \text{ minus losses}$$

The losses are the key items that differentiate still and flowing waters. Losses include S = sinking out of photic zone, G = grazing, Pa = parasitism & disease, and D = natural death. The effect of nutrients is indirect via the rate of photosynthesis.

The key point is that grazing in streams is far more important than in lakes and usually dominates the equation. That means that grazing, not nutrients, is the more likely overall regulator of alga, usually periphyton, in streams. Thus, a model that attempts to link a nutrient like TP to algae in streams will find only a small correlation, if any. Since grazing in streams is more likely correlated with cobble size, temperature, dissolved oxygen, pesticide inputs, sediments and other food sources such as leaves, it cannot be expected that a model will make a very good prediction of stream algae unless these other inputs are added.

In the relatively still conditions of lakes and ponds, reduction of nutrients following their uptake to support the spring bloom is the major control factor for phytoplankton for the rest of the year. Zooplankton grazing becomes important for a short time in some lakes as the water warms and nutrient depletion takes hold. Sinking also becomes important at this time. These three factors (nutrient depletion, algal sinking, and zooplankton grazing) are functions of greater water depth and relatively calm water. In the shallow waters of the Laguna, whether it exists as a small stream or a series of shallow pools linked by groundwater, there is no possibility of permanently sinking, of nutrient depletion by isolation from the bottom, or zooplankton finding a refuge from predation in the mud. In contrast, only if the Laguna were a lake over 20 meters deep (which it is not), sustained thermal stratification would establish in spring and would isolate the deep water nutrients from the surface, prevent sinking algae blooms from being carried back to the surface sunlight, and zooplankton grazing could continue since the deep water would be a refuge.

In running waters, even those with quite low flows, phytoplankton are not common compared with attached algae (periphyton). This is why the State and Federal guidance criteria for algal biomass in streams are expressed per surface area, not by volume as with lakes. The loss variables in the growth equation also are different between lentic and lotic environments. Grazing in streams, usually by aquatic invertebrates like snails, scuds, caddis flies, and midge larvae is much more efficient in streams than in lakes. A demonstration of this is the much greater biomass of stream invertebrates versus that in a similar amount of lake water. One large snail in a stream will weigh more than all the zooplankton in a liter of eutrophic lake (e. g. main large *Daphnia* zooplankton may be only 10 per liter (0.15 mg, Wetzel, 2003 p. 440) while even a small river snail or caddis fly can weigh several grams (Kocherina, 1989). Low nutrient streams usually contain several snails, many worms and larvae of midges and other aquatic insect in 0.1 m² of stream bottom (Horne & Goldman, 1994 p 382 and Truckee River Reports, 1973-1981).

Many experiments over the last 40 years have clearly demonstrated that even the most oligotrophic streams with almost no nutrients can have very extensive growths of periphyton – so long as grazing is low. An illustration of this is shown in Figures 2a and 2b that shows attached algae in a high Sierra stream in Kings Canyon National Park (approximately 1 mile below Pinchot pass, and approximately 16 trail miles from the nearest road). Low grazing in streams can occur if the benthic substrate is unsuitable (muddy, anoxic, no cover for insects to hide in the daylight hours, no upstream colonization to supply new insects as they drift downstream each night). Grazing insects can remove even dense periphyton growths almost overnight if the temperature is suitable and predation refugia in the cobbles are plentiful, even when nutrients are in ample supply. This was most clearly shown in California in the long-term research studies on the Truckee River sponsored in part by the State Water Resources Control Board in the 1970s, prior to the construction of the Tahoe-Truckee Sanitation Agency wastewater treatment plant (Truckee River Reports, 1973-1981).

The contribution of particulate P from the Subregional System winter discharge is small (best estimate 0.03%, see below) compared to at least four of the seven identified P-sources and perhaps to all seven of them as described in Table 1 and Figure 1 above. Given the very weak linkage between total phosphorus and the stated nuisance conditions, no statistically or ecologically significant effect is expected to result from further reductions in the Subregional System's winter discharges.



