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FEB 27 2014
DIVISION OF WATER QUALITY

Attachment E – Notice of Intent

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. Change of Information: WDID# 6B36P100101
C. ☐ Change of ownership or responsibility: WDID#

II. DISCHARGER INFORMATION

A. Name Arrowhead Lake Association			
B. Mailing Address P.O.Box 1119			
C. City Lake Arrowhead	D. County San Bernardino	E. State CA	F. Zip 92352
G. Contact Person Jim Grant	H. E-mail address jgrant@ala-ca.org	I. Title General Manager	J. Phone 909-337-2595 ext. 111

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

A. Name same			
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: Lake Arrowhead and Grass Valley 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 Region 6B
(List all regions where algaecide and aquatic herbicide application is proposed.)

V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION

A. Target Organisms: ____

Eurasian water milfoil; widgeon grass; elodea; Illinois pondweed; cattail; bulrush

B. Algaecide and Aquatic Herbicide Used: List Name and Active ingredients

Sonar-Fluridone
Renovate-Triclopyr
Clearcast-Imazamox
AquaPro-Glyphosate
Littora-Diquat
Aquathol-Endothall
Galleon-Penoxsulam
PAK 27-sodium carbonate peroxyhydrate

C. Period of Application: Start Date 5-1-14 End Date 4-30-18 or life of permit

D. Types of Adjuvants Used: non-ionic surfactants approved for aquatic use

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: JAMES L. GRANT

B. Signature: _____ **Date:** FEBRUARY 27, 2014

C. Title: GENERAL MANAGER

XI. FOR STATE WATER BOARD STAFF USE ONLY

WDID:	**Date NOI Received:**	**Date NOI Processed:**
Case Handler's Initial:	**Fee Amount Received:** **$**	**Check #:**
☐ **Lyris List Notification of Posting of APAP**	**Date** _____	**Confirmation Sent** _____


Arrowhead Lake Association
Aquatic Pesticide Application Plan (APAP)

for coverage under

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

Prepared For:
Arrowhead Lake Association
P.O.Box 1119
Lake Arrowhead, California 92352

Prepared By:
AquaTechnex, LLC
P.O.Box 4193
Palm Desert, CA 92261

CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direct supervision in accordance with a system designed to insure that qualified personnel properly gathered and evaluated 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".

Signed and Agreed,

X_____
Jim Grant, Acting General Manager,
Arrowhead Lake Association

X_____
Ian Cormican, Regional Manager AquaTechnex, LLC

Contents

Introduction

Lakes and river systems throughout the United States are impacted with excessive growth of aquatic weeds and algae. Excessive aquatic plant growth can have a severe impact on the beneficial uses of a water body and its ecology. There are a number of technologies that lake managers use to control problematic growth of these species. U.S. EPA registered aquatic herbicides are one such option.

Aquatic herbicide applications are regulated by the Environmental Protection Agency in a number of ways. Companies that registered these products have to clear strict protocols that the EPA has in place to insure their use will not have unintended impacts on the environment. Once registered, the EPA label on the product is the law. The directions contained on the label insure that the product is applied correctly and that no unintended impacts occur. In addition, these materials must, in most cases, be applied by licensed aquatic applicators. The EPA delegates licensing authority to the states and applicators must demonstrate competence and understanding in order to become licensed and continue their education in order to maintain these licenses and remain in the forefront of their field.

The US Court System has added additional requirements to the application of aquatic herbicides. Court cases have established that, in many cases, a National Pollutant Discharge Elimination System (NPDES) permit is required to comply with the Clean Water Act

The Statewide General NPDES Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications (herein referred to as the "Permit") was adopted on March 5, 2013 and will become available on December 1, 2013 (SWRCB 2013). The Permit requires compliance with the following:

- The Policy for Implementation ofToxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries in California, a.k.a. the State Implementation Plan, or SIP (SWRCB 2000)
- The California Toxics Rule (CTR)
- Applicable Regional Water Quality Control Board (RWQCB) Basin Plan Water Quality Objectives (WQOs) (CVRWQCB 2003)

The Permit does not cover indirect or non-point source discharges whether from agricultural or other applications of pesticides to land, that may be conveyed in storm water or irrigation runoff. The Permit only covers algaecides and aquatic herbicides that are applied according to label directions and that are registered for use on aquatic sites by the California Department of Pesticide Regulation (DPR).

