

RECEIVED

MAR 17 2016

Attachment E – Notice of Intent

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

DIVISION OF WATER QUALITY

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.  Change of Information: WDID# 243A00002  
 C.  Change of ownership or responsibility: WDID# \_\_\_\_\_

II. DISCHARGER INFORMATION

A. Name City of San Jose Department of Transportation – Special Districts Landscape			
B. Mailing Address 1404 Mabury Road			
C. City San Jose	D. County Santa Clara	E. State CA	F. Zip 95133
G. Contact Person Dorothy Abeyta	H. E-mail address Dorothy.Abeyta@sanjoseca.gov	I. Title Special Districts Landscape Manager	J. Phone 408.794.1924

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.  Canals, ditches, or other constructed conveyance facilities owned and controlled by Discharger.  
Name of the conveyance system: \_\_\_\_\_

2.  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: Ruby Lake, Vineyard Lake, and Verona Lake

B. Regional Water Quality Control Board(s) where treatment areas are located  
(REGION 1, 2, 3, 4, 5, 6, 7, 8, or 9): Region 2 San Francisco Bay  
(List all regions where algaecide and aquatic herbicide application is proposed.)

**V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION**

A. Target Organisms: \_\_\_\_\_ Sago Pondweed (*Stuckenia pectinata*), Duck Weed (*Lemna L.*), Chara (*Chara spp.*),  
Filamentous Algae, and Planktonic Algae.

B. Algaecide and Aquatic Herbicide Used: List Name and Active ingredients  
Diquat Dibromide (Reward, Tribune)  
Sodium Carbonate Peroxyhydrate (PAK27, GreenClean, Phycomycin)  
Hydrogen Dioxide (GreenClean Liquid)  
Fluridone (Sonar Formulations)  
Endothall (Aquathol K, Hydrothol 191)

C. Period of Application: Start Date January 1st (For life of permit) End Date December 31st (For life of permit)

D. Types of Adjuvants Used: Cygnat Plus

**VI. AQUATIC PESTICIDE APPLICATION PLAN**

Has an Aquatic Pesticide Application Plan been prepared and is the applicator familiar with its contents?  
 Yes  No

If not, when will it be prepared? \_\_\_\_\_

**VII. NOTIFICATION**

Have potentially affected public and governmental agencies been notified?  Yes  No

**VIII. FEE**

Have you included payment of the filing fee (for first-time enrollees only) with this submittal?  
 YES  NO  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: Dorothy Abeyta

B. Signature:  \_\_\_\_\_

Date: March 15, 2016

C. Title: Special Districts Landscape Manager

**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 _____



## **CITY OF SAN JOSE AQUATIC PESTICIDE APPLICATION PLAN (APAP)**

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

**Submitted To:**

**Mr. W. Russell Norman, P.E.  
State Water Resources Control Board  
1001 I Street, 15<sup>th</sup> Floor  
Sacramento, CA 95814**

**Prepared For:**

**City of San Jose  
Department of Transportation – Special Districts Landscape  
1404 Mabury Road  
San Jose, CA 95133**

**Prepared By:**

**Waterworks Industries Inc.  
930 Shiloh Rd, Bldg. 38, Suite D  
Windsor, CA 95492**

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## CERTIFICATION

“I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure 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 and imprisonment for knowing violations.”



---

Dorothy Abeyta  
City of San Jose  
Department of Transportation – Special Districts Landscape  
1404 Mabury Road  
San Jose, CA 95133



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Tyler Fowler  
Waterworks Industries Inc.  
930 Shiloh Rd., Bldg. 38, Suite D  
Windsor, CA 95492

## **BACKGROUND**

On March 12, 2001, the Ninth Circuit Court of Appeals held that discharges of pollutants from the use of aquatic pesticides in waters of the United States require coverage under an NPDES permit. (*Headwaters, Inc. v. Talent Irrigation District*).<sup>3</sup> The *Talent* decision was issued just prior to the major season for applying aquatic pesticides.

Because of the serious public health, safety, and economic implications of delaying pesticide applications, in 2001 the State Water Board adopted Water Quality Order (Order) No. 2001-12-DWQ, Statewide General NPDES Permit for Discharges of Aquatic Pesticides to Waters of the United States on an emergency basis to provide immediate NPDES permit coverage for broad categories of aquatic pesticide use in California.

Order No. 2001-12-DWQ expired on January 31, 2004. In 2004, it was replaced by two general permits: a vector control permit for larvicides (Order No. 2004-0008-DWQ) and a weed control permit (Order No. 2004-0009-DWQ). The State Water Board determined that adoption of these two permits was consistent with the Ninth Circuit decisions.

The 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. Water Quality Order No. 2013-0002-DWQ General Permit No.

CAG990005 was adopted by the State Water Resources Control Board on March 5, 2013 and became effective on December 1, 2013. This supersedes Order No. 2004-0009-DWQ except for enforcement purposes, and in order to meet the provisions contained in division 7 of the Water Code (commencing with §13000) and regulations adopted thereunder, and the provisions of the CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

## **GENERAL PERMIT COVERAGE**

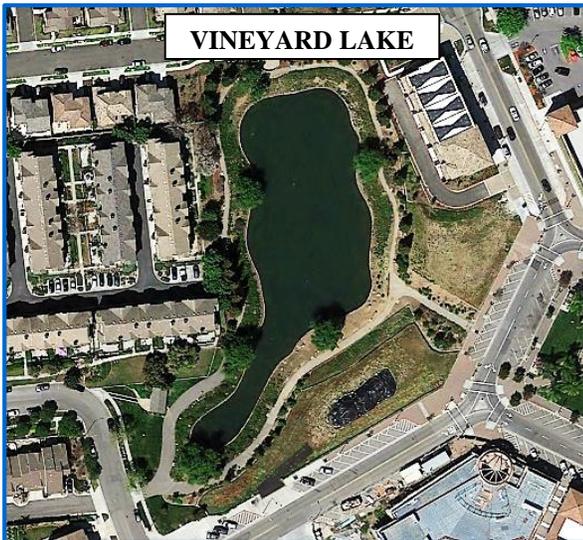
This General Permit covers the point source discharge to waters of the United States of residues resulting from pesticide applications using products containing 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, sodium carbonate peroxyhydrate, and triclopyr-based algaecides and aquatic herbicides, and adjuvants containing ingredients represented by the surrogate nonylphenol.

This General Permit covers only discharges of algaecides, and aquatic herbicides that are currently registered for use in California, or that become registered for use and contain the above-listed active ingredients and ingredients represented by the surrogate of nonylphenol.

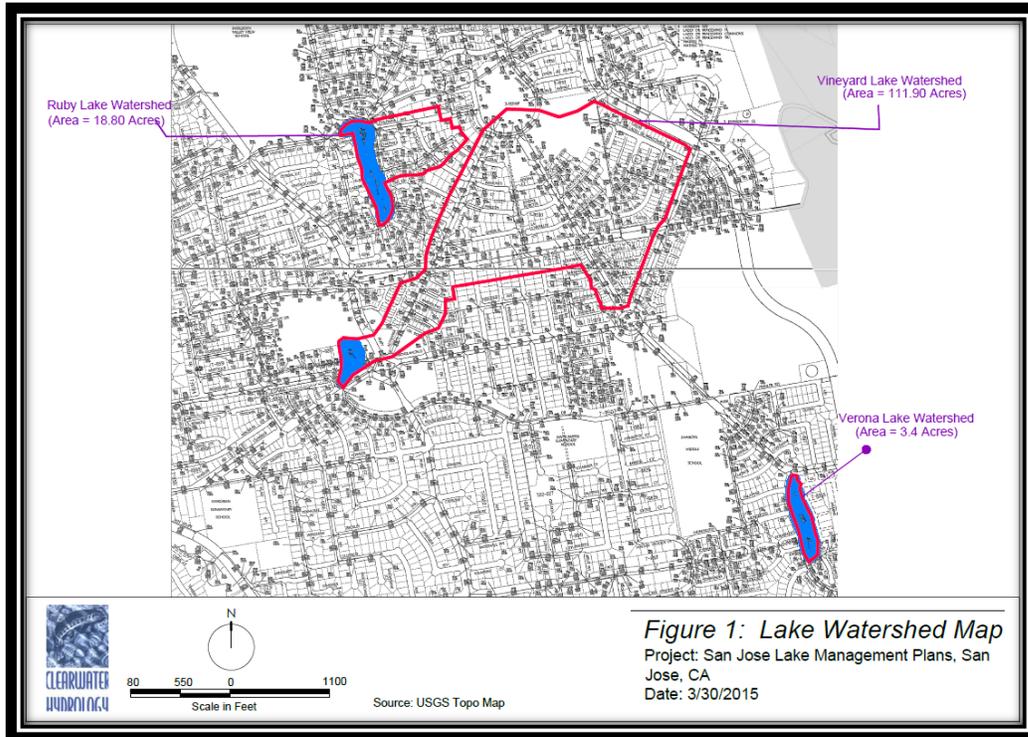
## **AQUATIC PESTICIDE APPLICATION PLAN**

