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DIVISION OF WATER QUALITY

**WATER QUALITY ORDER NO. 2013-0002-DWQ
GENERAL PERMIT NO. CAG990005**

**STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
(NPDES) PERMIT FOR RESIDUAL AQUATIC PESTICIDE DISCHARGES TO WATERS OF
THE UNITED STATES FROM ALGAE AND AQUATIC WEED CONTROL APPLICATIONS**

I. NOTICE OF INTENT STATUS (see Instructions)

Mark only one item	A. New Applicator	B. <input checked="" type="checkbox"/> Change of Information: <u>WDID# 241AP00007</u>
	C. <input type="checkbox"/> Change of ownership or responsibility: WDID#	

II. DISCHARGER INFORMATION

A. Name City of San Mateo, Public Works Engineering			
B. Mailing Address 330 West 20 th Avenue			
C. City San Mateo	D. County San Mateo County	E. State CA	F. Zip 94403
G. Contact Person Pete Dalla-Betta	H. E-mail address PDallaBetta@ cityofsanmateo.org	I. Title Lab & Source Control Supervisor	J. Phone 650-522-7388

III. BILLING ADDRESS (Enter Information only if different from Section II above)

A. Name			
B. Mailing Address			
C. City	D. County	E. State	F. Zip
G. E-mail address	H. Title	I. Phone	

IV. RECEIVING WATER INFORMATION

A. Algaecide and aquatic herbicides are used to treat (check all that apply):	
1.	<input checked="" type="checkbox"/> Canals, ditches, or other constructed conveyance facilities owned and controlled by Discharger. Name of the conveyance system: <u>Marina Lagoon</u>
2.	<input type="checkbox"/> Canals, ditches, or other constructed conveyance facilities owned and controlled by an entity other than the Discharger. Owner's name: _____ Name of the conveyance system: _____
3.	Directly to river, lake, creek, stream, bay, ocean, etc. Name of water body: _____
B. Regional Water Quality Control Board(s) where treatment areas are located (REGION 1, 2, 3, 4, 5, 6, 7, 8, or 9): Region <u>2</u> (List all regions where algaecide and aquatic herbicide application is proposed.)	

V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION

A. Target Organisms: algae and widgeongrass
B. Algaecide and Aquatic Herbicide Used: List Name and Active ingredients Cutrine Plus and Ultra (chelated copper) Reward (diquat) Sonar (fluridone) Phycomycin (sodium carbonate peroxyhydrate)
C. Period of Application: Start Date <u>April 1</u> End Date <u>October 1</u>
D. Types of Adjuvants Used: Nonylphenol; D-Limonene

VI. AQUATIC PESTICIDE APPLICATION PLAN

Has an Aquatic Pesticide Application Plan been prepared and is the applicator familiar with its contents? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
If not, when will it be prepared? _____

VII. NOTIFICATION

Have potentially affected public and governmental agencies been notified? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

VIII. FEE

Have you included payment of the filing fee (for first-time enrollees only) with this submittal? <input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> NA

IX. CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. Additionally, I certify that the provisions of the General Permit, including developing and implementing a monitoring program, will be complied with."

A. Printed Name: Pete Dalla-Betta

B. Signature:  Date: 11/16/13

C. Title: **Laboratory and Source Control Supervisor**

XI. FOR STATE WATER BOARD STAFF USE ONLY

WDID:	Date NOI Received:	Date NOI Processed:
Case Handler's Initial:	Fee Amount Received: \$	Check #:
<input type="checkbox"/> Lyris List Notification of Posting of APAP	Date _____	Confirmation Sent _____

Marina Lagoon City of San Mateo

Aquatic Pesticide Application Plan for NPDES General Permit for Discharges of Aquatic Pesticides to Waters of the United States

Submitted to:

State Water Resources Control Board
Attention: Russell Norman
1001 I Street, 15th Floor
Sacramento, CA 95814

Submitted by:

Pete Dalla-Betta, Lab & Source Control Supervisor
City of San Mateo
330 West 20th Avenue
San Mateo, CA 94403

November 5, 2013

PREFACE

The following Aquatic Pesticide Application Plan was prepared by Scott Cressey of Cressey & Associates (510-525-4389) under contract to the Public Works Department of the City of San Mateo. Marina Lagoon is located in San Mateo, California in San Mateo County. The Aquatic Pesticide Application Plan is a requirement of the State Water Resources Control Board for a NPDES General Permit for aquatic pesticide application. This Aquatic Pesticide Application Plan is modeled on the requirements presented in Water Quality Order No. 2013-0002-DWQ for regulations effective December 1, 2013.

Note that the “APAP Review Check List for Order No. 2013-0002-DWQ, Aquatic Weed Control Permit”, is provided on the two pages following the Table of Contents with the APAP page numbers shown for the various permit requirements. This check list, used by the State Water Board reviewers of the submitted APAP, should facilitate review by directing the reviewer to the appropriate page number in the APAP.

MARINA LAGOON AQUATIC PESTICIDE APPLICATION PLAN, 2013

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ATTACHMENTS

ATTACHMENT A – Twenty-Four Hour Report Log Form

ATTACHMENT B – Five-Day Written Report Outline

APAP Review Check List for
Order 2013-0002-DWQ
Aquatic Weed Control Permit

No. ¹	Permit requirements	-√ ³	Found on Page No.
C.1.	Describe the water system where the pesticide ² will be applied.		Page 2-4
C . 2	Describe the treatment area.		Page 4-5
C . 3	Types of weeds to be controlled and why		Page 4
C . 4	- Pesticide products to be used.		Page 5
	- Degradation byproducts of pesticide used if known.		Page 5
	- Method of application.		Page 5
	- Surfactant and adjuvants to be used		Page 5
C . 5	Discuss factors influencing the decision of using pesticide for weed control.		Pages 5-6
C.6	- List of gates or control structures to be used in receiving water.		Page 6
	- Inspection schedule of the gates and control structures.		Page 6
C.7	For those with SIP exception:		N/A
	- exception period (beginning date to ending dates)		N/A
	- justification for exception period		N/A
	- describe plans to ensure compliance if applying pesticide outside the exception period.		N/A
C.8	Describe monitoring program		Pages 8-13
C.9	How to prevent sample contamination.		Pages 13

No.	Permit requirements	A ³	Found on Page No.
	Minimum content of BMPs:		
C.10	a. How to prevent pesticide spill and spill contamination;		Page 20
	b. Ensure only minimum and consistent amount of pesticide used for targeted weeds;		Page 19
	c. Plan for educating applicators on avoiding adverse effect from pesticide application;		Page 19-20
	d. Plan on informing the farmers and agencies who have water rights on the receiving water;		Pages 7
	e. Plan on preventing fish kill from pesticide application;		Page 20
C.11	a. Evaluation alternatives:	i. no action.	Pages 5-6
		ii. Prevention.	Pages 5-6
		iii. Mechanical method.	Pages 17
		iv. Cultural method.	Page 18
		v. Biological control.	Page 17-18
		vi. Pesticide control.	Page 5
	b. Use least intrusive method of weed control;		Pages 5-6, 17-18
c. Apply decision matrix concept for choosing the most appropriate formulation		Page 18, 19, & 23	

Notes:

1. Item in the permit.
2. Pesticides refer to algaecides and aquatic herbicides.
3. Check 4 if APAP contains the required information.

**AQUATIC PESTICIDES APPLICATION PLAN (APAP)
for
MARINA LAGOON
CITY OF SAN MATEO, CALIFORNIA**

**In partial fulfillment of requirements for coverage under the
STATEWIDE GENERAL NPDES PERMIT FOR THE
DISCHARGE OF AQUATIC PESTICIDES FOR AQUATIC WEED CONTROL IN
WATERS OF THE UNITED STATES**

GENERAL PERMIT NO. CAG990005

**City of San Mateo
Department of Public Works
Pete Dalla-Betta, Lab & Source Control Supervisor
330 West 20th Avenue
San Mateo, CA 94403**

November 5, 2013

1.0 INTRODUCTION

In March of this year, the State Water Resources Control Board (State Water Board) adopted the Statewide General National Pollutant Discharge Elimination System (NPDES) Permit (General Permit) for residual aquatic pesticide discharges to Waters of the United States from applications of aquatic pesticides (algaecides and aquatic herbicides) for algae and aquatic weed control. This General Permit covers only those aquatic pesticides that are currently registered with the State of California or that become registered for use in California. To obtain permit coverage, the General Permit requires Dischargers submit to the Water Board an application consisting of a Notice of Intent (NOI) and an Aquatics Pesticide Application Plan (APAP). This application will be posted for 30 days for public review and comment. Within 90 days of the receipt of the permit application, State Water Board's Deputy Director of the Division of Water Quality (Deputy Director) will either issue a Notice of Applicability (NOA) or deny the application. The Discharger is authorized to begin discharging waters treated with aquatic pesticides starting on the date of the NOA. Alternatively, the Deputy Director may issue a Notice of Exclusion (NOE) denying the permit and justifying why the proposed Discharger is not eligible for coverage under this General Permit and stating the reason why.