One of the requirements of Water Quality Order No. 2013-0002-DWQ is to develop and follow an Aquatic Pesticide Application Plan (APAP). This document contains a response to all required components of the APAP as outlined in the Water Quality Order for the application of aquatic herbicides and algaecides to Lake Arrowhead, CA.

This APAP is being provided by the Arrowhead Lake Association (ALA)in order to regulate pesticide applications to Lake Arrowhead and Grass Valley Lake. This APAP is a comprehensive plan developed for ALA that describes the project, the need for the project, what will be done to reduce water quality impacts, and how those impacts will be monitored. Specifically, this APAP contains the following eleven elements.

1. Description of the water system to which algaecides and aquatic herbicides are being applied;

2. Description of the treatment area in the water system

3. Description of types of weed(s) and algae that are being controlled and why;

4. Algaecide and aquatic herbicide products or types of algaecides and aquatic herbicides expected to be used and if known their degradation byproducts, the method in which they are applied, and if applicable,the adjuvants and surfactants used;

5. Discussion of the factors influencing the decision to select algaecide and aquatic herbicide applications for algae and weed control;

6. If applicable, list the gates or control structures to be used to control the extent of receiving waters potentially affected by algaecide and aquatic herbicide application and provide an inspection schedule of those gates or control structures to ensure they are not leaking;

7. If the Discharger has 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 (Policy) section 5.3 from meeting acrolein and copper receiving water limitations, provide the beginning and ending dates of the exception period, and justification for the needed time for the exception. If algaecide and aquatic herbicide applications occur outside of the exception period, describe plans to ensure that receiving water criteria are not exceeded because the Dischargers must comply with the acrolein and copper receiving water limitations for all applications that occur outside of the exception period;

8. Description of monitoring program;

9. Description of procedures used to prevent sample contamination from persons, equipment, and vehicles associated with algaecide and aquatic herbicide application;

10. Description of the Best Management Practices (BMPs to be implemented. The BMPs shall include, at the minimum:

    a. Measures to prevent algaecide and aquatic herbicide spill and for spill containment during the event of a spill;

    b. Measures to ensure that only an appropriate rate of application consistent with product label requirements Is applied for the targeted weeds or algae;

    c. The Discharger's plan in educating its staff and algaecide and aquatic herbicide applicators on how to avoid any potential adverse effects from the algaecide and aquatic herbicide applications;

    d. Discussion on planning and coordination with nearby farmers and agencies with water rights diversion so that beneficial uses of the water (irrigation, drinking water supply,

domestic stock water, etc.) are not impacted during the treatment period; and

e. A description of measures that will be used for preventing fish kill when algaecides and aquatic herbicides will be used for algae and aquatic weed controls.

11. Examination of Possible Alternatives. Dischargers should examine the alternatives to algaecide and aquatic herbicide use to reduce the need for applying algaecides and herbicides. Such methods include:

    a. Evaluating the following management options, in which the impact to water quality, impact to non-target organisms including plants, algaecide and aquatic herbicide resistance, feasibility, and cost effectiveness should be considered:

        i. No action;

        ii. Prevention;

        iii. Mechanical or physical methods;

        iv. Cultural methods;

        v. Biological control agents; and

        vi. Algaecides and aquatic herbicides;

        If there are no alternatives to algaecides and aquatic herbicides, Dischargers shall use the minimum amount of algaecides and aquatic herbicides that is necessary to have an effective control program and is consistent with the algaecide and aquatic herbicide product label requirements.