The following Aquatic Pesticide Application Plan (APAP) for the City of San Jose is outlined below and is designed to follow the Statewide General NPDES Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications, Water Quality Order No. 2013-0002-DWQ, General Permit No. CAG990005, Section VIII.C.

### **DESCRIPTION OF THE SYSTEMS**



Vineyard Lake, Ruby Lake, and Verona Lake are all ornamental manmade lakes that were also designed to be used as urban storm water detention lakes. The three lakes are managed by the City of San Jose Department of Transportation's Special Districts Landscape division and are located within the Community Services District 2/3. All three lakes have City potable water lines plumbed into them, which keep the lakes full to offset evaporation during the spring and summer months. Water also enters the three lakes from runoff during storm events from the surrounding watershed as seen in the watershed map below created by Clearwater Hydrology (Draft Lake Water Quality Assessment Report) for the City of San Jose.



Water exits each system as outlined below:

- Vineyard Lake - A sump and float-operated pump discharge lake water in a 12-inch storm drain to a 72-inch storm drain line under Cortona Drive and Silverland Drive which eventually discharge to Thompson Creek, a major tributary of Coyote Creek, which drains to South San Francisco Bay.
- Ruby Lake - A gravity line at the northwest corner of the lake discharges excess lake waters that accumulate during watershed storm water inflow events into a 54-inch storm drain that connects to the Vintage Crest Drive system. Ultimately, these flows discharge to Thompson Creek just downstream of the Cortona/Silverland line, near San Felipe Road, then to Coyote Creek and South San Francisco Bay.
- Verona Lake - Two capped outlet pipes with drilled holes to allow water but not debris from exiting the lower lake discharge by gravity to the 54-inch storm drain line in Verona

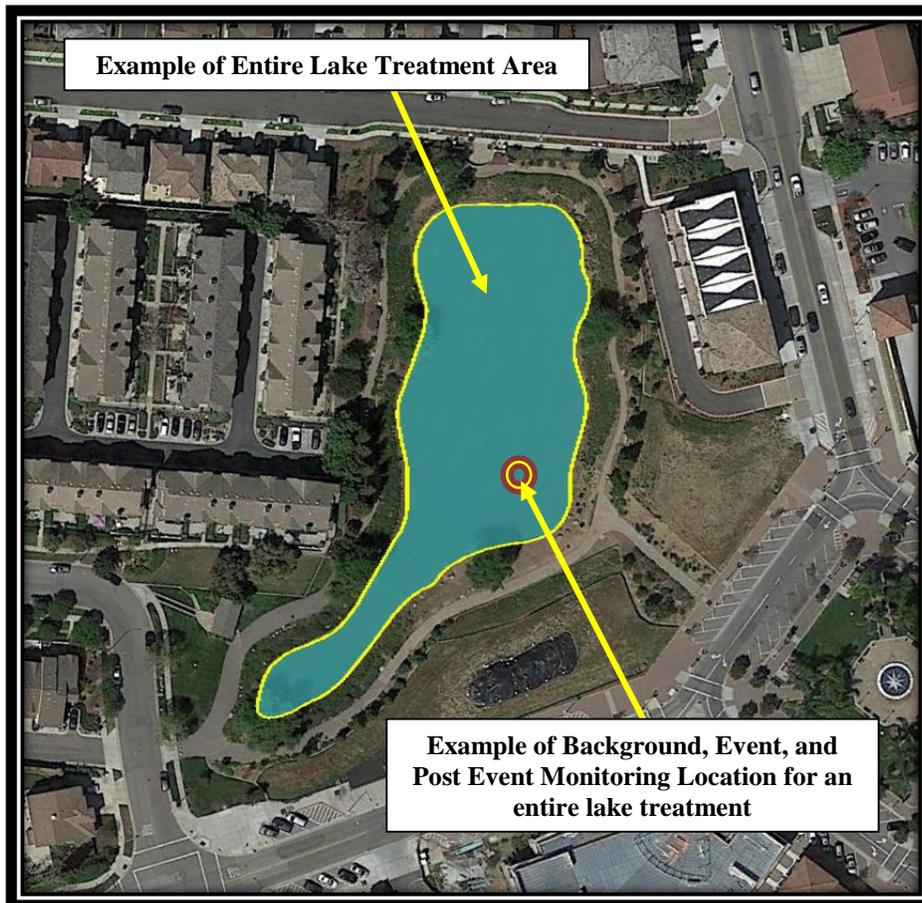
Avenue which eventually reaches the Fowler Avenue storm drain line, and Thompson Creek which routes to Coyote Creek and South San Francisco Bay.

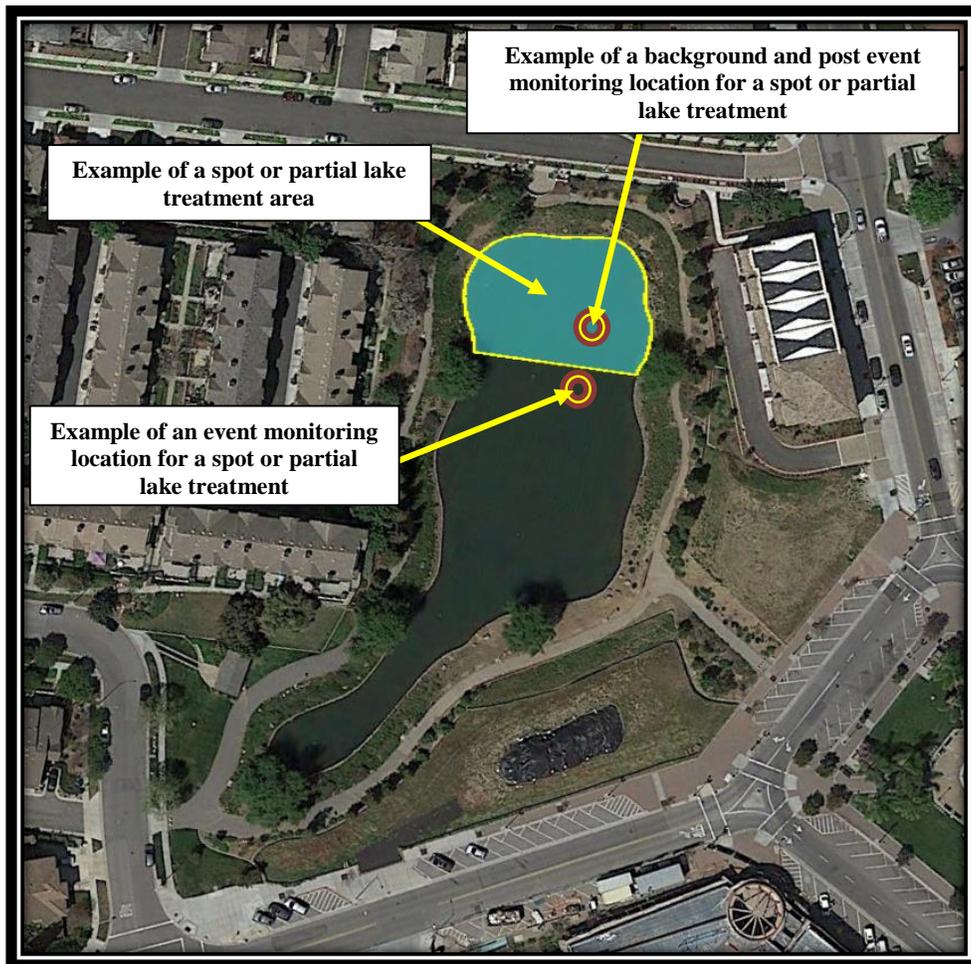
All three lakes have overflow systems in place that drain to the storm water system, however during the spring and summer months all three lakes are maintained at a level that does not release water into the storm drain system. Therefore all three lakes are operated as closed / static systems not flow through systems.