Figure 2a. Abundant attached algae in stream in Kings Canyon National Park, approximately one mile below Pinchot Pass (elevation approximately 12,100 ft.) and approximately 16 trail miles from the nearest road.



Figure 2b. Close up of attached algae in the stream shown in Figure 2a.

- iii. **The City objects to the assertion that the concentration of phosphorus in the Laguna de Santa Rosa is excessive, resulting in excessive algal biomass and macrophytes that, in turn, result in low dissolved oxygen.**

The Fitzgerald Memorandum section "Summary Of Exceedances Of Water Quality Objectives For Biostimulatory Substances" (beginning on page 5) provides data on total phosphorus levels in the Laguna. This data showing the concentrations of total phosphorus in the Laguna at four locations is compared to the USEPA and California State Biostimulatory Substances guidance criteria for total phosphorus. Although the concentrations of total phosphorus in the Laguna are elevated relative to these unpromulgated guidance criteria, much uncertainty exists as to the applicability of these criteria to the water quality in the Laguna. In particular, the effect of a reduction of only 0.03% (particulate) or 0.11% (total) P-loading is questionable as a management strategy to attempt to attain these criteria in the Laguna. As stated in the Draft Order Attachment F (Section IV.C.3.a.ii.5, page F35, 3rd paragraph):

"Recommended numeric criteria for biostimulatory substances exist (See Tables F-4 and F-5), but the values of those criteria have limited meaning if not considered within a larger context that accounts for the complex physical, biological, and chemical interactions occurring within an aquatic system. Such a comprehensive understanding is not available for the Laguna de Santa Rosa and lower Mark West Creek at this time. Furthermore, recommended criteria for total phosphorus differ by an order of magnitude, which suggests that there is no agreement about which water quality criterion would be fully protective of beneficial uses."

In this case, excessive biomass and macrophytes would remain exactly as they are now with or without the very small Subregional System contribution; thus, the City's minor phosphorus discharges cannot be the cause of excessive algal biomass and macrophytes, or low dissolved oxygen conditions.

Because of the scientific, factual, and legal issues raised herein, the City respectfully requests that the proposed changes to the phosphorus requirement detailed at the beginning of this comment be made prior to permit adoption.

OTHER COMMENTS - WDR

The following comments are submitted in order of appearance in the Draft Order for ease of the Regional Board staff and should not be taken as an indication of the order of importance of these comments.

Comment 2. Separate the NPDES Permit from the Master Reclamation Permit/WDRs.

The City's discharge and reclamation activities should be regulated in *two separate permits*, with the City's limited and intermittent discharges to waters of the United States regulated by a federal NPDES permit, and the remainder of the City's reclamation or other activities regulated by a Master Reclamation Permit (Water Code section 13523.1) and/or Waste Discharge

Requirements (Water Code section 13263) issued pursuant to state law, namely the Porter-Cologne Water Quality Control Act. While the City greatly appreciates Finding II.C. in the Draft Order, the City is concerned that there are other state law-only requirements contained in the Draft Order not identified in this Finding, such as all of Attachment F's Fact Sheet and Attachment G. Further, and more importantly, by including state law-only requirements in an NPDES permit, those provisions may be inappropriately subject to third party enforcement under the Clean Water Act notwithstanding Finding II.C. The City has been subjected to third party citizen suit enforcement more than once, and would like to ensure that only provisions required to be implemented under the federal Clean Water Act are included in the City's NPDES permit. Other permittees in California have made this request for similar reasons, and had their NPDES/WDR permits separated into two separate permits. (*See accord* Order Nos. R5-2007-0038 (WDR) and R5-2007-0036 (NPDES).)

Comment 3: WDR Pages 1 and 2, Tables 2.a. and 2.b.