    b. Using the least intrusive method of algaecide and aquatic herbicide application; and

    c. Applying a decision matrix concept to the choice of the most appropriate formulation

Element 1: Description of the water systems to which aquatic algaecides and herbicides are being applied

Lake Arrowhead

Lake Arrowhead is an artificial lake with a surface area of approximately 767acres and a capacity of 48,000 acre feet. It is located in San Bernardino County, California adjacent to the unincorporated town of Lake Arrowhead. The lake was created with the original intent of serving as part of a major water works project to provide irrigation water to farmers in the San Bernardino Valley below the mountain location. The construction of the dam that impounds the lake was begun in 1904. In 1922, the Arrowhead Lake Company completed the project with the objective of developing the area into a mountain lake resort.

The lake is currently managed by ALA, whose focus is to provide recreational use and enjoyment to its members, families and guests. ALA owns and operates a number of beaches that can be used by members. They operate a lake patrol to insure the safety of boaters using the lake. They also regulate shoreline docks and access to the lake.

The lake is also a source of potable water for the community. The Lake Arrowhead Community Services District withdraws water from the lake and following treatment distributes it to the local residents. ALA works in concert with the Community Services District in regard to water quality and aquatic plant management issues.

Grass Valley Lake

Grass Valley Lake is located in the San Bernardino Mountains of southern California, and is a 13 acre reservoir, with an approximate volume of 130 acre feet. Grass Valley Lake is a catchment basin for a 1500 square acre watershed, and is fed by runoff from snow pack in the spring. The primary uses for the lake are as an irrigation source for a nearby golf course during the spring time snow melt; as a supplemental water source for Lake Arrowhead; and as an addition to the Mojave River watershed.

The lake was created as an impoundment of Grass Valley Creek in the early 1900's for water storage and use for the surrounding communities. In 1908 a tunnel was built to direct flow from Grass Valley Lake into nearby Lake Arrowhead, to become part of the potable water supply of the community. In 1957 an earthen dam was built to increase storage capacity, and this was replaced by a concrete dam in 1965. The outflow from the spillway at the north end of the lake feeds Deep Creek and runs down into the Mojave River. Upon completion of the new dam in 1965, water use rights for the lake were divided between the Mojave River County Water District, now called the Mojave Water Agency, and the Lake Arrowhead Development Company, which was a predecessor of the ALA . It was agreed that 800 acre feet of water per year could be diverted to Lake Arrowhead, and a gate structure was built and flow meters installed in order to prevent excess flow into Lake Arrowhead beyond the agreed upon annual volume. The lake is currently managed by ALA and has a community park along the western shore.

The lake serves as an irrigation reservoir for Lake Arrowhead Country Club in the spring, but is not used for irrigation during the summer season, as the golf course switches to a reclaimed water source. The golf course is located adjacent to the lake and streams that feed it, and has implemented BMP's to offset the potential runoff from course management activities, fertilization, growth regulation, weed control, etc., into the lake. The golf course utilizes a 50 foot setback from the lake edge, and maintains a vegetative barrier between the turf and the water's edge.

Grass Valley Lake is a supplemental water source to Lake Arrowhead, thus it is considered to be a potable water reservoir in the early spring. Thus, ALA works in concert with the Community Services District in regard to water quality and aquatic plant management issues.

Element 2: Description of the treatment area in the water system

Lake Arrowhead

Lake Arrowhead has a predominantly steep shoreline, intermixed with several shallow bays and inlets. The lake shore is densely populated with dock systems, thus the treatment areas for Lake Arrowhead are selected specifically to address navigation issues. There are approximately 18 acres that are designated as

treatment zone (see Appendix A maps).
Grass Valley Lake

Grass Valley Lake has a shallow sloping shoreline and an average depth of 12'. This creates a littoral zone that allows for aquatic plant growth to impact much of the water column. Approximately 30% of the shoreline is ringed by emergent vegetation, predominantly cattails and bulrush. There are approximately 12.7 acres that are designated as treatment zone (see Appendix A maps).