## **DESCRIPTION OF THE TREATMENT AREA**

**VINEYARD LAKE** (0.95 Surface Acres / 41,500 Square Feet) (9.0 Foot Maximum Depth) (4.0 Foot Average Depth)

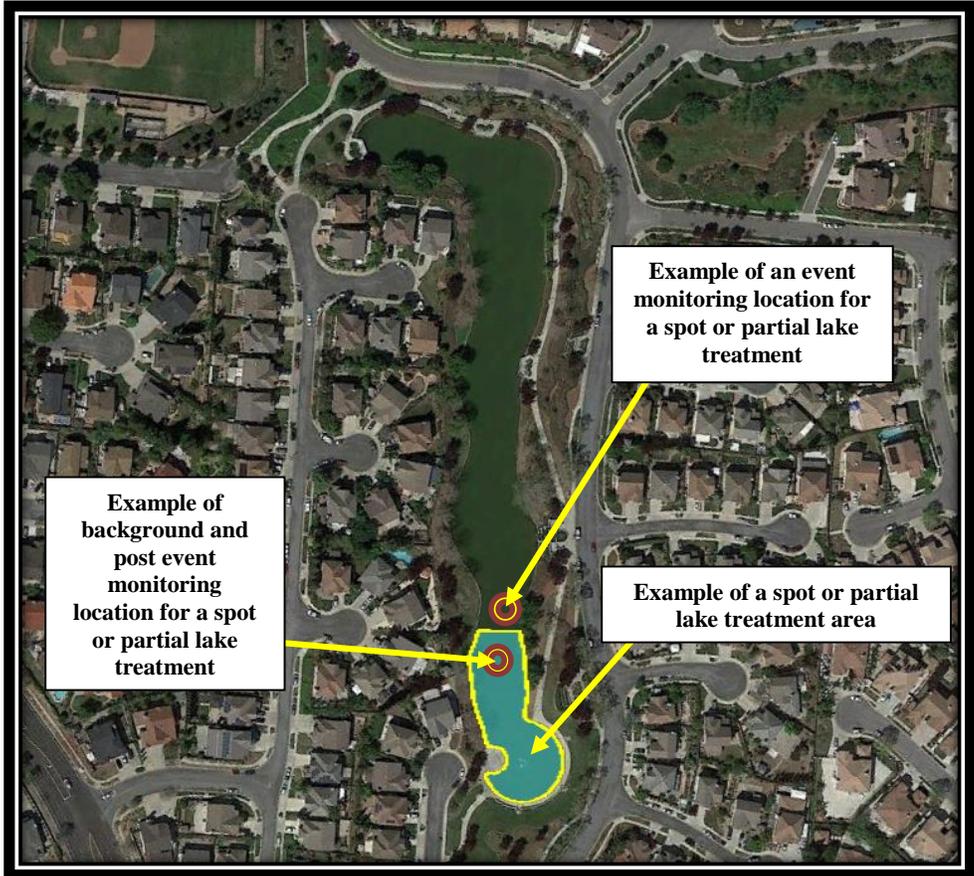
The treatment area in Vineyard Lake can be the entire lake for control of aquatic weeds and algae or the treatment area could be a spot or partial lake treatment. The two maps below show examples of an entire lake treatment and a spot or partial lake treatment. The maps also include example monitoring locations for each treatment.





**RUBY LAKE** (2.42 Surface Acres / 105,389 Square Feet) (6.0 Foot Maximum Depth) (3.0 Foot Average Depth)

The treatment area in Ruby Lake can be the entire lake for control of algae or the treatment area could be a spot or partial lake treatment for control of aquatic weeds or algae. The two maps below show examples of an entire lake treatment and a spot or partial lake treatment. The maps also include example monitoring locations for each treatment.



**VERONA LAKE** (2.42 Surface Acres / 105,389 Square Feet) (6.0 Foot Maximum Depth) (3.0 Foot Average Depth)

The treatment area in Ruby Lake can be the entire lake for control of algae or the treatment area could be a spot or partial lake treatment for control of aquatic weeds or algae. The two maps below show examples of an entire lake treatment and a spot or partial lake treatment. The maps also include example monitoring locations for each treatment.





## AQUATIC VEGETATION AND ALGAE BEING CONTROLLED

All three lakes currently and historically have nuisance growths of Sago Pondweed (*Stuckenia pectinata*), Duck Weed (*Lemna L.*), Chara (*Chara spp.*), Filamentous Algae, and Planktonic Algae. The submerged aquatic weeds, branched algae, and filamentous algae growth primarily impact the fountain and circulation system operations by clogging intakes and pumps. Nuisance growths also result in aesthetic issues for the surrounding area as the lakes are focal points of the neighborhoods they are located in. The planktonic algae primarily impacts aesthetics, and has potential (Harmful Blue Green Algae Blooms) health hazards for human and animal contact with the lakes. Outlined below are potential triggers that would determine a spot treatments versus an entire lake treatment.

- If growth of one of the aquatic weed species described above has a localized bloom that is caught early it could be spot treated to eliminate the growth.

- If growth of one of the aquatic weed species described above blooms quickly and spreads throughout the entire lake creating nuisance conditions throughout, an entire lake treatment could be performed.
- Planktonic algae blooms impact the entire lake system so generally entire lake treatments would be needed to eliminate algae blooms. However low dissolved oxygen levels could require multiple smaller treatments.
- Filamentous algae in any of these systems could grow along a specific shoreline or can be a floating mat that could be spot treated.

**AQUATIC HERBICIDES AND ALGAECIDES TO BE USED, THEIR DEGREDAATION BYPRODUCTS, METHODS OF APPLICATION. AND ADJUVANTS AND SURFACTANTS TO BE USED**

Below is a table of the herbicides and algaecides that would be utilized for control of the plant and algae species listed in the paragraph above. The herbicide diquat to date has not been used in any of the three lakes and would only be used as a last measure if other active ingredients are not effective in eliminating nuisance conditions. Various adjuvants and surfactants labeled for aquatic use may be used in combination with these herbicides and algaecides. Adjuvants containing ingredients represented by the surrogate nonylphenol will not be used in the lakes.

<b>Herbicide Active Ingredient</b>	<b>Degradation Byproducts</b>	<b>Application Technique</b>
Fluridone	n-methyl formamide (NMF) 3-trifluoromthyl benzoic acid	Boom, Spreader
Endothall	Glutamic acid	Boom, handgun, Spreader
Diquat Dibromide	Diquat binds with organic matter in the sediment indefinitely. It does not degrade and will accumulate in sediments	Boom, handgun
<b>Algaecide Active Ingredient</b>		
Sodium Carbonate Peroxyhydrate	Breaks down to sodium carbonate and hydrogen peroxide in water. Hydrogen Peroxide breaks down into water and oxygen.	Spreader
Hydrogen Dioxide	Water and Oxygen	Boom, handgun
Endothall	Glutamic acid	Boom, handgun, Spreader
Adjuvants and surfactants could be used based on recommendations and the label. Adjuvants and surfactants containing nonylphenol will not be used.		