Distribution Points. The City appreciates the modification and separation of the discharge locations and reclamation sites in Tables 2.a. and 2.b. However, the Draft Order continues to refer to "Discharge Point," when it should now reference "Distribution Point." The following are some of the locations where this needs to be changed: Fact Sheet, page F-6, Section II.A.4., first paragraph, third line and second paragraph, second line; page F-9 Section II.B.4, first paragraph, third line, and last line; page F-59, Section IV.G.3; page F-66, first line.

The City suggests that a global search for "Discharge Point" be made and that this term be changed to "Distribution Point" whenever the text is referring to recycled water deliveries.

Comment 4. WDR Page 3, Table 3.

Effective Date. This table currently has the Order's effective date as November 1, 2013 and the expiration date as October 31, 2018. Pursuant to the NPDES Memorandum of Agreement between the U.S. Environmental Protection Agency and the California State Water Resources Control Board (Sept. 22, 1989) at page 22, section II.F.2, the permit should be effective on the 50th day after the date of adoption. Thus, because the Draft Order at page 3, Table 3, states that the permit will be adopted on August 22, 2013, the effective date should be set 50 days later, on October 11, 2013, not November 1, 2013 as currently stated. The expiration date should also be modified accordingly. The City requests the effective date be modified to be 50 days from the adoption date, whether or not the permit is adopted as scheduled on August 22, 2013.

Proposed Revisions to Draft Order

Table 3. Administrative Information

This Order shall become effective on:	November 1, 2013 <u>October 11, 2013</u>
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Proposed Revisions to Draft Order

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Comment 5. WDR Page 3.

Enforcement/Stay Provisions. On page 3 of the Draft Order, the Regional Water Board orders that the City's previous NPDES permit and associated monitoring program be superseded, yet in subsequent sentences states the following:

“This action in no way prevents the Regional Water Board from taking any enforcement action for past violations of the previous permit. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Permittee shall comply with the analogous provisions of Order No. R1-2006-0045, Order No. R1-2008-0091, and MRP No. R1-2006-0045, which shall remain in effect for all purposes during the pendency of the stay.”

The above-quoted language is inconsistent with other similar permit language around the State, which does not decouple the superseding/rescission concept from enforceability of the previous permit. The newly proposed language in the Draft Order regarding compliance with earlier, superseded provisions upon the issuance of a temporary stay has no legal basis (neither the Water Code nor Chapter 6 of Title 23 of the California Code of Regulations prescribe or sanction this concept, *and federal regulations on this point are inapplicable to the State*), and is unsupported by the Fact Sheet. In addition, the proposed language may be problematic since there may not be any “analogous provisions” of the previous orders to the provisions that might be stayed. Further, pursuant to Cal. Water Code section 13167.5, a rescinded or superseded permit cannot be revived without an additional hearing and order of the Regional Water Board. Where contested provisions of a permit are temporarily stayed by the State Water Board in accordance with 23 C.C.R. §2053 (along with any unseverable, uncontested provisions), those provisions are not enforceable until the stay is lifted; however, a permittee must continue to comply with the remaining, non-stayed permit provisions, and rescinded or superseded provisions are not automatically revived. For these reasons, the proposed language in the Draft Order should be modified.

Proposed Revisions to Draft Order:

The first and third sentences of this section should be combined to state:

“IT IS HEREBY ORDERED, that this Order supersedes and rescinds Regional Water Quality Control Board (Regional Water Board) Order No. R1-2006-0045, Order No. R1-2008-0091, and Monitoring and Reporting Program (MRP) No. R1-2006-0045, upon the effective date specified in Table 3, except for enforcement purposes. In order to meet the provisions contained in division 7 of the California Water Code (Water Code) (commencing with section 13000) and regulations and guidelines adopted thereunder, and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Permittee shall comply with the requirements of this Order. ~~This action in no way prevents the Regional Water Board from taking any enforcement action for past violations of the previous permit. If any part of this Order is subject to a temporary stay of enforcement, unless otherwise specified, the Permittee shall comply with the analogous portions of Order No. R1-2006-0045, Order No. R1-2008-0091, and~~

MRP No. R1-2006-0045, which shall remain in effect for all purposes during the pendency of the stay.