Element 3: Description of aquatic weed problem

The primary aquatic weed problem present in both Lake Arrowhead and Grass Valley Lake is the noxious invasive aquatic weed *Myriophyllum spicatum* or Eurasian Water Milfoil. Survey and mapping projects completed by the ALA in recent years show that Eurasian Milfoil dominates the littoral area of each lake. There are minor concentrations of native aquatic plants present, but their growth is largely suppressed by the invasive milfoil community. In some areas, however, these plants may reach nuisance levels that impede navigation and impact beneficial uses. These native plants are widgeon grass (*ruppia maratima)*; common elodea (*elodea Canadensis)*; Illinois pondweed (*potamogeton illinoensis)*; water smartweed (*polygonum amphibium lapathifolium*); common cattail (*Typha latifolia);* and hardstem bulrush (*Scirpus acutus.*

Eurasian Water milfoil (*myriophyllum spicatum)*

Eurasian Milfoil is not native to North America. This plant is a noxious perennial with rhizomes and finely dissected whorled submersed leaves that develops colonies that form subsurface and surface mats. Mats impede water flow, interfere with boat traffic and recreational activities, create mosquito habitat, and displace native aquatic vegetation. It is c*urrently listed on the federal Noxious Weeds list as an invasive species.* Eurasian Water milfoil inhabits a wide range of environmental conditions, but generally favors hard alkaline water up to 3m deep. Under the right conditions, it can grow in 8m or more of water. Milfoil reproduces vegitatively by rhizomes, stem fragments, and axillary buds. Stem fragments disperse with water by clinging to the feet or feathers of water birds, and with human activities such as boating, mechanical harvesting, and the dumping of unwanted pond or aquarium contents. Eurasian Water milfoil can also reproduce by seeds, which typically have a prolonged dormancy period. Seeds can survive at least 7 years under dry conditions, and typically germinate around 10°C (approx. 50°F).

Eurasian Milfoil spreads when plant fragments are transported by currents within a water body as well as being carried from lake to lake on boats or boat trailers.

Widgeon Grass (*ruppia maratima)*:

Widgeon grass is a submersed aquatic perennial with linear leaves and rhizomes. Widgeon grass is a widespread native with a nearly worldwide distribution. It is a valuable food and habitat plant for wildlife and is not considered a weed in most natural areas. However, it can be weedy in shallow areas and controlled aquatic systems. It flowers from April-August, and foliage will die off in cooler temperatures, but the rhizomes will remain to germinate when temperatures are suitable. It reproduces vegitatively from rhizomes and from stem fragments, and by seed.

Common Elodea (*elodea Canadensis)*:

Common elodea is a genetically variable and highly plastic depending on environmental conditions. Stems typically grow rooted in the substrate but fragment easily into free floating pieces that root at nodes. Common elodea is native to North America, where it is an important component of natural aquatic ecosystems. Populations are rarely troublesome in natural environments, and it is a good habitat for fish and aquatic invertebrates. Plants can become dominant in altered or created aquatic systems, especially when bicarbonate, reduced iron and phosphorous are plentiful. Common elodea flowers June-October and reproduces by turions and root nodes, as well as seed (although infrequent).

Illinois Pondweed (*potamogeton illinoensis)*:

Illinois pondweed is part of the potamogeton genus, which is comprised of many widespread, highly variable species. It is a perennial with submersed leaves and a rhizome root structure. Potamogetons such as Illinois pondweed are widespread native**s** of North America, and are an important food source for wildlife. They provide good habitat and cover for aquatic species and waterfowl, and are considered beneficial in balanced population density. Illinois pondweed flowers from May-September and senesce or go dormant in the winter months.