## **FACTORS INFLUENCING THE DECISION TO USE HERBICIDES AND ALGAECIDES**

The factors influencing the use of herbicides and algaecides are based on the nuisance threshold of the aquatic weed infestation or algae bloom. All three lakes are managed with an Integrated Pest Management (IPM) approach that includes the use of aeration, circulation, beneficial bacteria, bio-filtration, mechanical removal, and manual removal. When these alternative measures are not taking care of the nuisance growth of aquatic weeds or algae, aquatic herbicides and algaecides would be used to achieve the desired control before the growth has a chance to impact the beneficial uses of the system.

## **GATES AND CONTROL STRUCTURES**

- Vineyard Lake - A sump and float-operated pump discharges lake water into a 12-inch storm drain if water levels get too high during storm events. In the unlikely event that there is a storm event soon after an herbicide or algaecide application the sump pump will be disconnected by the maintenance contractor / applicator so that treated lake water will not leave the lake system until residue levels are below the acceptable threshold.
- Ruby Lake - A gravity line at the northwest corner of the lake discharges excess lake waters that accumulate during watershed storm water inflow events into a 54-inch storm drain. In the unlikely event that there is a storm event soon after an herbicide or algaecide application the maintenance contractor / applicator will put a cap on the gravity line so that treated lake water will not leave the lake system until residue levels are below the acceptable threshold.
- Verona Lake - If water levels get too high during storm events, two capped outlet pipes with drilled holes allow water but not debris from exiting the lower lake to discharge by gravity to the 54-inch storm drain line in Verona Avenue. In the unlikely event that there is a storm event soon after an herbicide or algaecide application the maintenance contractor / applicator will replace the cap with drilled holes with solid caps so that treated lake water will not leave the lake system until residue levels are below the acceptable threshold.

## **STATE IMPLEMENTATION POLICY (SECTION 5.3) EXCEPTIONS**

The City of San Jose Department of Transportation – Special Districts Landscape has not applied for or been granted a short-term or seasonal exception under State Water Board Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California.

## DESCRIPTION OF MONITORING AND REPORTING PROGRAM (MRP)

Section 122.48 of title 40 of the Code of Federal Regulations (40 C.F.R. §122.48) requires that all NPDES permits specify monitoring and reporting requirements. As such the following monitoring and reporting program has been developed for SDC under the guidance of Attachment C –Monitoring and Reporting Program as well as MRP guidelines table attached below.

**Table C-1. 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 <sup>2</sup>	°F	Grab <sup>4</sup>	5	Background, Event and Post-event Monitoring	6
	2. pH <sup>3</sup>	Number				
	3. Turbidity <sup>3</sup>	NTU				
	4. Electric Conductivity <sup>3</sup> @ 25°C	µmhos/cm				
Chemical	1. Active Ingredient <sup>7</sup>	µg/L	Grab <sup>4</sup>	5	Background, Event and Post-event Monitoring	6
	2. Nonylphenol <sup>8</sup>	µg/L				
	3. Hardness (if copper is monitored)	mg/L				
	4. Dissolved Oxygen <sup>2</sup>	mg/L				

<sup>1</sup> All applications at all sites.  
<sup>2</sup> Field testing.  
<sup>3</sup> Field or laboratory testing.  
<sup>4</sup> 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.  
<sup>5</sup> 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.  
<sup>6</sup> Pollutants shall be analyzed using the analytical methods described in 40 C.F.R. part 136.  
<sup>7</sup> 2,4-D, acrolein, dissolved copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, and triclopyr.  
<sup>8</sup> It is required only when a surfactant is used.

## MONITORING FREQUENCY AND LOCATIONS

Ruby Lake, Vineyard Lake, and Verona Lake are all small lakes that have the same environmental setting throughout the lakes. All three lakes are also operated in a static condition. Therefore monitoring locations will be selected to represent the two types of treatments performed. The monitoring locations for entire lake treatments will be selected from a location close to the lake outlets. The background and post event monitoring locations for

spot lake treatments in all three lakes will be within the treatment areas. The event monitoring locations for spot lake treatments in all three lakes will be collected immediately outside of the treatment areas.

Samples will be collected from a minimum of six application events for each active ingredient in each environmental setting. If there are less than six application events in a year, samples will be collected at each application event for each active ingredient in each environmental setting. 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.

**Background Monitoring:** Background monitoring samples will be collected upstream at the time of the application event or in the application area just prior to (up to 24 hours in advance of) the application event.

**Event Monitoring:** Event monitoring samples will be collected immediately downstream of the treatment area in flowing waters or immediately outside of the treatment area in non-flowing waters, immediately after the application event, but after sufficient time has elapsed such that treated water would have exited the treatment area.

**Post-Event Monitoring:** Post-event monitoring samples will be collected within the treatment area within one week after application.

## **SAMPLE COLLECTION METHODS**

Samples will 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. A horizontal / vertical Van Dorn sampler, Kemmerer sampler, or a telescopic / long handled sampling pole will be used to collect the samples at the depths greater than two foot.

All steps will be taken to prevent samplers from physically entering the water body to collect samples. If it is required because a sampling location cannot be reached by shoreline, boat, dock, etc... the following steps will be taken

- The sampler will enter the waterbody downstream or down flow of the water body to prevent disturbance in the sampling location.
- All personal protection equipment, (PPE's) including a life vest will be worn to protect the sampler

Sampling personnel who collect samples from all three lakes will be required to wear powder free plastic or nitrile gloves when preparing the sample bottles and equipment, washing or decontaminating sampling equipment and while performing the following procedures:

When collecting an unpreserved sample with a water bottle sampler (by hand) the following steps will be followed:

- The sample container will be lowered to mid water column depth if the depth is less than three feet. The capped end of the container will be placed away from the flow of water to minimize potential debris from entering the sample.
- Once the container is at the correct depth and positioned correctly the cap will be removed to allow the sample container to fill. Once full the cap will be replaced and the pre-labeled container will be removed from the water and placed in a cooler.

When collecting samples with a water bottle sampler (by hand) with bottles containing preservatives, a clean unpreserved sample bottle will be used to collect the sample. The collection procedure will be the same steps outlined above with the additional following step:

- Remove the cap and immediately transfer the sample from the unpreserved sample bottle to the pre-labeled sample bottle containing the appropriate preservative. Cap the bottle and place in the cooler.

When collecting samples with a telescopic / long handled sampling pole the instrument will be thoroughly washed with appropriate cleaner and distilled water before use. The sampler will then be washed once again with the water from the new sampling location before samples are collected. Once the sampler is ready the following steps will be followed

- Invert and lower the telescopic / long handled sampling pole sampler to three feet below the surface of the water body or at mid water column depth if the depth is less than three feet.
- Turn the inverted telescopic / long handled sampling pole sampler upright at the desired depth to fill the sample and then remove from the water.
- Immediately transfer the sample from the telescopic / long handled sampling pole sampler to the pre-labeled unpreserved or preserved sample bottle. Cap the new bottle and place in the cooler.

When collecting a sample with a subsurface water sampler (Horizontal / Vertical Van Dorn sampler, Kemmerer sampler) the following steps will be followed:

- Lower the subsurface water sampler to three feet below the surface of the water body or at mid water column depth if the depth is less than three feet
- Once it is confirmed that the sampler is at the correct depth, release the weighted messenger or comparable trigger device to close the sampling device
- Raise the sampler back to the shoreline or collection vessel and immediately transfer the sample to the pre-labeled unpreserved or preserved sample bottle. Cap the new bottle and place in the cooler.