The APAP describes the methods and procedures that will be used to:

- Determine the need for aquatic pesticide use;
- Evaluate and use alternatives to pesticides when feasible;
- Identify the pesticides proposed for use;

- Describe application methods and application rate determination;
- Assess treatment effectiveness;
- Describe the self-monitoring procedures and annual reporting, and;
- Generally describe how compliance with the permit requirements will be documented.

Should methods and procedures change significantly during the 5-year term of the permit (change in pesticide or quantity), the City will submit these proposed amendments to the APAP to the Deputy Director of the State Water Board for review and approval as required by the General Permit. Following is the City of San Mateo's APAP for Marina Lagoon.

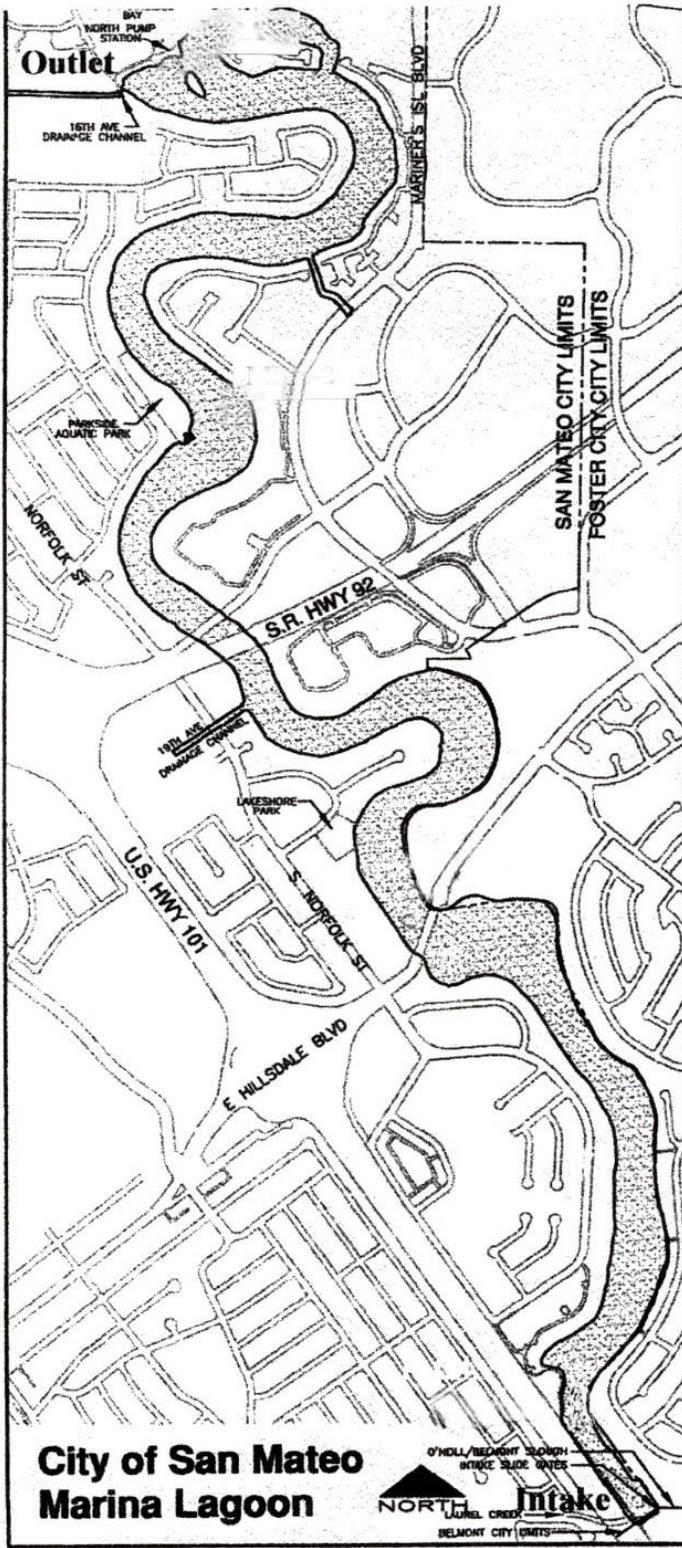
2.0 MARINA LAGOON DESCRIPTION

Marina Lagoon is located entirely within the City of San Mateo, in the County of San Mateo (Figure 1). The lagoon is a remnant of a tidal slough that was impounded and dredged to form an enclosed estuary. The lagoon serves as a flood control basin, recreation area, aesthetic amenity, and ecological resource and is managed to optimize these benefits. The lagoon is bordered by more than 300 residential parcels, the majority with private docks; two public beaches, a boat launch, and bike path. The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) developed by the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) lists the beneficial uses of Marina Lagoon as: Estuarine Habitat; Wildlife Habitat; Water Contact Recreation; and Non-contact Water Recreation.

The lagoon meanders in a northerly direction for approximately 4 miles from its San Francisco Bay inlet via O'Neill Slough to its outlet into Seal Slough. The lagoon ranges from 300-400 feet in width, with a depth of up to 8 feet at mid-channel and a typical depth between 4-5 feet. Much of the lagoon is designed with side slopes of 5:1 for bank stability. The lagoon covers approximately 177 acres with a capacity of approximately 1000 acre-feet at normal summer operating level. The lagoon's primary water source is tidal flow from O'Neill Slough, at a rate of approximately 52 million gallons per day, annualized. Perennial low volume flows of fresh water from a 10.3 square mile watershed drain into the Lagoon. Fresh water flows comprise only about 0.3 percent of total annual inflow.

Flow enters the lagoon passively through the South Structure tide gates and is discharged through the North Pump Station. The lagoon's maximum design operating range is below mean sea level. An elevation drop from O'Neill Slough into the lagoon does not permit reverse flow from the lagoon into O'Neill Slough. At the North Pump Station, flap gates prohibit flow from San Francisco Bay entering the lagoon. As a result, the volume entering the lagoon can only flow toward the North Pump Station and cannot be discharged without the pumps on.

Bay-like conditions within the lagoon are encouraged by maximizing the tidal water exchange rate. This is accomplished by setting the discharge pumping rate to match the inflow. In doing so, the potential for development of thermal gradients, stagnant conditions, lengthy periods of low salinity, and aquatic insect infestations are minimized. Routine pump operation results in an average water exchange of about 6 days. On occasion this scheme is altered to reserve floodwater storage capacity by closing the inlet gates, but the gates are returned to open position as soon as it is prudent, depending upon stormwater inflows and tidal conditions.



AT A GLANCE

Dry season level	96.7 ft*
Wet season level	95.0 ft*
(Approx. mean sea level	97.5 ft*)
*San Mateo Datum	
Surface Acres	180 ac
Length	4 mi
Width	300-400 ft
Acre-feet (summer)	1000 ac ft
Max depth (summer)	7 ft
Inflow (avg)	52 mgd
Water exchange (avg)	6 days



Figure 1

Marina Lagoon Location Map

The lagoon water level is regulated on a seasonal basis to optimize flood control, recreation, aesthetics, and ecological benefits. In the late fall of each year, the water level is lowered to create a receiving basin for stormwater runoff as protection from lowland flooding. During the summer, the water level is maintained to provide optimal conditions for swimming, boating, and other recreational uses. The water level is controlled using the O'Neill Slough intake gates and the north end discharge pumps. The pumping plant's maximum pumping capability of 600,000 gallons per minute, in combination with the winter design level of elevation is capable of handling a 100-year storm event.

3.0 WEEDS AND ALGAE SUBJECT TO CONTROL

Nuisance species are widgeongrass (*ruppia maritima*) and filamentous algae (*cladophora*). Left unchecked, these species proliferate to the point of interfering with motor boating and swimming, and pose odor and visual impacts to recreational users and adjacent residents.

4.0 TREATMENT AREA DESCRIPTION

Most of the area of Marina Lagoon needing occasional to regular treatment is along the shoreline where mechanical harvesting of aquatic weeds can't occur because of shallow water depth and piers sticking out into the lagoon. Small embayments and shallow channels entering the lagoon also tend to be prime areas for treatment with aquatic pesticides. More limited water circulation in these locations favors algae and aquatic weeds, and being relatively small, it is difficult or impossible to operate a mechanical harvester in these locations. The south end of the lagoon where inflow occurs is only 1-2 feet deep and is too shallow for the mechanical harvester to operate, so must be treated with aquatic pesticides.