Alternatively, this entire section should be replaced with language comparable to language used in other regional permits (*see accord* City of Pacifica permit, Order No. R2-2012-0002; Arcata permit, Order No. R1-2012-0031; Rio Dell permit, Order No. R1-2011-0054; Redway CSD, Order No. R1-2011-0046), which states:

“IT IS HEREBY ORDERED, that Order No. R1-2006-0045, Order No. R1-2008-0091, and Monitoring and Reporting Program (MRP) No. R1-2006-0045 are rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Permittee shall comply with the requirements in this Order.”

Comment 6. WDR Page 6 (and throughout), Section III.H.

Inaccurate References. In Section III.H., the Draft Order references an incorrect section. Instead of section VII.L., this provision should reference VII.M (unless other modifications to this section are made as requested herein and the lettering changes). Other internal references should also be re-reviewed to ensure that they are accurate given the numerous modifications made to the Draft Order.

Comment 7. WDR Page 7, Section III.J.

USGS Gage Number. The gage number for gage at Hacienda Bridge is not listed as done for previous permits. To prevent possible future confusion, the City requests that the USGS gauge number be included.

Proposed Revisions to Draft Order:

J. During the period from October 1 through May 14 (discharge season), discharges of advanced treated wastewater to the unnamed ditch, the Laguna de Santa Rosa or Santa Rosa Creek, tributaries to the Russian River, shall not exceed five percent of the flow of the Russian River, as measured at the Hacienda Bridge (USGS gauge No. 11-4670.00)

Comment 8. WDR Page 7, Footnote 1 (and throughout).

Definition of Advanced Wastewater Treatment. Footnote 1 on page 7 of the Draft Order includes a definition of advanced treated wastewater; however, this definition ignores State Water Board precedent. Pursuant to Water Code section 13360(a), no waste discharge requirement or other order of a Regional Board shall specify the design, location, type of construction, or particular manner of compliance for that requirement or order. This issue has been litigated against regional boards previously. To avoid running afoul of this statutory requirement, the City requests that the term “equivalent treatment” be included in the Draft Order as noted below. (*See In the Matter of the Own Motion Review of City of Woodland,*

SWRCB Order No. 2004-0010 at pg. 10; *see also City of Woodland v. Central Valley Regional Water Board*, Alameda Superior Court Case No. RG04-188200, Statement of Decision (May 16, 2005) at pg. 8.) Thus, the language in footnote 1, and wherever else in the Draft Order that advanced treated wastewater or tertiary treatment is referenced, should be modified to be consistent with state law and SWRCB orders.

Proposed Revisions to Draft Order:

Page 7 - ¹ Advanced treated wastewater shall be adequately oxidized, filtered, and disinfected or equivalent as defined in title 22, division 4, chapter 3, of the California Code of Regulations.

Page E-36 - ⁵ Tertiary Recycled Water means “disinfected tertiary 2.2 recycled water” as defined by CDPH or equivalent, or wastewater receiving advanced treatment beyond disinfected tertiary 2.2 recycled water.

Page F-58 - The Order included other requirements for discharges from the Subregional System for filtration that reflect the title 22 requirements for disinfected tertiary or equivalent wastewater to ensure an essentially pathogen-free effluent.

Page F-59 - **3.a. Tertiary Treatment.** This Order defines advanced treated wastewater as wastewater that has been adequately oxidized, filtered, and disinfected or equivalent, as defined in title 22, division 4, chapter 3, of the California Code of Regulations.

Comment 9. WDR Page 8, Sections IV.A.1.b.ii and iii and Sections IV.C.2.b.ii and iii.

Definition of Daily Result. The City assumes that footnote 2 applies to the daily results referred to in Sections IV.A.1.b.ii and iii.a, and therefore requests that this be indicated in these sections. This comment also applies to footnote 5 for Sections IV.C.2.b.ii and iii.