## **FIELD SAMPLING EQUIPMENT CHECKLIST**

- NPDES treatment and monitoring forms
- Chain of Custody (COC) forms
- Non-powdered plastic or nitrile gloves
- Boots or waders if needed
- Appropriate sampling bottles and labels from or approved by the certified laboratory being used for analysis.
- Ice Chest / Cooler with ice or ice packs
- YSI data sonde or equivalent - for onsite field measurements such as electric conductivity, dissolved oxygen, pH, turbidity, and temperature.
- Backup batteries
- Field logbook and QA/QC manual
- Sampling devices for collecting subsurface samples
- Distilled and deionized water
- Eyewash
- GPS for recording sampling locations
- Plastic bags to separate out samples and protect forms and manuals
- Tape
- Shipping labels
- Secchi Disk

All laboratory analyses will be conducted at a laboratory certified for such analyses by the California Department of Public Health in accordance with California Water Code section 13176. The chosen Laboratory that will perform sample analyses will be identified in all monitoring reports. The receiving water limitations listed in the permit that may be sampled for are listed in the table below.

## SAMPLE PRESERVATION AND DELIVERY

**Table 3. Receiving Water Limitations**

Constituent/ Parameter	BENEFICIAL USE <sup>1</sup>			Basis
	MUN, µg/L	WARM or COLD, µg/L	Other than MUN, WARM, or COLD, µg/L	
2,4-D	70			U.S. EPA MCL
Acrolein <sup>2</sup>	320	21	780	U.S. EPA Water Quality Criteria, 1986.
Copper <sup>2</sup>				Dissolved Freshwater <sup>3</sup> Copper Chronic = $0.960 \exp\{0.8545 [\ln(\text{hardness}^4)] - 1.702\}$ <sup>5,6</sup>  Dissolved saltwater <sup>3</sup> Copper Chronic = $0.83 \exp\{0.8545 [\ln(\text{hardness}^4)] - 1.702\}$ <sup>5,6</sup>  California Toxics Rule
Diquat	20			U.S. EPA MCL
Endothall	100			U.S. EPA MCL
Fluridone	560			U.S. EPA Integrated Risk Information System
Glyphosate	700			U.S. EPA MCL
Nonylphenol				Freshwater Chronic Criterion = 6.6 µg/L  Saltwater Chronic Criterion = 1.7 µg/L  U.S. EPA National Recommended Ambient Water Quality Criteria
Toxicity	Algaecide and aquatic herbicide applications shall not cause or contribute to toxicity in receiving water(s).			Regional Water Boards' Basin Plans

Notes:

1. See Regional Water Boards' Water Quality Control Plans (Basin Plans) for beneficial use definitions.
2. Public entities and mutual water companies\* listed in Attachment G are not required to meet these limitations in receiving waters during the exception period described in the APAP and Section VIII.C.10 below.
3. For waters in which the salinity is equal to or less than 1 part per thousand 95% or more of the time, the freshwater criteria apply. For waters in which the salinity is equal to or greater than 10 parts per thousand 95% or more of the time, saltwater criteria apply. For waters in which the salinity is between 1 and 10 parts per thousand, the applicable criteria are the more stringent of the freshwater or saltwater criteria.
4. For freshwater aquatic life criteria, waters with a hardness 400 mg/L or less as calcium carbonate, the actual ambient hardness of surface water shall be used. For waters with a hardness of over 400 mg/L as calcium carbonate, a hardness of 400 mg/L as calcium carbonate shall be used with a default Water-Effect Ratio of 1.
5. Values should be rounded to two significant figures.
6. This limitation does not apply to the Sacramento River and its tributaries above the State Highway 32 Bridge at Hamilton City. See Table III-1 of the Basin Plan for the Sacramento and San Joaquin River Basins for copper limitation.

Based on sample requirements samples will either be collected in preserved or unpreserved containers. Samples collected in unpreserved containers will be preserved at the laboratory when the sample(s) are delivered if required.

All samples will be placed on ice in a cooler immediately following the collection of the sample(s). Background, Event, and Post Event monitoring samples will be separated and properly labeled in plastic bags within the cooler to avoid any cross contamination. Delivery of the sample(s) will occur following the sampling event if feasible. If samples cannot be delivered on the day of the sampling event they will remain on ice in a cooler until delivered to the lab within the appropriate holding time.

## **CHAIN OF CUSTODY**

All samples collected and submitted to the lab for analysis will be accompanied by a chain of custody (COC) record. The COC form will include at a minimum:

- A unique field sample number which identifies each individual sample to be analyzed
- Location
- The method/parameter for analysis
- Collection date and time
- Sampler information
- Custody transfer signatures

When transferring the samples into the custody of the laboratory the individuals relinquishing and receiving the samples will sign, date, and record the time the transfer was made on the COC form. The original COC form will remain with the lab and a copy will be given to the individuals delivering the samples which will be placed with the monitoring forms in the project folder or binder. If samples are shipped to the laboratory a signed copy of the COC will be included with the shipment and a signed copy will be requested from the lab. The shipping information and COC copy would also be placed with the monitoring forms in the project folder or binder.

## **SAMPLE CONTAMINATION PREVENTION PROCEDURES**

Personal decontamination will be done in an area detached from sampling locations in order to prevent contamination at sampling points. All personal protective equipment (PPE) such as Tyvek suits, disposable gloves, and respirators used in the application process will be removed and disposed of in this area using sealed bags / containers for proper disposal. Sampler(s) will wash hands and face with soap and clean water. New boots and safety glasses will be worn for sampling. The used boots and glasses will be containerized until they are washed with an appropriate solution offsite.

New PPE's will be worn for sampling and disposable gloves will be changed at each sampling location.

Samples will be collected away from any equipment, containers, or PPE's that were used as part of the application process. After each sampling event all sampling collection and water quality monitoring equipment will be thoroughly washed with appropriate cleaner and distilled water. All equipment will be washed once again with the water from the new sampling location before samples or readings are collected.

## **FIELD SAMPLING PROCEDURES**

Visual parameters including the monitoring area description, appearance of the waterway, weather conditions, and notes on receiving water conditions will be summarized on the NPDES Monitoring Data Form below on page 21.

In conducting the receiving water sampling, a log will be kept of the receiving water conditions throughout the reach bounded by the treatment area. Attention shall be given to the presence or absence of:

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

All monitoring and treatment forms will be placed in a project logbook or binder designated for all project documentation.

Field measured water quality parameters including Temperature, pH, Turbidity, Dissolved Oxygen and Electrical Conductivity will be measured in the field as grab samples with a multi-parameter data logging meter. (YSI, Horiba, or equivalent) Field personnel will be properly trained on how to operate the meter to ensure quality control. The meter will be calibrated regularly following manufacturer's specifications. Methods will conform to United States Environmental Protection Agency (U.S. EPA) guidelines or to procedures approved by the State Water Board and the appropriate Regional Water Board.

## NPDES Monitoring Data Form

Application and Monitoring area location:	Sampler	Herbicide or Algaecide (pesticide used, surfactant used)
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Sampler Certification: I [ _____ ] certify that the Aquatic Pesticide Application Plan has been followed	
Signature: _____	Date: _____

**Background Monitoring** - Background monitoring samples shall be collected upstream at the time of the application event or in the application area just prior to (up to 24 hours in advance of) the application event.

Date:	Time:	GPS Coordinates:	
<b>Visual Monitoring</b>			
Weather: (fog, rain, cloudy, etc.)			Wind Speed: (mph)
Appearance of waterway: (sheen, color, clarity, films, coatings, etc.)			
Floating / Suspended Matter:		Bottom Deposits: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Aquatic Life: Yes <input type="checkbox"/> No <input type="checkbox"/> Description:		Nuisance Conditions Yes <input type="checkbox"/> No <input type="checkbox"/>	
Fungi, Slimes, Objectionable Growth:		Water Clarity: (Secchi)	
<b>Water Sampling Parameters (Physical and Chemical Monitoring)</b>			
Temp (F°)	pH (Number)	Electric Conductivity (umhos / cm)	Turbidity (NTU)
Active Ingredient	Hardness (mg CaCO <sub>3</sub> )	Sal (ppt)	Nonylphenol (ug/l)
			DO (mg/l)

**Event Monitoring** - Event monitoring samples shall be collected immediately downstream of the treatment area in flowing waters or immediately outside of the treatment area in non-flowing waters, immediately after the application event, but after sufficient time has elapsed such that treated water would have exited the treatment area.