The NPDES Permit defines the "application area" as the area to which aquatic pesticides are applied, and defines "treatment area" as the area (including drift from the application area) that is treated (affected) by aquatic pesticide to control the target pest. Treatment of nuisance growth in Marina Lagoon is not intended to be accomplished by employing "drift" within the water body; rather, applications are made at the point that control is desired. Therefore, the application area and treatment area is the same. "Application area" is the term used in this document. An application area may be located anywhere within the lagoon where an action level has been reached. These are typically specific isolated locations and not the entire lagoon.

Historically, widgeongrass ranges mostly north of the SR 92 bridge, but isolated patches also occur from the SR 92 bridge south to the Hillsdale Bridge. Algae problems are most common along the entire perimeter of the lagoon, but are more problematic south of the SR 92 Bridge. This is in part because the south end is more shallow but also more turbid, which discourages widgeongrass growth. The north end is slightly deeper and less turbid than the south end and thus more conducive to widgeongrass growth. A healthy population of widgeongrass also tends to displace algae to some extent as it consumes the available nutrients.

The NPDES Permit defines "application event" as the time that introduction of the aquatic pesticide to the application area takes place; that is, the time that the product is applied, not the length of time that it releases to the environment. The surface area of the lagoon is large enough

that action levels may vary throughout the lagoon at a given time, and a given nuisance condition may call for a particular aquatic pesticide. Therefore, there may be more than one application area and more than one application event on a given day.

For the purpose of establishing the total number of application events, “application event” is further defined as a contiguous area of treatment using the same pesticide or pesticide combination. Use of a different pesticide or pesticide combination immediately adjacent to an application area is a separate application event.

5.0 AQUATIC PESTICIDES USED AND APPLICATION METHODS

The following Table 1 describes the aquatic pesticides likely to be used to control algae and widgeongrass in Marina Lagoon and their application methods.

Table 1. Aquatic Pesticides Expected to be Used on Marina Lagoon

Pesticide	Active Ingredient	Degradation By-Product	Adjuvant or Surfactant	Application Method
Citrine Plus	Chelated copper	None	None	Subsurface injection into water column or surface sprayed
Citrine Ultra	Chelated copper	None	D-Limonene	Subsurface injection into water column or surface sprayed
Reward	Diquat dibromide	None	None	Subsurface injection into water column
Sonar	Fluridone	None	None	Subsurface injection into water column
Phycomycin	Sodium Carbonate Peroxyhydrate	Water & dis. oxygen	None	Subsurface injection into water column

6.0 DECISION FACTORS FOR USING AQUATIC PESTICIDES

Nuisance conditions are established by the sensibilities of the community. Primary impacts resulting from nuisance growth include impairment of recreational uses (e.g. motor boating and swimming), visual aesthetics and odors.

Nuisance conditions are defined as an accumulation of algae on the water surface, and/or widgeongrass at a height in the water column that interferes with motorcraft or swimming. Growth at these levels also has potential to fragment and wash ashore to form aesthetic and odor nuisances.

Action levels are established to ensure that community values are protected while containing costs and minimizing pesticide use. The action level, or threshold, is the point in the nuisance plant growth cycle where a control action should be taken in order to head off a probable nuisance condition. An appropriate threshold ensures that aquatic pesticides will not be used prior to there being evidence of an impending nuisance condition, but at the same time ensuring

that action is taken early enough so that projected growth does not result in routine development of a nuisance condition.

Influential Factors

The factors influencing the decision to use aquatic pesticides are based on the experience of many years of management such that seasonal nuisance growth is predictable, and a recognition that nuisance conditions negatively impact the recreational and aesthetic amenities of the lagoon. Left unchecked, widgeongrass and algae each have the propensity to proliferate to a level that can result in entanglement of motorcraft and swimmers in the growth, as well as result in visual and odor nuisances. A characteristic of each nuisance species is a high growth rate that occurs each mid-to late spring. This rate of growth has the ability to render control efforts ineffective if not initiated at the proper time in anticipation of the growth acceleration.

Years of experience also conclude that effective nuisance control is not attainable by the use of non-chemical methods alone. Control methods are initiated in a sequence that utilizes aquatic pesticides as the initial control action to inhibit growth rates and to spot treat problem areas, followed by mechanical harvesting for control of aquatic plant growth within tolerances and cleanup of biomass. Harvesting also removes the biomass from the lagoon, thereby helping to reduce a nutrient source. This integrated approach to nuisance management helps minimize potential adverse environmental impacts from pesticide use.

7.0 GATES, CONTROL STRUCTURES, AND INSPECTION SCHEDULE

Lagoon gates and control structures are not manipulated in connection with aquatic pesticide applications in most of the lagoon as there are no holding requirements in connection with the contact aquatic pesticides used. In addition, the entire lagoon is never treated during any single application event. Marina Lagoon is 4 miles in length and it takes 6 days for water entering the south end to exit the lagoon at its north end. As such there is no need to shut the outflow pumps when most of the lagoon is treated with aquatic pesticides.

The exception to this is when contact pesticides are applied to the northern end of the Marina Lagoon near the outlet, it is important to keep the outflow pumps inactive for several days. This is because the treated waters, being relatively near the outlet pumps, may be pumped into San Francisco Bay prior to the Post-Application water quality monitoring. For this reason, any application of aquatic pesticides, particularly copper-based algaecides, in Zone A of the lagoon (the northernmost zone), should have the outflow pumps shut down prior to the pesticide application and continue to remain shut down until the Post-Application monitoring is completed 4 -7 days after the application event. This will allow the targeted plant or algae time to come into full contact with the pesticide and to minimize pesticide residue being discharged to San Francisco Bay. Should laboratory analysis results of the Post-Application sampling show concentrations of the active ingredient of the pesticide occurring at levels in excess of both the background level and the criterion level, then future applications of this pesticide in Zone A will require a longer period of keeping the outflow pumps shut down (an additional day or two).

Note that applications of the systemic pesticide, Sonar Genesis, in Marina Lagoon are limited to the southern half of the lagoon south of Hwy 92. Inflow waters to Marina Lagoon enter the southern end of the lagoon through a tidal gate from Belmont/O'Neill Slough. Discharge of lagoon waters to San Francisco Bay occur at the north end of the lagoon 64 miles away from the inflow gates. By restricting the application of Sonar Genesis to the southern half of Marina Lagoon, there should be no discharge of fluridone to San Francisco Bay even without altering the lagoon's outflow pump normal operation.

8.0 CATEGORICAL EXCEPTION

The City has not applied for a Categorical Exception per Section 5.3 of the *Policy for Implementation of Toxic Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*.

9.0 PUBLIC NOTIFICATION OF AQUATIC PESTICIDE APPLICATION

The General Permit requires that every calendar year, at least 15 days prior to the first application of algaecide or aquatic herbicides, dischargers notify potentially affected public agencies. However, there are no public agencies or farmers that are potentially affected by Marina Lagoon's pesticide applications, so no notice is needed at this time.

The City has and will continue to notify City residents of aquatic pesticide applications at the start of the application season via email. The email notification will provide the Public Works phone number where interested residents could obtain information on application locations for a particular day. The City will also continue posting signs at public beaches prior to and immediately nearby applications. As the decision to apply aquatic pesticides to a specific area of the lagoon is decided 1 to 3 days prior to the actual application, the City is restricted to posting public beaches 24-48 hours prior to the application. The email notifications and beach postings include the following information:

- A statement of the City's intent to apply algaecide or aquatic herbicide(s);
- Name of algaecide and aquatic herbicide(s);
- Purpose of use;
- General time period and locations of expected use;
- Any water use restrictions or precautions during treatment; and
- A phone number that interested persons may call to obtain additional information.

The City will provide a phone number or other specific contact information to all persons who request the City's application schedule. The City will provide the requester with the most current application schedule and inform the requester if the schedule is subject to change.

10.0 AQUATIC PESTICIDE APPLICATION LOG

The City, or the City's contractor, will maintain a log for each application of aquatic pesticide in Marina Lagoon. The application log contains the following information:

- Date of application;
- Location of application;
- Name of applicator;
- Type and amount of each pesticide used;
- Application details, such as the water level of Marina Lagoon, time the application started and stopped, pesticide application rate and concentration;
- Visual monitoring assessment; and
- Certification that applicator followed the APAP.

11.0 MONITORING AND REPORTING PROGRAM

The City’s Monitoring and Reporting Program (MRP) is structured to meet the requirements described in Attachment C of the General Permit. As such, the MRP is designed to answer two key questions.