Proposed Revisions to Draft Order:

Section IV.A.1.b.

- ii. The number of coliform bacteria shall not exceed an MPN of 23 per 100 mL in more than one daily result² in any 30-day period.
- iii. No one daily result² shall exceed an MPN of 240 total coliform bacteria per 100 mL.

Section IV.C.2.b.

- ii. The number of coliform bacteria shall not exceed an MPN of 23 per 100 mL in more than one daily result⁵ in any 30-day period.
- iii. No one daily result⁵ shall exceed an MPN of 240 total coliform bacteria per 100 mL.

Comment 10. WDR Page 9, Section IV.A.2.a Table 5, and Attachment F, Pages 133 and 134 Tables F-8 and F-9

Daily Maximum Water Quality Based Effluent Limitations. The Draft Order in Table 5 (and in Tables F-8 and F-9) contains Maximum Daily effluent limits for Chlorodibromomethane and Dichlorobromomethane. Federal law only authorizes monthly and weekly average effluent limitations for publicly owned treatment works (“POTWs”) without a demonstration that such effluent limitations are “impracticable.” (See 40 C.F.R. §122.45(d)(2) (“For continuous discharges all permit effluent limitations, standards and prohibitions, including those necessary to achieve water quality standards, shall unless impracticable be stated as: (2) Average weekly and average monthly limitations for POTWs.”).⁷) The Draft Order includes not only average weekly and average monthly limits, but also includes these maximum daily limits. (See Table 4.) These proposed limits are more stringent than required by federal law and have not been adequately justified.

California courts have already held that such limits are not allowed unless monthly and weekly limitations are demonstrated to be impracticable, and these decisions are binding on the Water Boards since not appealed. (See *City of Burbank v. State Water Resources Control Board*, 35 Cal. 4th 613, 623, n.6 (2005)(The Supreme Court held: “Unchallenged on appeal and thus not affected by our decision are the trial court’s rulings that... (2) the administrative record failed to support the specific effluent limitations; (3) the permits improperly imposed daily maximum limits rather than weekly or monthly averages;...); *City of Woodland v. Central Valley Regional Board*, Alameda County Superior Court, Case No. RG04-188200, Order Granting Writ of Administrative Mandamus at 20 (“Respondents did not show, in either the Order or Permit, that stating effluent limits in terms of weekly and monthly averages was impractical.... Respondents are to either state all effluent limitations as average weekly and average monthly discharge limitations, or, in the alternative, to either demonstrate that such limitations are impractical or that there is a legal basis for imposing other than weekly or monthly average discharge limitations.”) (emphasis added).)

Because no additional analysis has been done to demonstrate impracticability, the Regional Water Board must remove the daily maximum limits. Further, implementing these limits, which

⁷ Case law applies this rule to all constituents, not just human health-based limits, but even those that have the ability to be acutely toxic to aquatic life. In the case of *City of Ames, Iowa*, EPA Environmental Appeals Board, NPDES Appeal No. 94-6 (Apr. 4, 1996), EPA contended that a maximum daily limit for ammonia may be imposed because it is impracticable to meet water quality standards by using an average weekly limit. The hearing officer determined that EPA’s contention was not well founded, as it is practicable to meet water quality standards using an average weekly limit for ammonia. The decision stated that this issue of fact was relevant to the pertinent decision in that the use of the maximum daily limit in the NPDES permit may have the effect of unreasonably increasing the risk of non-compliance with a resulting substantial increase in operating costs to avoid non-compliance. The hearing officer determined, “as the regulation makes clear, the Regional Administrator does not have unlimited discretion to include daily limits; maximum daily limits may be included in a permit for a POTW only if weekly average limits are impracticable.” On remand, the Regional Administrator was directed to reconsider the factual issue of whether it would be practicable to state the effluent limitations as weekly and monthly averages. If it would be practicable, then such averages were to be included in the permit and the daily maximum and instantaneous limits should be removed and replaced with weekly averages. This decision is binding upon EPA Region IX, and thus its delegated state agencies.