Date:	Time:	GPS Coordinates:	
<b>Visual Monitoring</b>			
Weather: (fog, rain, cloudy, etc.)			Wind Speed: (mph)
Appearance of waterway: (sheen, color, clarity, films, coatings, etc.)			
Floating / Suspended Matter:		Bottom Deposits: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Aquatic Life: Yes <input type="checkbox"/> No <input type="checkbox"/> Description:		Nuisance Conditions Yes <input type="checkbox"/> No <input type="checkbox"/>	
Fungi, Slimes, Objectionable Growth:		Water Clarity: (Secchi)	
<b>Water Sampling Parameters (Physical and Chemical Monitoring)</b>			
Temp (F°)	pH (Number)	Electric Conductivity (umhos / cm)	Turbidity (NTU)
Active Ingredient	Hardness (mg CaCO <sub>3</sub> )	Sal (ppt)	Nonylphenol (ug/l)
			DO (mg/l)

**Post-Event Monitoring** - Post-event monitoring samples shall be collected within the treatment area within one week after application.

Date:	Time:	GPS Coordinates:	
<b>Visual Monitoring</b>			
Weather: (fog, rain, cloudy, etc.)			Wind Speed: (mph)
Appearance of waterway: (sheen, color, clarity, films, coatings, etc.)			
Floating / Suspended Matter:		Bottom Deposits: Yes <input type="checkbox"/> No <input type="checkbox"/>	
Aquatic Life: Yes <input type="checkbox"/> No <input type="checkbox"/> Description:		Nuisance Conditions Yes <input type="checkbox"/> No <input type="checkbox"/>	
Fungi, Slimes, Objectionable Growth:		Water Clarity: (Secchi)	
<b>Water Sampling Parameters (Physical and Chemical Monitoring)</b>			
Temp (F°)	pH (Number)	Electric Conductivity (umhos / cm)	Turbidity (NTU)
Active Ingredient	Hardness (mg CaCO <sub>3</sub> )	Sal (ppt)	Nonylphenol (ug/l)
			DO (mg/l)

## **QUALITY ASSURANCE-QUALITY CONTROL**

The City of San Jose Department of Transportation – Special Districts Landscape and its maintenance contractor will be required to keep a Quality Assurance-Quality Control maintenance and calibration manual for any onsite field measurements such as electrical conductivity, dissolved oxygen, pH, turbidity, and temperature. The Quality Assurance-Quality Control Program must conform to United States Environmental Protection Agency (U.S. EPA) guidelines or to procedures approved by the State Water Board and the appropriate Regional Water Board. The manual containing the steps followed in this program will be kept by the City of San Jose Department of Transportation – Special Districts Landscape’s maintenance contractor and will be available for inspection by the State Water Board and the appropriate Regional Water Board staff.

## **DATA AND RECORDS MANAGEMENT**

All sampling, treatment, and reporting records will be filed and stored at Waterworks Industries Inc.’s (current maintenance contractor) main office in Windsor, CA that will be available for inspection by the State Water Board and the appropriate Regional Water Board staff.

## **REPORTING REQUIREMENTS**

### **Annual Report**

The City of San Jose Department of Transportation – Special Districts Landscape will submit to the Deputy Director and the appropriate 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 SDC shall provide the Deputy Director and the appropriate Regional Water Board Executive Officer a certification that algaecide and aquatic herbicide application activities did not result in a discharge to any water body. The annual report will contain the following information:

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 best management practices (BMPs)] and monitoring program based on the monitoring results.
3. All receiving water monitoring data will be compared to receiving water limitations and receiving water monitoring triggers.

4. Identification of BMPs currently in use and a discussion of their effectiveness in meeting the requirements in this General Permit. And if needed, 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 will indicate the name of the sampling agency or organization, detailed sampling location information (including latitude and longitude) 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.
9. Summary of algaecide and aquatic herbicide application log.
10. The City of San Jose Department of Transportation – Special Districts Landscape will submit the annual report before March 1st of the following year. The annual report will contain all data from January 1st through December 31st of the previous year.

## **Twenty Four Hour Report**

The City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor will report to the State Water Board and appropriate Regional Water Board any noncompliance, including any unexpected or unintended effect of an algaecide or aquatic herbicide use that may endanger health or the environment.

Any information will be provided orally within 24 hours from the time the City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor becomes aware of the circumstances and will include the following information:

- a. The caller's name and telephone number;
- b. Applicator name and mailing address;
- c. Waste Discharge Identification (WDID) number;
- d. The name and telephone number of a contact person;
- e. How and when the City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor became aware of the noncompliance;
- 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 the noncompliance;
- h. Description of any steps that the City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor took or will take to correct, repair, remedy, cleanup, or otherwise address any adverse effects. If the City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor is unable to notify the State and the appropriate Regional Water Board within 24 hours, the City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor will do so as soon as possible and also provide the rationale for why the City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor was unable to provide such notification within 24 hours.

### **Five-Day Written Report**

The City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor will also provide a written submission within five (5) days of the time the City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor becomes aware of the noncompliance. The written submission will contain the following information:

- a. Date and time the City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor 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.
- 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 Coalition or Discharger believes the noncompliance could not have been caused by exposure to the algaecides or aquatic herbicides from the City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor application;

i. 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.

## **BEST MANAGEMENT PRACTICES TO BE IMPLEMENTED**

### **Measures to prevent algaecide and aquatic herbicide spill and for spill containment during the event of a spill**

The following preventative measures will be taken to prevent algaecide and herbicide spills.

- Applicators applying herbicides and algaecides will have State of California Department of Pesticide Regulation (DPR) issued Qualified Applicator Licenses, (QAL) Qualified Applicator Certificates, (QAC) or be under the supervision of a licensed applicator.
- Applicators receive annual and project specific safety training that includes spill prevention and containment procedures.
- Labels and MSDS sheets are reviewed before arriving for treatments and are on site during treatments. Information on the labels and MSDS sheets are followed to insure the proper transportation, handling, and loading of the pesticides used.
- Regular maintenance of all application and herbicide transfer equipment is performed to prevent or correct leaks.
- Herbicide containers are tied down or secured when transporting to prevent them from falling from vehicles.

The following containment measures will be taken in the event of a spill

- Applicators will have training in spill response and containment and will follow label and MSDS instructions to insure spill containment and cleanup is done properly and to completion.
- Spill kits will be located on all vehicles which contain an assortment of containment booms and absorbent materials. (Ex: manufacturer recommended materials, pads, mats, sawdust, sand, etc.)
- In the event of a spill the materials from the spill kits will be used to cover and contain the spill area in order to prevent the spill from spreading and to soak up the herbicide. The used absorbent materials would then be cleaned up with brooms and shovels and placed into properly contained drums specifically designated for this use.
- Any spill will be reported as required by State and Federal laws.

### **Measures to ensure that only an appropriate rate of application is used**

A PCA will provide recommendations for the appropriate rate of application based on their review of the treatment area to determine if thresholds have been reached or exceeded. If it is determined that a threshold has been reached and aquatic herbicides or algaecides are the most appropriate method of control, the PCA will provide a written recommendation for control. PCA recommendations include precise rates of application and include potential impacts on the surrounding environment, non-target organisms, and human health.

The PCA written recommendation as well as the licensed applicators will follow product labels to insure applications are performed in accordance with California DPR regulations and guidelines.