Question No. 1: Does the residual algaecides and aquatic herbicides discharge cause an exceedance of receiving water limitations?

Question No. 2: Does the discharge of residual algaecides and aquatic herbicides, including active ingredients, and degradation products, in any combination cause or contribute to an exceedance of the “no toxics in toxic amount” narrative toxicity objective?

For a monitoring program to satisfactorily answer the above two questions, its sampling locations must be representative of the discharge characteristics for all treatment areas, and its sampling schedule must encompass the time periods of interest appropriate to each active ingredient in the environment to which it has been applied. Factors that can determine the answers to the questions stated above include:

- Application practices (application method and ensuring that the manufacturer’s recommended application rate of the pesticide is not exceeded);
- Transport, fate, and effects understanding for each pesticides active ingredient (copper ultimately binds to the sediment and is no longer bioavailable; sodium carbonate peroxide breaks down into sodium carbonate and hydrogen peroxide which oxidizes the target pest and then breaks down into water and oxygen; fluridone photo degrades and has a half-life of 20 days in water and is rapidly adsorbed to sediment particles).

Potential Impacts. Potential adverse impacts of an aquatic pesticide are both direct and indirect. Exceedance of an active ingredient’s chronic or acute criterion for receiving water limitations is assumed to cause stress, illness, or death to sensitive aquatic biota. Copper added to a water body will cause a temporary reduction in dissolved oxygen levels in the treatment area. Treating too large a portion of a water body at one time may result in the decomposition of large amounts of aquatic plant biomass sufficient to severely lower dissolved oxygen levels and cause a fish kill. The premature use of fluridone-treated fresh water for irrigation can stress or kill sensitive crops or landscaping.

To answer Question No. 1, the following receiving water limitations, expressed as instantaneous maximum concentrations, for the active ingredients of the aquatic pesticides planned for use in Marina Lagoon are shown in Table 2 below.

Table 2. Criteria for Pesticides used in Marina Lagoon

Active Ingredient	Instantaneous Maximum Concentration¹
Copper (dissolved)	Saltwater (salinity \geq 10 ppt 95% of time) 3.1 ug/L ²
Diquat	20 ug/L
Fluridone	560 ug/L

¹ From the *General NPDES Permit Order No. 2013-0002-DWQ* Section VI.A Table 3.

² As stated in the California Toxic Rule (40 CFR 131.38) and per conversation with Jenny Chen of the State Water Board on August 22, 2013 .

Should the Post-Application monitoring result for the active ingredient in the aquatic pesticide be found at a concentration higher than the standard shown in Table 1, then the State Water Board and Regional Water Board will be notified by phone within 24 hours. A written report to these agencies must follow within 5 days of being aware of the “non-compliance” (criterion exceeded). On occasions when the Pre-Application monitoring sample finds dissolved copper in excess of the 3.1 ug/L criterion the Post-Application sample (taken within 7 days of the application) can be compared to the background (Pre-Application) sample results to determine compliance or non-compliance. More details on reporting requirements are provided in Section 11.2

The determination of an answer to Question No. 2 is based partly on the results of the general water quality parameters measured at the sampling locations at the time of the aquatic pesticide residue monitoring, plus visual observation of the surrounding aquatic conditions. The Basin Plan states that receiving waters should contain a minimum of 5 mg/L dissolved oxygen. As such, any reading less than the 5 mg/L Basin Plan objective is considered to be non-compliant with the General Permit and must be reported to regulatory agencies as described above. However, should the dissolved oxygen for the Post-Application reading be greater than the dissolved oxygen level for the Pre-Application (background) sample, then it is in compliance even though it may be less than the 5 mg/L Basin Plan objective. Otherwise this evaluation largely depends on a subjective assessment of the following (include summarized notes on water conditions in the monitoring report):

- Floating or suspended matter;
- Discoloration;
- Bottom deposits;
- Aquatic life;
- Visible films, sheens, or coatings;
- Fungi, slimes, or objectionable growths; and
- Potential nuisance conditions.

An understanding of the aquatic biota and ecosystem of an area are essential in subjectively assessing if the environmental conditions described above violate the narrative descriptions of the Basin Plan by harming aquatic biota. Furthermore, this evaluation must take into consideration the following considerations:

- The basic geographic and hydrographic features of the area, particularly application points and the logical pathway(s) of residue flow;
- Algaecides and aquatic herbicide application practices and how they are distributed in time and space;
- Relevant knowledge about the transport, fates, and effects of aquatic pesticides, including best- and worst-case scenarios;
- The designated beneficial uses of the water body;
- Relevant knowledge of the action of cumulative and indirect effects;
- Mechanisms through which aquatic pesticide applications could lead to designated use impacts, given the basic features of the area;
- Known and potential impacts of aquatic pesticide applications on water quality, ranked in terms of relative risk based on factors such as magnitude, frequency and duration;
- Sufficient numbers of sampling areas to assess the entire area of influence; and
- An understanding of the sampling methods and sampling schedule.

11.1 MONITORING PROGRAM REQUIREMENTS

Monitoring requirements in regard to constituents/parameters monitoring and sampling depths are provided in Attachment C of the General Permit and reproduced below as Table 3. There are two items from the notes of Table 3 to which particular attention should be paid, plus one note of caution in regard to copper sampling. Be aware of the following:

- Samples shall be collected at 3 feet below the surface of the water or at mid-water column depth if the water depth is less than 3 feet.
- The minimum number of aquatic pesticide application monitoring is six events, unless the total number of pesticide application events are less than six, in which case all application events must be monitoring (more details on this are provided under “Sampling Frequency”).
- Because the applicable copper criterion (see Table 2) is expressed as “dissolved copper”, the analysis of the water sample must be for dissolved copper, not total copper. As such, the water sample should be filter through a 0.45 micron filter within 15 minutes of

collection. Therefore the water sample must be filtered in the field at the time of collection. This is best accomplished with a peristaltic pump with a disposable 0.45 micron filter on the end of the sampling tube incorporated into the sampling procedure.

Table 3. Monitoring Requirements

Sample Type	Constituent/Parameter	Units	Sample Method	Minimum Sampling Frequency	Sample Type Requirement	Required Analytical Test Method
Visual	1. Monitoring area description (pond, lake, open waterway, channel, etc.) 2. Appearance of waterway (sheen, color, clarity, etc.) 3. Weather conditions (fog, rain, wind, etc.)	Not applicable	Visual Observation	1	Background, Event and Post-event Monitoring	Not applicable
Physical	1. Temperature ²	°F	Grab ⁴	5	Background, Event and Post-event Monitoring	6
	2. pH ³	Number				
	3. Turbidity ³	NTU				
	4. Electric Conductivity ³ @ 25°C	umhos/cm				
Chemical	1. Active Ingredient ⁷	ug/L	Grab ⁴	5	Background, Event and Post-event Monitoring	6
	2. Nonylphenol ⁸	ug/L				
	3. Hardness (if copper is monitored; freshwater only)	mg/L				
	4. Dissolved Oxygen ²	mg/L				
¹ All applications at all sites. ² Field testing. ³ Field or laboratory testing. ⁴ Samples shall be collected at three feet below the surface of the water body or at mid water column depth if the depth is less than three feet. ⁵ Collect samples from a minimum of six application events for each active ingredient in each environmental setting (flowing water and non-flowing water) per year, except for glyphosate. If there are less than six application events in a year, collect samples during each application event for each active ingredient in each environmental setting (flowing water and non-flowing water). If the results from six consecutive sampling events show concentrations that are less than the receiving water limitation/trigger for an active ingredient in an environmental setting, sampling shall be reduced to one application event per year for that active ingredient in that environmental setting. If the yearly sampling event shows exceedance of the receiving water limitation/trigger for an active ingredient in an environmental setting, then sampling shall return to six application events for that active ingredient in each environmental setting. For glyphosate, collect samples from one application event from each environmental setting (flowing water and non-flowing water) per year. ⁶ Pollutants shall be analyzed using the analytical methods described in 40 C.F.R. part 136. ⁷ 2,4-D, acrolein, dissolved copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, and triclopyr. ⁸ It is required only when a surfactant is used.						

Monitoring Frequency. The number of aquatic pesticide application events required to be monitored each year is six events for each pesticide. If the total number of aquatic pesticide application events is less than six events for the year, then all of these events must be monitored. Should six consecutive monitoring show that the active ingredient of concern is within the stated criterion concentration (see Table 2), then monitoring for that particular pesticide can be

reduced to one application event per year for the remaining years of the permit. However, if a following year's monitoring shows that the criterion is exceeded, then the City must resume with monitoring six application events per year. Note that this requirement is for six consecutive "monitoring" events annually, not six consecutive "application" events annually.