are based on long-term chronic human health criteria meant to protect against 70 years of exposure drinking the water and eating organisms from the receiving waters, as short term Daily Maximum values is “incorrect because the criteria guidance value, as previously stated, is intended to protect against chronic effects.” (See Woodland Order, SWRCB Order No. WQ 2004-0010 at 15; see also SIP at 10 (stating only for aquatic life criteria that “[f]or this method only, maximum daily effluent limitations shall be used for publicly-owned treatment works (POTWs) in place of average weekly limitations” - no similar language is included for human health criteria).)

Proposed Revisions to Draft Order:

Table 4. Technology-Based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Chlorodibromomethane		0.4	---	1.0 ---	---	---
Dichlorobromomethane		0.56	---	1.3 ---	---	---

Comment 11. WDR Page 10, Section IV.A.2.b.iii.

Whole Effluent Toxicity Effluent Limitations and Requirements. The Draft Order includes several mechanisms to prohibit toxicity in the City’s discharges. Section IV.A.2 of the Draft Order (*Effluent Limitations and Discharge Specifications*) contains effluent limitations for all toxic pollutants that have the reasonable potential to cause or contribute to an exceedance of water quality standards, both numeric and narrative. These pollutant-specific limitations are intended to ensure that no known toxic pollutants are discharged in toxic amounts. In addition to chemical-specific effluent limitations, the Draft Order also includes Whole Effluent Toxicity (WET) monitoring and reporting requirements in the MRP on pages E-11 to E-17, intended to detect and report the effects of any other unknown pollutants, as well as any combined effects from various pollutants that may cause toxicity to receiving water organisms. Finally, Section V.A.11 of the Draft Order (*Receiving Water Limitations*) states that the discharge shall not cause “toxic substances in concentrations that are toxic to, or that produce detrimental physiological responses in humans, plants, animals, or aquatic life....” (See accord SWRCB Order No. WQ 2008-0008 at 3-4.)

The evidence demonstrates that there is no reasonable potential to trigger the need for an acute toxicity effluent limitation, which is proposed in the Draft Order. (See Draft Order at page F-47 and F-48 (“The Permittee consistently maintained compliance with the acute toxicity limitations during the term of the previous permit. All acute toxicity testing results during the term of the previous permit were 100 percent survival.”)(emphasis added).) If no reasonable potential exists, no effluent limitation is required. (40 C.F.R. §122.44(d)(1)(i) and (iv); SWRCB Order No. WQ 2003-0012 at 16; Fact Sheet, page F-19, Section IV.) Furthermore, a reopener is contained in the Draft Order in case reasonable potential is demonstrated in the future. (See

Draft Order Provision VI.C.1.c.) For these reasons, Provision IV.A.2.b.iii and Provision VII.K. should be removed⁸ and the other Toxicity Requirements in the Draft Order should be modified as follows:

Proposed Revisions to Draft Order:

- 1) Remove current Provision V.A.2.b.iii.
- 2) ~~Effluent Limitation for Acute Toxicity. There shall be no acute toxicity in treated wastewater discharged to the Laguna de Santa Rosa or Santa Rosa Creek. The Permittee will be considered in compliance with this limitation when the survival of aquatic organisms in a 96-hour bioassay of undiluted effluent complies with the following:
 - (a) Minimum for any one bioassay: 70 percent survival; and
 - (b) Median for any three or more consecutive bioassays: at least 90 percent survival.~~

~~Compliance with these effluent limitations shall be determined in accordance with section VIII.K. (Compliance Determination) of this Order.~~

- 2) Remove current Provision VII.K.
- 3) Modify Provision VII.L. (which would now be lettered K.) [This would replace current Provision VII.L.⁹]

Toxicity Requirements. For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Permittee to conduct acute and chronic whole effluent toxicity (WET) testing, as specified in Provision VI.C.2.a.¹⁰ and in the Monitoring and Reporting Program (MRP, Attachment E, section V). This Order includes procedures for accelerated chronic toxicity monitoring and TRE initiation in the MRP. Furthermore, this Order requires the Permittee to investigate the causes of, and identify corrective actions to reduce or eliminate chronic whole effluent toxicity.