### **Education on Potential Adverse Effects from algaecide and aquatic herbicide applications**

Licensed applicators receive annual and project specific training on all potential herbicides being used. The training includes review of the current labels and material safety data sheets which outline the potential adverse effects that can occur from applications with each specific herbicide or algaecide. In addition PCA's, QAL's, and QAC's are required to complete continued education hours every two years to remain licensed with the DPR. The approved continued education courses and seminars educate PCA's, QAL's, and QAC's in a wide variety of topics including pesticide laws, regulations, and pest control methods.

### **Coordination with nearby water users and agencies so that beneficial uses of the water are not impacted during the treatment period**

The City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor will ensure that the lake levels are well below the outflows prior to any application of herbicides and algaecides to prevent any residues from leaving the lakes. However due to the possibility of a structural failure or untimely storm event downstream water users that could potentially be affected by these herbicide and algaecide residues will be notified prior to application.

### **A description of measures that will be used for preventing fish kills**

Herbicide and algaecide applications will be performed at an action threshold that will prevent a significant amount of decomposing algae and plants which can contribute to oxygen depletion and cause fish kills.

Dissolved Oxygen (DO) measurements taken pre-treatment as part of the MRP will be analyzed and if levels are low, partial treatments may be performed at appropriate intervals to limit the

amount of decomposing algae or plants at a given time. Or an alternative method of control will be used if the levels are extremely low.

Aquatic herbicides and algaecides will be applied by licensed applicators that will have specially designed application equipment that is calibrated to insure proper treatment rate and distribution, so that herbicides and algaecides are not highly concentrated in any given area of the treatment plot.

The PCA and licensed applicators will review and follow the current labels and material safety data sheets which outline the potential adverse effects (Potential impacts on fish) that can occur from applications with each specific herbicide or algaecide.

### **ALTERNATIVES TO AQUATIC HERBICIDES AND ALGAECIDES**

The City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor will follow an Integrated Pest Management Program (IPM) to ensure that the pest management strategy concentrates on long term prevention of aquatic pests.

“Integrated Pest Management (IPM) is an effective and environmentally sensitive approach to pest management that relies on a combination of common-sense practices. IPM programs use current, comprehensive information on the life cycles of pests and their interaction with the environment. This information, in combination with available pest control methods, is used to manage pest damage by the most economical means, and with the least possible hazard to people, property, and the environment.” (EPA IPM Principles)

Action threshold levels will be developed so that when pest levels reach a certain growth point, action will be taken to ensure that the beneficial uses of the lakes are not impacted. The City of San Jose Department of Transportation – Special Districts Landscape’s IPM program will insure that all alternative methods will be discussed and if feasible will be implemented in order to minimize the use of herbicides and algaecides in the lake systems. Herbicides and algaecides will be considered if the feasible alternative methods do not provide sufficient control or if herbicides and algaecides are determined to be the most feasible option.

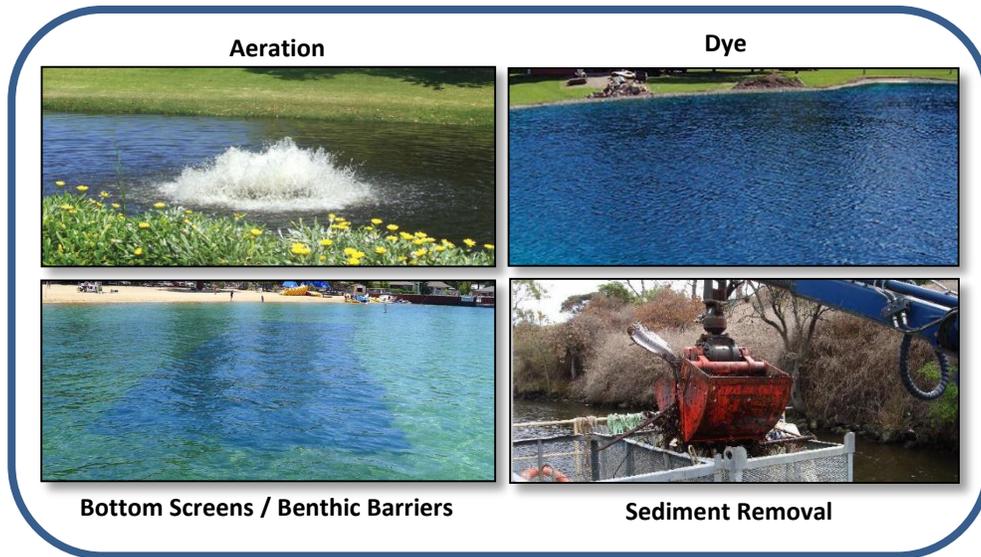
There are situations where herbicides and algaecides may be used before an action threshold is met. One example of this would be when treating early aquatic weed growth with an herbicide that is most effective in controlling the plant species in this early growth stage. This type of treatment can minimize herbicide use by treating small infestations before they spread, thus reducing the amount of herbicide needed if the plants were allowed to reach mature levels.

### **NO ACTION**

There are times when no action may be the most feasible option, and will be the first option discussed in the City of San Jose Department of Transportation – Special Districts Landscape’s IPM Plan. No action can result in the pest species naturally dying back or dissipating before reaching nuisance levels based on water quality parameters and weather conditions. However if

the pest species reaches the action threshold other management and control options will be considered.

## **PREVENTION / CULTURAL METHODS**



### **Early Detection**

Early detection of invasive species by regular monitoring of water bodies can be a very effective preventative measure by removing the invasive(s) before they become established and have sufficient time to spread. Managing early infestations has a significant environmental and economic advantage over managing extensive infestations as much fewer resources such as equipment, herbicide, and manpower are needed.

### **Circulation and Aeration**

Circulation can be used in lagoons to physically mix the water column, and aeration systems can be installed to intersperse the water with surface air. Both of these methods help maintain oxygen levels throughout the water column in order to potentially help reduce algae production by reducing the rate of nutrient recycling into the water.

### **Beneficial Bacteria**

Beneficial bacteria and enzyme solutions can be used to increase the bacterial populations in lakes. This option can be applied to create competition with potential pests, which in theory limits nutrient availability essential for macrophyte and algal growth and reproduction.

## **Dye / Shading**

Aquatic dyes can be used in lagoons to reduce the depths to which light penetrates down into the water column, thus decreasing the availability to aquatic plants and algae which are essential for photosynthesis.

## **Sediment Removal**

Sediment removal can be implemented throughout water bodies to remove nutrient rich sediments from the benthic zone. This is done to reduce the overall nutrient load available for aquatic weeds and algae in the system, as well as maintain desired depths.

## **Bottom Screens / Benthic Barriers**

Bottom screens and benthic barriers can be applied to the sediment like a blanket in water bodies, constricting aquatic plants while blocking out light. There are several materials that have been used as bottom screens with some common materials being plastics and burlap. Benthic barriers have been proven to be successful in controlling aquatic plants but due to high costs are usually only feasible around docks and swimming areas and not for large scale control areas.

A few other disadvantages of benthic barriers are they require regular maintenance and inspection to insure safety and proper performance. If benthic barriers are not regularly maintained sediment can quickly build up on top of the barrier, providing adequate conditions for aquatic weeds to reestablish. If benthic barriers are not properly anchored they can become a hazard for swimmers and boaters. It is also important that recreational and maintenance personnel are aware of barriers that are in place because they can be damaged or displaced from the bottom by activities like fishing, boating, mechanical harvesting and dredging.

The City of San Jose Department of Transportation – Special Districts Landscape currently applies several of the management strategies outlined above such as circulation, aeration, beneficial bacteria, and sediment removal.

## MECHANICAL AND PHYSICAL



### **Mechanical Harvesting**

Mechanical Harvesters are large machines that use cutter bars and conveyor belts to cut and collect aquatic weeds to depths of approximately five to ten feet depending on the size of the harvester. Plants are then transferred or offloaded onto the shore where they can be properly disposed of. Mechanical harvesting is effective in removing aquatic weeds instantaneously and can clear large areas fairly quickly. However mechanical cutting does not provide long term reduction of the plant species, therefore regular maintenance is needed. Due to the regular maintenance required and potential need for hauling and disposal of the cut vegetation this method can become costly. When reviewing the use of mechanical harvesting, it is important to analyze the potential impacts on water quality, fish populations, and the potential to spread invasive plants. There are several species of aquatic plants that can regrow from fragmentation, which can spread and start new infestations.