Monitoring Locations and Number of Samples per Monitoring Event. Each monitored application event results in the collection of three water samples for laboratory analysis for the pesticide's active ingredient. This occurs over two visits to the sampling site within 7 days of the application event. The three collected samples are as follows:

Pre-Application (background) Sample – This sample is taken within the treatment area up to 24 hours in advance of the pesticide application event.

Event Sample – In Marina Lagoon, this consists of locating oneself 50-70 feet outside of the treatment boundary, waiting 5 minutes after the pesticide application has occurred along this boundary, and collecting the "Event" sample at this location outside the treatment area.

Post-Application Sample – Within 7 days of the pesticide application event, return to the same area within the treatment area and collect one post-event water sample for laboratory analysis.

Recording of Field Data. During the collection of each water sample for pesticide residue analysis, field measurements of general water quality constituents are recorded on the field form along with visual observations of water quality conditions. Listed in Table 3, these field measurements are for: air and water temperature; dissolved oxygen; pH; salinity; and turbidity.

In addition to recording all field measurements and observations on the field sheet, the following information shall also be on the field sheet:

- The date, exact place (GPS coord., plus narrative description), and time of the sampling or measurements;
- The individual(s) who performed the sampling or measurements;
- Date of the application event being monitored (on the Post-Event sample sheet).

Field Instrument Calibration. All field instruments used to monitor water quality shall be properly maintained and calibrated as necessary to ensure their accuracy. The dissolved oxygen meter and the turbidity meter should be calibrated each morning just prior to the first sampling. The pH meter should be calibrated weekly. A refractometer type of salinity meter is relatively stable, but placing distilled water on a well rinsed lens and checking for a 0 salinity reading serves as a calibration check. Be sure and rinse the lens off with distilled water three times after its use, and dry the lens before putting it away.

It is important to note that calibration fluids for the turbidimeter and pH meter should be replaced annually or at least every 2 years. The membrane fluid for the dissolved oxygen meter should also be replaced every 2 years.

The City and its contractor(s) institute a Quality Assurance–Quality Control Program for any onsite field measurements such as salinity, pH, turbidity, temperature, and dissolved oxygen. A manual containing the steps followed in this program is kept in the City offices and is available for inspection by the State Water Board and the appropriate Regional Water Board staff. The Quality Assurance–Quality Control Program must conform to U.S. EPA guidelines or to procedures approved by the State Water Board and the appropriate Regional Water Board.

Sampling Procedures and Contamination Avoidance. Measurements of dissolved oxygen, temperature, pH, turbidity, and salinity are conducted in the field. These parameters, and water samples for laboratory testing, shall be taken from 3 feet below the surface of the water. If the water depth is less than 3 feet, then the sample is taken from the mid-depth of the water column.

If sample collection is achieved using a discrete–depth sampling bottle such as a Kemmerer bottle. The Kemmerer bottle or equivalent shall be rinsed three times in the water to be sampled prior to collecting the water samples from that site.

Samples for dissolved copper testing shall be collected using a length of silicone tubing sufficient to reach 3 feet deep in the water column, a peristaltic pump, and a 0.45 micron disposable filter the end feeding into a plastic sampling bottle. The sampling bottles for dissolved copper should contain an acid preservative provided by the analytical laboratory. Should a peristaltic pump and filter be unavailable, the sample should not be acidified but merely put on ice in a cooler for delivery to the analytical laboratory.

All samples shall be stored in a cooler with ice packs until delivery to a certified laboratory for analyses. All sample containers shall be labeled before storing them in the cooler.

Sampling will be conducted using sampling procedures which minimize loss of monitored constituents during sample collection and analysis and maintain sample integrity. To minimize the risk of contamination during sampling, the following protocols are followed:

- Water sample collection will not be conducted out of the “treatment” boat (residue risk);
- Latex gloves will be worn during sampling;
- Sample container labels will be filled out with permanent ink prior to attachment to the container;
- Sample labels will include: location, date, and time of sample collection.
- The discrete-depth sampling device will be rinsed three times with water from the sampling site before retaining the sample;
- Silicon tubing and the 0.45 micron disposable filter for the peristaltic pump will be used for one application event for that day only, then replaced or thoroughly decontaminated before future use;
- Samples will be kept out of the sun and stored in a cooler with ice packs;
- CalTest Laboratory’s chain-of-custody form will be used at all stages of sample transfer;
- Following the day’s sampling event, the Kemmerer bottle (or equivalent) will be washed inside and out with an Alconox solution (a detergent used to wash lab glassware), rinsed twice, then given a final rinse with distilled water. During this process, the spigots on the instrument will be open and both soapy water and rinse water passed through the spigots.

Laboratory Analysis for Pesticide Residue. All laboratory analyses shall be conducted at a laboratory certified for such analyses by the California Department of Public Health in accordance with California Water Code section 13176. Laboratories that perform sample analyses shall be identified in all monitoring reports.

All laboratory analyses for the pesticide’s active ingredient shall be conducted in accordance with the latest edition of “Guideline Establishing Test Procedures for Analysis of Pollutants” promulgated by the U.S. EPA in title 40 Code Federal Regulation (40 C.F.R.) 136 or equivalent methods that are commercially and reasonably available and that provide quantification of sampling parameters and constituents sufficient to evaluate compliance with applicable effluent limits and to perform reasonable potential analysis. Equivalent methods must be more sensitive than those specified in 40 C.F.R.136 and must be approved for use by the Regional Water Board Executive Officer.

11.2 REPORTING PROGRAM REQUIREMENTS

There are three types of reporting to the State Water Board: 1) Annual Reporting (due March 1 describing the results of the previous year’s monitoring); 2) 24 hour Reporting (provided orally); and 3) Five Day Reporting (a written report following up the oral report). There is also a fourth type of reporting that involves reporting an adverse incident to a threatened or endangered species to the National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service. The requirements and purpose of each of these types of reports are explained in the following sections.

Annual Report. The City will submit to the Deputy Director and the Regional Water Board Executive Officer an annual report consisting of a summary of the past year's activities, and certify compliance with all requirements of the General Permit. If there is no discharge of algaecides and aquatic herbicides, their residues, or their degradation byproducts, the City will provide a certification that algaecide and aquatic herbicide application activities did not result in a discharge to any water body. The annual report shall contain the following information:

- An executive summary discussing compliance or violation of the General Permit and the effectiveness of the APAP; and
- A summary of monitoring data, including the identification of water quality improvements or degradation as a result of the algaecide or aquatic pesticide application.

The annual report will be submitted according to the following schedule in Table 4:

Table 4. Annual Reporting Schedule

Reporting Frequency	Reporting Period	Annual Report Due
Annual	January 1 through December 31	March 1

Annual Report Protocols. The City shall adhere to the following protocols when preparing an Annual Report.

- Each sample result will include the applicable reported Minimum Level (ML) and the current Minimum Detection Limit, as determined by the procedure in 40 C.F.R. part 136.
- The results of analytical determinations for the presence of the pesticide's active ingredient will use reporting protocols listed on page C-9 of Order No. 2013-0002-DWQ. These protocols describe the reporting procedures to follow regarding Method Detection Limits and Reporting Limits.
- All reported data will be arranged in a tabular format. The data will be summarized to clearly illustrate whether the algaecide and aquatic herbicide applications are conducted in compliance with effluent and receiving water limitations.
- The City will attach a cover letter to the annual report that clearly identifies violations of the permit; discusses corrective actions taken or planned; and provides a time schedule for corrective actions. Identified violations will include a description of the requirement that was violated and a description of the violation.
- The annual report will be submitted to the State Water Board and the San Francisco Bay (Region 2) Regional Water Board, signed and certified as required by the Standard Provisions (Attachment B, Standard Provision, of the Order No. 2013-0002-DWQ).

Electronic Submittal of the Annual Report. Note that at any time during the term of the General Permit, the California State Water Board or the Regional Water Board may notify dischargers of the requirement to submit electronically Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program (<http://www.waterboards.ca.gov/ciwqs/index.html>). Until such notification is given, the City will submit hardcopy SMRs. The CIWQS website will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

Dischargers would not be required to duplicate the submittal of data that are entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, dischargers shall submit electronically the data in a tabular format as an attachment.