Water Smartweed (*polygonum amphibium lapathifolium*):

Smartweed species are a coarse emergent aquatic and sometimes terrestrial plant. Swamp Smartweed is a widespread native of North America that typically grows in or on the edges of ponds, marshes, lakes and streams, and areas subject to seasonal flooding or periodic standing water. In natural areas it is a desirable component of the flora, as it provides an important food source for many species of waterfowl and mammals. Foliage also provides cover for wildlife. This species is a colonizing perennial with creeping rhizomes and erect spreading stems 1.5 meters tall. These plants flower from June through October, and mature plants have a 5-lobed pink flower 4-6mm long. These plants reproduce from rhizomes, fragmented stems, and seeds. They generally grow in 1-5 meters of water, and population density can be reduced through manual and mechanical removal.

Common Cattail (*Typha latifolia)*

Common cattail is a coarse emergent perennial plant that grows from 5 to15 feet tall. Plants typically develop dense colonies in shallow water up to 3-4 feet of depth, but are sometimes terrestrial on muddy shorelines. Common cattail is a widespread native of Eurasia, North Africa, and North America. In natural areas it is not generally considered a weed, and the plants help to prevent erosion of shorelines, help remove excess quantities of nutrients from water, and are a valuable source of food and habitat for wildlife. However, common cattail can become problematic in controlled aquatic systems. Common cattail usually flowers from May-August and can reproduce by seed but is primarily spread vegitatively from rhizomes, which are dense tubular root structures beneath the sediment.

Hardstem bulrush (*Scirpus acutus)*

Hardstem bulrush, also known as great bulrush, or common tule, is an erect rush-like perennial that can grow up to 15 feet tall in the right conditions. Hardstem bulrush is a widespread native of North America, that is sometimes weedy in irrigation and drainage ditches, rice fields, and controlled aquatic systems. Like cattails and soft rush, hardstem bulrush spreads reproductively through seeds and vegitatively through rhizomes. It flowers May-August and seed germination typically occurs during spring/summer.

Element 4: Algaecides and aquatic herbicide s expected to be used

Hebicide/Algaecide	Application Method	Adjuvant
Fluridone	drop hose boom system	None
Diquat	drop hose boom system	None
glyphosate	spray nozzle, backpack sprayer	Non-ionic/approved for aquatic
Endothall	drop hose boom system	None
Penoxsulam	drop hose boom system	None
Imazamox	Spray nozzle, backpack sprayer	Non-ionic/approved for aquatic
Sodium carbonate peroxyhydrate	eductor/spray jets	None
Triclopyr	eductor/spray jets	None

Element 5: Discussion of factors influencing the decision to select algaecide and aquatic herbicide applications for algae and weed control

The decision to use aquatic algaecides and herbicides was originally proposed by ALA as part of an Integrated Pest Management (IPM) approach. One of the primary operational goals of the IPM approach is to establish a general and reasonable set of control measures that not only aid in managing aquatic vegetation populations, but also address public health & safety, economic, legal, and aesthetic requirements. The IPM approach is based on the determination of nuisance thresholds of plants and algae determined by the Agency. If vegetation or algae equals or exceeds a threshold, a control method is implemented. Control methods may include mechanical, physical, biological, or chemical strategies. Algaecide and aquatic herbicide use may or may not be employed as a last resort control method, and is considered a critical part of the IPM program. For some aquatic weed varieties, herbicides offer the most effective (i.e. long-lasting or least labor Intensive) control, and often they may be the only control available.

Control tolerances are based on a number of factors. Beneficial uses and the impact of the weed and algae growth on those uses is a primary determining factor when using integrated aquatic plant management technologies to control this growth.

Eurasian Water milfoil

Eurasian Milfoil is a non native invasive aquatic weed. In their report on invasive aquatic species, the U.S. Congress Office of Technology categorized this plant as a "harmful non-indigenous species". Milfoil can grow up to one foot per week and reach the lake surface from depths of up to 25 feet. It forms dense mats that clog the lake surface. This growth shades out native aquatic plants that do not grow as fast. These native plants subsequently die off and are replaced. This leads to a monoculture of the invasive weed replacing a diverse native aquatic plant community. Impacting the species of plants present can alter habitat critical to other aquatic life leading to further degradation of species diversity. The dense weed mats alter water quality. Dissolved oxygen levels are normally severely depressed, water temperatures are warmed beyond levels many fish species can tolerate and pH levels are altered.