Compliance with the following accelerated monitoring and TRE provisions shall constitute compliance with Receiving Water Limitation V.A.11., and the water quality objective for toxicity:

⁸ Removal of this effluent limitation is authorized for the same reasons set forth on pages F-16 and F-52 of the Draft Order for the removal of limits for copper, lead, nickel, cyanide and nitrate, namely new information that there is no longer reasonable potential for acute toxicity.

⁹ There was no need for Compliance Determination Section VII.L. related to "Chronic Toxicity Triggers" since there is no effluent limitation for chronic toxicity.

¹⁰ Provision VI.C.2.a.i. will also need to be amended to remove "In addition to a numeric limitation for whole effluent toxicity,..." and "if either of the effluent limitations for acute toxicity is exceeded (as single sample with less than 70% survival or a three sample median of less than 90% survival) or" in order to be consistent with the other requested changes. The corresponding parts of the Fact Sheet at Attachment F will also need to be modified.

If the discharge exhibits chronic toxicity, by exceeding the monthly median trigger of 1.0 TUC (where TUC = 100/NOEC) or the single sample trigger of 1.6 TUC, the Permittee is required to initiate accelerated monitoring and potentially a TRE in accordance with an approved TRE Workplan, and take actions to mitigate the impact of the discharge and prevent recurrence of toxicity. The monitoring triggers are not effluent limitations, but are the toxicity thresholds at which the Permittee is required to begin accelerated monitoring and possibly initiate a TRE when the effluent exhibits toxicity. A TRE is a site-specific study conducted in a stepwise process to attempt to identify the source(s) of toxicity and to determine effective control measures for effluent toxicity. TREs are designed to identify, where possible, the causative agents and sources of effluent toxicity, evaluate the effectiveness of the toxicity control options, and confirm the reduction in effluent toxicity.

- 4) **Remove first paragraph of Fact Sheet Section IV.C.5.a., Acute Aquatic Toxicity.**
- 5) **Modify Fact Sheet Section IV.C.5.b., Chronic Aquatic Toxicity.** The second to the last paragraph in this section must be modified as follows since it is inconsistent with the findings of the State Water Board that toxicity triggers are not equivalent to effluent limitations:

“Because no dilution has been granted¹¹ for the chronic condition, chronic toxicity testing results exceeding 1.6 TUC as a single sample result and 1.0 TUC as a monthly median demonstrates that the discharge is in violation of the narrative toxicity water quality objective triggers the need for accelerated monitoring to confirm the existence of persistent toxicity.

Comment 12. WDR Page 1,1 Sections IV.C.2.a. and IV.C.2.b and Attachment E Table E-7.

Reclamation Specifications. In the initial draft of the Draft Order, the reclamation specifications stated that water used for reclamation should meet the technology-based effluent limitations contained in section IV.A. The City commented on this issue in the City’s December 3, 2012 Comment Letter (Comment 15), stating that effluent limitations designed for discharge should not be applied to reclamation. The Regional Water Board responded to Comment 15 by adding the same effluent limitations found in Section IV.A. to Section IV.C.2 as reclamation specifications. However, it should be further clarified that these reclamation specification are *not effluent limitations* and are not subject to mandatory minimum penalties under Water Code section 13385. In addition, Section IV.C requires compliance with Title 22, and the requirements in Section IV.C are currently inconsistent with Title 22. Since Title 22 does not

¹¹ Please see the City’s other comments on the abuse of discretion for not granting dilution. Many dischargers in California get dilution for chronic toxicity.