Dischargers will report the results for all monitoring specified in the General Permit MRP in the SMR. Dischargers will submit annual SMRs including the results of all required monitoring using U.S. EPA-approved test methods or other test methods specified in the General Permit. If dischargers monitor any pollutant more frequently than required by the General Permit, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

Twenty-Four Hour Report. The City will report to the State Water Board (Russell Norman, 916-323-5598) and the Regional Water Board (Farhad Azimzadeh, 510-622-2310) any noncompliance, including any unexpected or unintended effect of an algaecide or aquatic herbicide use that may endanger health or the environment. Information will be provided orally within 24 hours from the time the City becomes aware of the circumstances and will include the following information:

- The caller's name and telephone number;
- Applicator name and mailing address;
- Waste Discharge Identification (WDID) number (WDID#241AP00007);
- The name and telephone number of a contact person;
- How and when the City become aware of the noncompliance;
- Description of the location of the noncompliance;
- Description of the noncompliance identified and the U.S. EPA pesticide registration number for each product applied in the area of the noncompliance; and
- Description of any steps that the City has taken or will take to correct, repair, remedy, cleanup, or otherwise address any adverse effects.

A log form for a Twenty-Four Hour Report is provided in this document as Attachment A. In the event that the City or its contractor(s) are unable to notify the State and Regional Water Boards within 24 hours, the City will do so as soon as possible and also provide the rationale for why it was unable to provide such notification within 24 hours.

Five-Day Written Report. The City will provide a written submission within five (5) days of the time it becomes aware of the noncompliance. The written submission shall contain the following information:

- Date and time the City contacted the State Water Board and the Regional Water Board notifying of the noncompliance and any instructions received from the State and/or Regional Water Board; information required to be provided in Section D.1 (24-Hour Reporting);
- A description of the noncompliance and its cause, including exact date and time and species affected, estimated number of individual and approximate size of dead or distressed organisms (other than the pests to be eliminated);
- Location of incident, including the names of any waters affected and appearance of those waters (sheen, color, clarity, etc.);
- Magnitude and scope of the affected area (e.g. aquatic square area or total stream distance affected);
- Algaecide and aquatic herbicide application rate, intended use site (e.g., banks, above, or direct to water), method of application, and name of algaecide and herbicide product, description of algaecide and herbicide ingredients, and U.S. EPA registration number;
- Description of the habitat and the circumstances under which the noncompliance activity occurred (including any available ambient water data for aquatic algaecides and aquatic herbicides applied);
- Laboratory tests performed, if any, and timing of tests. Provide a summary of the test results within five days after they become available;

- If applicable, explain why the Coalition or Discharger believes the noncompliance could not have been caused by exposure to the algaecides or aquatic herbicides from the Coalition's or Discharger's application; and
- Actions to be taken to prevent recurrence of adverse incidents.

The State Water Board staff or Regional Water Board staff may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. A Five-Day Written Report Outline (with mailing addresses) is provided in this document as Attachment B.

Adverse Incident Notification. During aquatic pesticide operation, if an adverse incident should occur to a federally designated threatened or endangered anadromous or marine species or their critical habitat, the NMFS in Santa Rosa should be contacted by phone (707-575-6050) within 24 hours. Should the adverse incident occur to a threatened or endangered terrestrial or freshwater species, the FWS (916-414-6600) should be verbally contacted within 24 hours.

12.0 EVALUATION OF OTHER MEANS OF AQUATIC WEED CONTROL

Mechanical Harvesting. One or more mechanical harvesters are used by the City on Marina Lagoon throughout the late spring and summer. They work best on widgeongrass as filamentous algae is not sufficiently firm for mechanical harvesting; however, filamentous algae often is harvested incidentally with the widgeongrass or the harvesters are used to skim the water surface and collect floating filamentous algae. The harvesters work best in the open waters of the lagoon, as near shore areas are often too shallow or have frequent docks or other obstructions for a harvester to function properly. The majority of the aquatic weeds in Marina Lagoon are mechanically harvested and disposed offsite.

Rotovation. Mechanical rotovation holds promise as a measure to discourage widgeongrass infestation. Rotovators use underwater rototiller-like blades that churn up to a foot into the bottom of the water body to disrupt a seed bed and young rooting plants. Rotovation would be deployed in the early spring when the season's growth is only beginning to emerge. As no biomass exists at this stage of growth, there is no biomass generated and no resulting biomass removal needs. Depending on plant density and sediment type, two to three acres per day can be rotovated. The lagoon is of suitable size for rotovation to be economically and logistically feasible. The City is reserving judgment on use of this control technology until additional review is completed.

Aquatic Dyes. Aquatic dye has potential to discourage widgeongrass and algae growth in deeper water (mid-channel). Use of aquatic dye would probably require a change in lagoon hydraulic operations, which presently promotes water exchange. Probably the only cost-effective method of dye use would be to close the South Structure tide gates, shut off the North pumps and hold the water for the duration of the dye application season. The hold time would probably need to be a least two months (May-June). Dye application could also conflict with the City's efforts to educate residents about the importance of understanding the lagoon as a natural water body, rather as a water feature. Some community members may desire that the dye be used year-round for aesthetic reasons. Aquatic dyes are deemed not desirable at this time

Beneficial Bacteria. Beneficial bacteria may have potential to reduce bioavailability of nutrients in the lagoon's substrate. Beneficial bacteria consume the same nutrients that are available to nuisance plants. In effect, beneficial bacteria deprives aquatic nuisance growth of a ready food source, thereby inhibiting growth. However, like dyes, use of beneficial bacteria would probably require that the lagoon remain static for the application season. Additionally, applications of beneficial bacteria work best in relatively small pockets with high organic material content, not on a large water body. Therefore, this option is not being considered at this time.

Biological Control. Aquatic beetles that consume aquatic plants have been used in freshwater impoundments for aquatic weed control with mixed success. Marina Lagoon is brackish to saltwater, not fresh, and would not support aquatic beetles.

Cultural Control. Homeowners boarding on Marina Lagoon have received and continue to receive information on the do's and do not's of landscape and lawn fertilizing, overwatering, and proper grass clipping disposal. This information is on the website for Marina Lagoon homeowners, and periodically in the past educational flyers have been distributed to homeowners. Education of homeowners regarding measures to prevent nutrients and pesticides from entering Marina Lagoon from rainfall and irrigation runoff is a continuous process.

13.0 BEST MANAGEMENT PRACTICES

The following best management practices (BMPs) will be implemented to minimize the amount of aquatic pesticides used in an area, to minimize the extent and duration of impacts caused by the discharge of aquatic pesticides to Marina Lagoon, and to allow for restoration of water quality and protection of beneficial uses of the lagoon waters to pre-application quality following completion of a treatment event.

- Licenses and Permits.
 - The City will obtain all necessary regulatory permits prior to application of aquatic pesticides.
 - Aquatic pesticide applications by the City and its contractors will be conducted in conformance with licensing and other requirements of the Cal-EPA Department of Pesticide Regulation.
- Inspection and Assessment. The City or its contractors will conduct visual observations of the entire lagoon at a frequency deemed prudent to identify emerging nuisance conditions, need for treatment, and type of treatment (see the following Decision Matrix, Figure 2). The following actions will be employed:
 - Initiate inspections in March; conduct weekly, April through July, or as the nuisance growth season dictates.
 - Observe for indicators of nuisance growth, such as accumulation of bottom or floating algae, and spot "raking" for evidence of weed growth if not otherwise visible.
 - Utilize predetermined "action levels" to qualify treatment decision making.
 - Measure and record ambient environmental conditions and physical water quality characteristics that may provide clues to impending nuisance conditions.

- Record the inspection event on daily work report.
 - Schedule subsequent inspection and/or application event, as applicable.
- Action Levels. The City has established action levels for nuisance control that protects community values while ensuring that use of aquatic pesticides is minimized. An appropriate threshold ensures that herbicides will not be used prior to visual evidence of growth, while at the same time ensuring that projected growth rates do not result in routine exceedance of the threshold. Action levels are defined as follows:
 - *Algae:* Dots of floating algae begin to accumulate on the surface, or the alga is at a life stage when, in the opinion of the qualified applicator (a holder of a Department of Pesticide Regulation Qualified Applicator License), a detachment is probably imminent.
 - *Widgeongrass:* Rake samples of bottom growth indicate a grass length of 6 to 12 inches and a life stage when, in the opinion of the qualified applicator (a holder of a Department of Pesticide Regulation Qualified Applicator License), the typical acceleration in growth rate is probably imminent.
 - Integrated Control Strategy. Once action levels have been reached, the City will implement the following sequence of chemical and mechanical controls action:
 - *Algae.* Initiate applications for algae control. If and when rate of algal accumulations on water surface result in formation of substantial biomass, augment chemical applications with mechanical skimming using harvesters.
 - *Widgeongrass.* Initiate applications for widgeongrass to suppress potential rate of growth. Roughly concurrent with the initial chemical application, put on-site harvester on standby. Begin harvesting when height of widgeongrass allows for efficient cutting and biomass removal (approximately 2-3 feet in length).
 - Pesticide Application Protocols.
 - Always apply product in accordance with its product labeling.
 - Apply aquatic pesticides only to infested areas.
 - Apply herbicides at the optimal time and conditions to maximize their effectiveness and minimize amount applied. (e.g. when plants are succulent and actively growing, and water column is not turbid.) Avoid applying under conditions of high wind, water flow, or wave action.)
 - Calibrate application equipment as needed to assure the desired application rate. Check tank mix level frequently to insure proper dosage rates are being applied.
 - Close chemical intake valve when pump is not in use.
 - Upon completion, flush the tank and pump system with water for a minimum of three minutes in the application area.
 - Ensure that applicators practice herbicide use safety and that applicator equipment is properly inspected to prevent accidental leaks, spills, and hazards to applicators and the environment.
 - When copper-based herbicides are called for, a chelated form of copper that offers the greatest affinity for adherence to the target and least likelihood of settling to the bottom shall be used.