Eurasian milfoil also impacts beneficial uses of infested lake and river systems, and can negatively impact reservoirs that are a potable water supply. Heavy infestations of Eurasian Milfoil have been shown to

cause taste and odor problems in delivered water. The EPA has set standards for taste and odor and these standards can be jeopardized by the presences of this noxious weed. Eurasian Milfoil beds pose a threat to swimmers. There are a number of examples each year where drowning deaths are directly attributed to the presence of this noxious aquatic weed.

In the case of a native plant such as spiral ditch grass, common elodea, Illinois pondweed, water smartweed, cattails, and bulrush; nuisance conditions only arise when plant growth impedes navigation in shallow inlets and bays, or prevents shoreline access to the lake. The primary factor impacting tolerance is that in shallow areas that are are 100% littoral zone, the entire lake bottom is subject to sunlight exposure, and thus the entire water volume will be overcome by the biomass of the plants should they be allowed to grow unchecked. This causes navigation issues; creates visual nuisances (swampy appearance, algae); causes a decline in water quality due to increased temperature and pH; and has a negative impact on the fishery in that too much plant density alters the forage capability and success rate of the predator fish, and thus diminishes their growth rate and spawn.. Effective control methods that are within practical means and provide an effective result must be considered in order to mitigate the impact of control efforts on the lakes.

The decision to us an algaecide or herbicide is based on consultation with the controlling agency and in coordination with a certified Pest Control Advisor (PCA). This decision takes into consideration any other viable control options that may work in combination with algaecides and herbicides, and is focused on the most effective technology to achieve control with as little environmental impact as possible.

Element 6: Gates and control structures

Lake Arrowhead

There are generally no water discharges from Arrowhead Lake during the period when aquatic herbicides would be applied to these waters. The ALA however has complete control of these structures at the spillway. All treatments will be coordinated with ALA and steps will be taken to insure that control structures are secure and closed during treatment events. The application team will evaluate weather conditions in the forecast for the period the herbicides are expected to remain active in the water column and if conditions are such that a storm event might require discharge, the treatment will be postponed. Potable water intakes are shut down during treatment duration, and all treatments observe label recommended setbacks from these intakes.

Grass Valley Lake

There are generally no water discharges from Grass Valley Lake during the period when aquatic herbicides would be applied to these waters. Water delivery from Grass Valley Lake to Lake Arrowhead occurs as part of the snow melt in the early spring. There is a valve and gate structure in place on the conveyance channel to Lake Arrowhead, and ALA has control of these structures. All treatments will be coordinated with ALA and steps will be taken to insure that control structures are secure and closed during treatment events.

Element 7: Short term or seasonal section 5.3 exception

ALA does not require and has not been granted an section 5.3 exception.

Element 8: Description of monitoring program

The first step undertaken each year this plan is in effect will be to conduct a survey of the littoral area of the lake. This survey will confirm the presence and density of various aquatic plant communities.

This data will be reviewed with ALA to determine where aquatic weed growth is having an impact and effect on beneficial uses of the water body. When those areas are outlined, the Pest Control Advisor will review them and develop treatment recommendations.

Attachment C of the Permit presents the Monitoring and Reporting Program (MRP). The MRP addresses two key questions:

1**:** Does the residual algaecides and aquatic herbicides discharge cause an exceedance of the receiving water limitations?

2: Does the discharge of residual algaecides and aquatic herbicides, including active ingredients, inert ingredients, and degradation byproducts, in any combination cause or contribute to an exceedance of the "no toxics in toxic amount" narrative toxicity objective?