### **Hand Pulling, Cutting, and Raking**

Cutting, hand pulling, and weed raking can be effective in removing and controlling aquatic plants. This is especially the case in small scale situations such as eliminating early infestations that have not reached levels where other methods would be more cost effective and efficient. The downside to these methods is they are labor intensive, slow, and require regular maintenance which can be costly depending on the size of the infestation and if it is required to haul and dispose of the vegetation offsite.

### **Rotovation**

Rotovation is a method for cutting and disturbing the base and submerged portions of aquatic plants. Rotovation is usually done from a large piece of equipment such as an aquamog or barge

equipped with a hydraulic powered rototilling head that can be lowered to the water body bottom and penetrate up to ten inches into the sediment where it is then activated to cut and destroy the root system. Rotovation is best implemented in large lake and river systems that have adequate access and depths. Rotovation can be an expensive option especially if it is required to remove and dispose of the rotovated vegetation with mechanical harvesters or other equipment. . When reviewing the use of rotovation it is important to analyze the potential impacts on water quality (sediment disturbance could result in unwanted contaminants being released and nutrients that have settled into the sediment can be re-suspended throughout the water column), fish populations, and the potential to spread invasive plants.

### **Excavating**

Excavation can be used to remove emergent, floating and submerged aquatic plants as well as the surface sediment that contains seeds, fragments, rhizomes, stolons, and tubers. This method is frequently used in irrigation canals and water bodies that have openly accessible shorelines. Excavation can be costly especially when it comes to the disposal of the excavated aquatic vegetation and sediment. When reviewing the use of excavation it is important to analyze the potential impacts on water quality (sediment disturbance could result in unwanted contaminants being released and nutrients that have settled into the sediment can be re-suspended throughout the water column), fish populations, and the potential to spread invasive plants.

### **Diver Suction Dredging**

Diver suction dredging is a method that is implemented by using trained divers to use suction dredge pump systems to pull aquatic plants and their root systems from the sediment. The divers use long vacuum hoses with a cutting attachment to detach the vegetation from the sediment and transfer it through the hoses that are attached to the pumps and dredging equipment that is secured to work boats or barges. This equipment is designed to retain the vacuumed vegetation and discharge the sediment and water back into the system. This method has shown to work well for removal of early infestations on invasive weeds and follow up removal following alternative methods for larger infestations. Diver dredging can be an expensive control option as it is a slow process and trained and certified dive teams generally have high prevailing wage and regulation requirements.

The City of San Jose Department of Transportation – Special Districts Landscape does currently use physical methods to remove submerged and floating aquatic weeds from intake screens and skimmer baskets. Mechanical removal such as harvesting is also part of the IPM plan if removal of the plant biomass is the most appropriate method of control.

## **BIOLOGICAL CONTROL METHODS**

Biological control methods are based on selecting and introducing biological organisms such as animals, plants, and insects that have an impact on target plants. The objective of this method is to have the organism reduce the density, growth, reproduction, and overall survival of the target plants. Usually these biological control organisms are found in the native area of where



the aquatic plants originated. Extensive research is done before any biological control agent is allowed or approved to insure that the biological control organisms are host specific and only go after the species of concern.

Due to the plant species in the lakes, regulatory requirements, costs, and the uncertainty of the potential for success, these methods of control are not practical.

### **ALGAECIDES AND AQUATIC HERBICIDES**

If preventative control measures do not hold back nuisance algae blooms or aquatic weed infestations all control methods will be reviewed. City of San Jose Department of Transportation – Special Districts Landscape staff in cooperation with the maintenance contractor PCA will analyze the various



methods and will provide a recommendation that could include any of the methods outlined above or a combination of several of these methods. If it is determined that algaecides and aquatic herbicides are the most feasible option they would be implemented.

The City of San Jose Department of Transportation – Special Districts Landscape has used herbicides and algaecides in the past to control nuisance aquatic weed and algae growth and wants to continue to have them as a tool in their IPM plan.

### **USING THE LEAST INTRUSIVE METHOD OF AQUATIC HERBICIDE APPLICATION**

The City of San Jose Department of Transportation – Special Districts Landscape or contracted applicator and PCA will evaluate each treatment zone to determine the least intrusive method of aquatic herbicide or algaecide treatment. When evaluating which method will be the least intrusive the group will discuss which method will have the least impact on the surrounding environment, non-target organisms, and human health. The trained applicator(s) will also follow the PCA recommendation, pesticide label(s), and safety plan to ensure a successful application.

### **DECISION MATRIX CONCEPT FOR CHOOSING THE MOST APPROPRIATE FORMULATION**

When it comes to deciding what the most appropriate formulation is, the City of San Jose Department of Transportation – Special Districts Landscape or maintenance contractor will rely on the expertise of the PCA to determine the formulation and write a recommendation after reviewing the following:

- Species present in the lake(s)
- Water quality parameters

- Which formulation has the least impact on the surrounding environment, non-target organisms, and human health
- Review of product labels and material safety data sheets

### **AQUATIC HERBICIDE AND ALGAECIDE APPLICATION LOG**

The aquatic herbicide and algaecide application log form on the following page (page 34) was designed based on the following criteria listed in the General Permit.

The Discharger shall maintain a log for each algaecide and aquatic herbicide application. The application log shall contain, at a minimum, the following information:

- Date of application;
- Location of application;
- Name of applicator;
- Type and amount of algaecide and aquatic herbicide used;
- Application details, such as flow and level of water body, time application started and stopped, algaecide and aquatic herbicide application rate and concentration;
- Visual monitoring assessment; and
- Certification that applicator(s) followed the APAP.



NPDES AQUATIC HERBICIDE AND ALGAECIDE APPLICATION LOG FORM

<b>Location of Application:</b>				<b>Weather:</b>			
<b>Applicator(s)</b>				<b>Date of Application:</b>			
<b>Species Controlled:</b>							
<b>Discharge Gates / Control Structures</b>							
Date and time inspected:		Date:		Time:			
Inspection Performed By: Notes:							
Date and Time Opened		Date:		Time:			
Date and Time Closed		Date:		Time:			
<b>Applicator Certification:</b> I [ _____ ] certify that the Aquatic Pesticide Application Plan has been followed Signature: _____ Date: _____							
<b>Application Start Time:</b>				<b>Application Stop Time:</b>			
<b>Application details: ( surface acres treated, flow, level of water body, depth, type and amount of algaecide and aquatic herbicide used, application rate, concentration )</b>							
Treatment Area	Acres treated (Surface Acres)	Water level / Flow	Depth (Average depth of treatment area)	Herbicide or Algaecide Used	Amount	Application Rate	Concentration
<b>Visual Monitoring assessment – See NPDES Monitoring Data Form</b>							



## **REFERENCES**

**The below references were used as guidelines when developing this Aquatic Pesticide Application Plan.**

**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**

[http://www.waterboards.ca.gov/board\\_decisions/adopted\\_orders/water\\_quality/2013/wqo2013\\_0002dwq.pdf](http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2013/wqo2013_0002dwq.pdf)

**EPA Standard Operating Procedure: Surface Water Sampling PDF**

<http://www2.epa.gov/region8/standard-operating-procedure-surface-water-sampling>

**Wisconsin Department of Natural Resources Chemical Fact Sheets**

<http://dnr.wi.gov/lakes/plants/factsheets/>

**United States Environmental Protection Agency Integrated Pest Management (IPM) Principles**

<http://www.epa.gov/opp00001/factsheets/ipm.htm>

**Clearwater Hydrology - Draft Lake Water Quality Assessment Report**

<http://clearwater-hydrology.com/>