- Applicator Education on Avoiding Adverse Environmental Impacts.
 - The City will contract only with California licensed aquatic pesticide applicators. Licensed applicators are required to take periodic training on spill avoidance, proper application techniques, and avoiding environmental impacts.
 - A copy of this APAP will be provided to the contracted licensed applicator at least 30 days prior to aquatic pesticide application, and require that all primary applicators used on Marina Lagoon sign an affidavit that they have reviewed the contents and are familiar with all requirements.
 - The City's licensed applicator will be made aware of the need to request the outflow pumps be shut down for 5-7 days beginning when aquatic pesticides are applied to Zone A at the northern end of the lagoon.

- Preventing Fish Kills.
 - Experienced, licensed, and trained applicators have had training on avoiding potential fish kills; however,
 - This section is to remind applicators that they should avoid treating all of a relatively enclosed embayment or side channel at once in a manner that leaves no escape route for fish seeking higher levels of dissolved oxygen.
 - Pesticide applications in an embayment should begin at the shore furthest from the opening to the embayment and apply the pesticide outward toward this opening. Never begin pesticide applications at the mouth of the embayment and work inward as fish can be trapped by zones of low levels of dissolved oxygen.
 - Although Marina Lagoon is too large to be treated by a single pesticide application, water bodies and embayments should never be treated in their entirety with a single treatment. By treating half or less of the water body at one time, fish are left with a refugium with higher levels of dissolved oxygen should it be needed.
 - An exception to the above rule is Sonar (fluridone), as it is a systemic pesticide that settles into the sediment and enters the root system of the aquatic weeds over time, so there is no danger of fish kills, particularly at the 40 ug/l concentration at which it is typically applied. However, applications of Sonar Genesis in Marina Lagoon are limited to Zones C, D, E, and F (see Figure 3, attached). Inflow waters to Marina Lagoon enter the southern end (Zone F) of the lagoon through a tidal gate from Belmont/O'Neill Slough. Discharge of lagoon waters to San Francisco Bay occur at the north end of the lagoon (Zone A). By restricting the application of Sonar Genesis to the southern half of Marina Lagoon, there should be no discharge of fluridone to San Francisco Bay.

- General Handling, Storage and Disposal of Pesticides.
 - Always handle, store, and dispose of product in accordance with label instructions
 - Mix or load herbicides in a safe and prudent manner so as to minimize potential for spillage of raw or mixed product.
 - Mix only as much material as is necessary for treatment.
 - When changing pesticides or cleaning spray tanks, use tank rinse water as product within the application area.

- Triple rinse empty pesticide containers and dispose in accordance with label instructions recommendations of the San Mateo County Agricultural Commissioner and the manufacturer.
- Provide spill kits, store the kits near pesticides, and train employees to use them.
- Keep raw product in original container. Mix and use pesticides only in labeled containers and in accordance with local law.

Try to find a qualified user for any unwanted pesticides, or return to the manufacturer if unopened. If disposal is required, utilize the San Mateo County Very Small Quantity Generator Program (650-363-4305).

14.0 ANNUAL INFORMATION COLLECTION

The City will complete and retain all information on the previous reporting year beginning January 1 and ending December 31. When requested by the Deputy Director or Executive Officer of the Regional Water Board, the City will submit the annual information including:

1. An executive summary discussing compliance or violation of the General Permit and the effectiveness of the APAP to reduce or prevent the discharge of pollutants associated with algaecide and aquatic herbicide applications;
2. A summary of monitoring data, including the identification of water quality improvements or degradation as a result of the algaecide or aquatic pesticide application, if appropriate, and recommendations for improvements to the APAP (including proposed BMPs) and monitoring program based on the monitoring results. All receiving water monitoring data will be compared to receiving water limitations and receiving water monitoring triggers;
3. Identification of BMPs currently in use and a discussion of their effectiveness in meeting the requirements in the General Permit;
4. A discussion of BMP modifications addressing violations of the General Permit;
5. A map showing the location of each treatment area;
6. Types and amounts of algaecides and aquatic herbicides used at each application event;
7. Information on surface area and/or volume of treatment areas and any other information used to calculate dosage, concentration, and quantity of each algaecide and aquatic herbicide used;
8. Sampling results shall indicate the name of the sampling agency or organization, detailed sampling location information (including latitude and longitude or township/range/section if available), detailed map or description of each sampling area (address, cross roads, etc.), collection date, name of constituent/parameter and its concentration detected, minimum levels, method detection limits for each constituent analysis, name or description of water body sampled, and a comparison with applicable water quality standards, description of analytical QA/quality control plan. Sampling results shall be tabulated so that they are readily discernible; and

9. Summary of algaecide and aquatic herbicide application log.

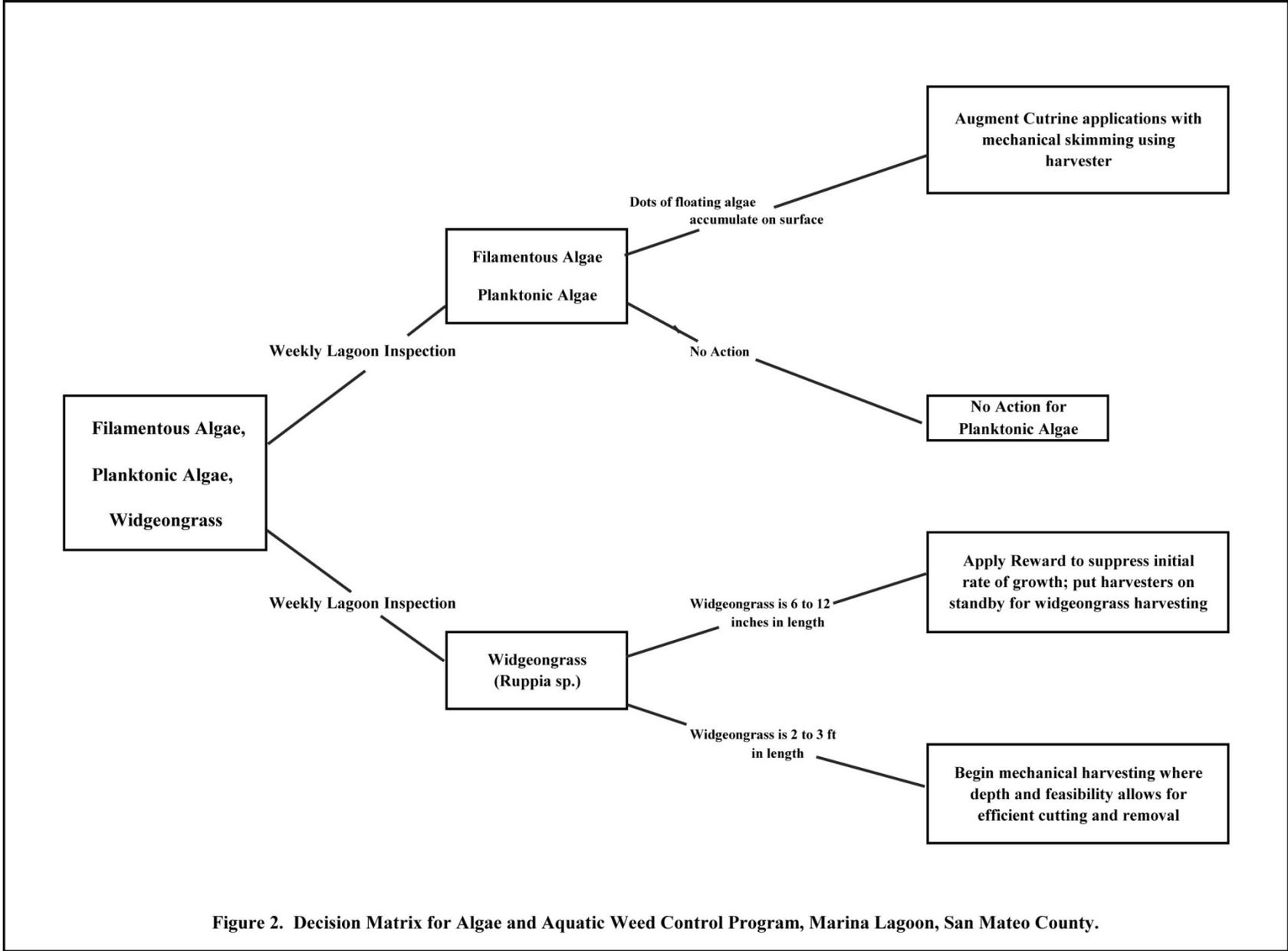


Figure 2. Decision Matrix for Algae and Aquatic Weed Control Program, Marina Lagoon, San Mateo County.

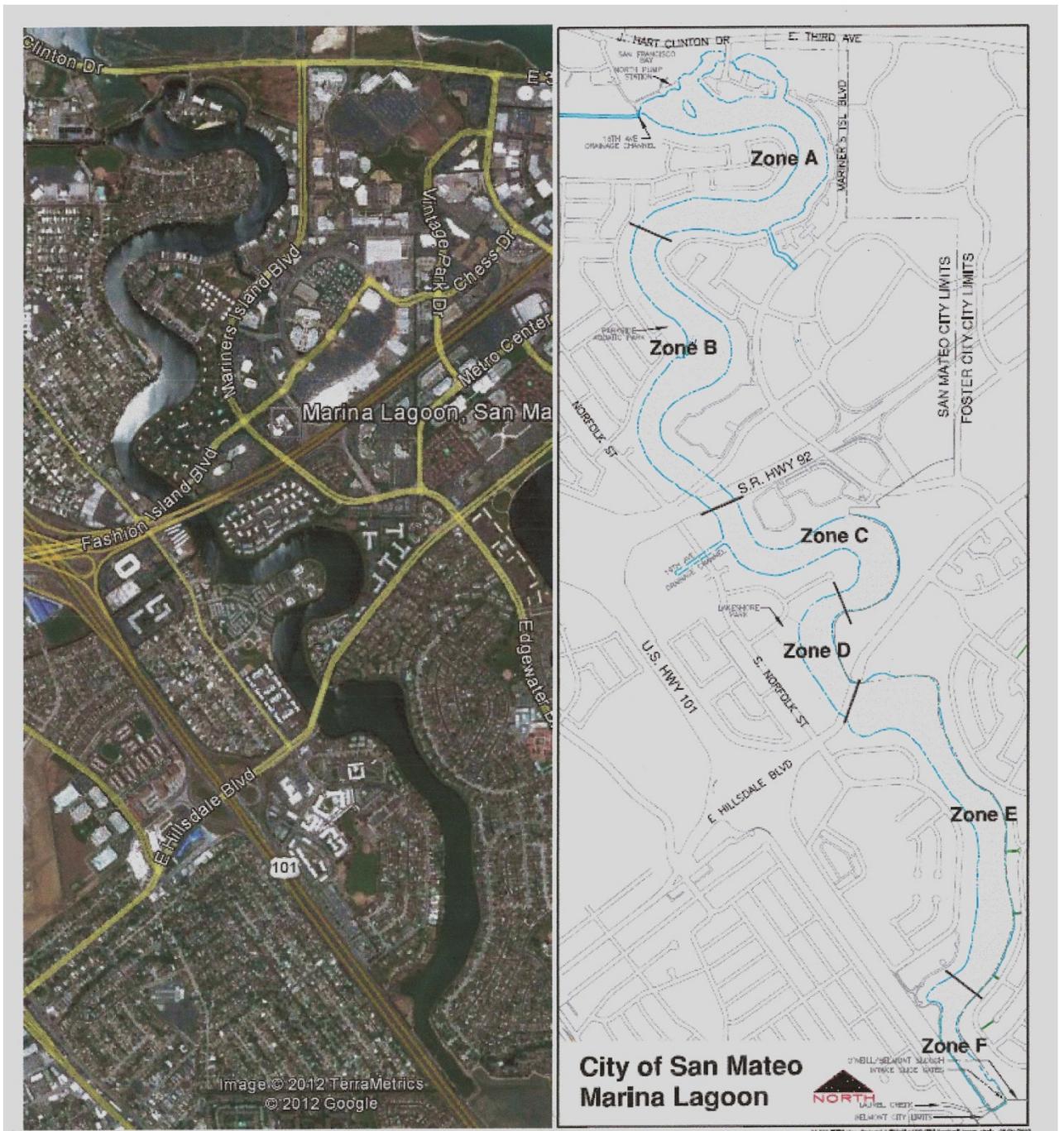


Figure 3. Zone Map of Marina Lagoon, San Mateo County, California

ATTACHMENT A

TWENTY-FOUR HOUR REPORT LOG FORM

Purpose: This verbal report must be provided to the appropriate San Francisco Bay Regional Water Quality Control Board and the State Water Board in the event that there is any noncompliance with the General NPDES Permit for Residual Aquatic Pesticide Discharges from Algae and Aquatic Weed Control Applications (General Permit), including any unexpected or unintended effect of an algaecide or aquatic herbicide use that may endanger health or the environment. Requirements for this report are found on pages 17 and 18 of the APAP for Marina Lagoon.

The report must be provided within 24 hours from the time the City or its contractors become aware of the circumstances.

State Board Contact Phone Number: _____
Name of State Board Employee Contacted: _____

SFRWQCB Contact Phone Number: _____
Name of Regional Board Employee Contacted _____

The following information shall be provided:

- a. Caller's name and phone number

Name _____

Telephone Number _____

- b. Applicator name and mailing address

City of San Mateo
330 Wwst 20th Avenue
San Mateo, CA 95814

- c. Waste Discharge Identification (WDID) number

WDID# 241AP00007

- d. Name and Telephone Number of Contact Person

Pete Dalla-Betta
Lab & Source Control Supervisor
(650-522-7388)
PDallaBetta@cityofsanmateo.com

e. How and when the City or its contractor became aware of the noncompliance

How:

When:

f. Description of the location of the noncompliance

g. Description of the noncompliance identified and the U.S. EPA pesticide registration number for each product the Discharger applied in the area of noncompliance.

Description of Noncompliance:

Products Applied Including USEPA pesticide registration numbers

h. Description of any steps that the City or its contractor has taken or will take to correct, repair, remedy, cleanup, or otherwise address any adverse effect.

Other comments provided to or received from State Board or CVRWQCB during phone call:

ATTACHMENT B

FIVE-DAY WRITTEN REPORT OUTLINE

Following submission of a twenty-four report, a written report must also be provided to the San Francisco Bay Regional Water Quality Control (SFRWQCB) Board and the State Water Board in the event that there is any noncompliance with the General NPDES Permit for Residual Aquatic Pesticide Discharges from Algae and Aquatic Weed Control Applications (General Permit), including any unexpected or unintended effect of an algaecide or aquatic herbicide use that may endanger health or the environment. Requirements for this report are found on pages 17 and 18 of the APAP for Marina Lagoon.

The written report must be provided within 5 days from the time the City or its contractor becomes aware of the circumstances. The State Water Board staff or Regional Water Board staff may waive the written report required under this provision on a case-by-case basis if an oral report has been received within 24 hours.

The report should contain the following information:

- a. Date and time the City contacted the State Water Board and the appropriate Regional Water Board notifying of the noncompliance and any instructions received from the State and/or Regional Water Board (24-Hour Reporting);
- b. A description of the noncompliance and its cause, including exact date and time and species affected, estimated number of individual and approximate size of dead or distressed organisms (other than the pests to be eliminated);
- c. Location of incident, including the names of any waters affected and appearance of those waters (sheen, color, clarity, etc);
- d. Magnitude and scope of the affected area (e.g. aquatic square area or total stream distance affected);
- e. Algaecide and aquatic herbicide application rate, intended use site (e.g., banks, above, or direct to water), method of application, and name of algaecide and herbicide product, description of algaecide and herbicide ingredients, and U.S. EPA registration number;
- f. Description of the habitat and the circumstances under which the noncompliance activity occurred (including any available ambient water data for aquatic algaecides and aquatic herbicides applied);
- g. Laboratory tests performed, if any, and timing of tests. Provide a summary of the test results within five days after they become available;

- h. If applicable, explain why the Discharger believes the noncompliance could not have been caused by exposure to the algaecides or aquatic herbicides from the Coalition's or Discharger's application; and
- i. Actions to be taken to prevent recurrence of adverse incidents.