RECIVING WATER LIMITATIONS

Constituent/ Parameter	BENEFICIAL USE[1]				Basis
	MUN, µg/L	WARM or COLD, µg/L	Other than MUN, WARM, or COLD, µg/L	All Designations	
2,4,-D	70				U.S. EPA MCL
Acrolein[2]	320	21	780		U.S. EPA Water Quality Criteria, 1986.
Copper[2]				Dissolved Freshwater[3] Copper Chronic = 0.960exp{0.8545 [ln(hardness[4])] – 1.702}[5, 6] Dissolved saltwater[3] Copper Chronic = 0.83exp{0.8545	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 this receiving water limitation during the exception period described in Section VIII.C.10, Limitations and Discharge Requirements, Aquatic Pesticides Application Plan (APAP).

Records of Monitoring will include (See Attachment C-Monitoring Forms):

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

Data Collection

Visual monitoring will be performed for all algaecide and aquatic herbicide applications at all sites and be recorded by qualified personnel on standardized forms that will centralized and made available for review upon request.

Monitoring Locations and Frequency

No water quality sampling is required for applications of products that contain sodium carbonate peroxyhydrate. For application of all other algaecides and aquatic herbicides listed on the Permit, the Controlling Agnecy will collect samples from a minimum of six application events for each active ingredient in each environmental setting per year. If there are less than six application events in a year for an active ingredient, the Controlling Agency will collect samples for each application event in each environmental setting.

If the results from six consecutive sampling events show concentrations that are less than the applicable receiving water limitation/trigger in an environmental setting, then sampling frequency for that active ingredient will be reduced to one per year in that environmental setting. If the annual sampling shows exceedances of the applicable receiving water limitation/trigger, the Agency will be required to return to sampling six applications the next year, and until sampling may be reduced again.

In-situ Measurements

In conjunction with sample collection, temperature will be measured in the field. Turbidity, electrical conductivity, pH, and dissolved oxygen may be measured in the field using field meters: Turbidity, pH, and dissolved oxygen meters are calibrated according to manufacturer's specifications at the recommended frequency, and checked with a standard prior to each use.

The table below indicates the required monitoring parameters as per Permit:

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]	ºF	Grab[4]	[5]	Background, Event and Post-event Monitoring	[6]
	2. pH[3]	Number				
	3. Turbidity[3]	NTU				
	4. Electric Conductivity[3] @ 25°C	µmhos/cm				
Chemical	1. Active Ingredient[7]	µg/L	Grab[4]	[5]	Background, Event and Post-event Monitoring	[6]
	2. Nonylphenol[8]	µg/L				
	3. Hardness (if copper is monitored)	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.

Sample Locations

Sampling will include background, event, and post-event monitoring as follows:

Background Monitoring: The background sample is collected in the treatment area within 24 hours prior to the start of the application.

Event Monitoring: The event sample is collected outside the treatment area immediately after the application event, but after sufficient time has elapsed such that treated water would have exited the treatment area.

Post-Event Monitoring: The post-event monitoring sample is collected within the treatment area within one week after the application.

One full set of three samples (i.e., BG, Event and Post) will be collected during each treatment from the representative site(s) treated.

Monitoring Records: Records of monitoring events will include the following information:

a. The date, exact place, and time of sampling or measurements;
b. The individuals who perforn1ed the sampling or measurements;
c. The date's analyses were performed;
d. The individuals who performed the analyses;
e. The analytical techniques or method used; and
f. The results of such analyses.

Sampling Methods and Guidelines

The purpose of this section is to present methods and guidelines for the collection and analysis of samples necessary to meet the APAP objective of assessing adverse impacts, if any, to beneficial uses of water bodies treated with algaecides and aquatic herbicides.

This section describes the techniques, equipment, and methods for sample collection and analysis.

Sample Collection

If the water depth is 6 feet or greater the sample will be collected at a depth of 3 feet. If the water depth is less than 6 feet the sample will be collected at the approximate mid-depth. The sampling container will be inverted before being lowered into the water to the desired sample depth, where it will be turned upright to collect the sample.

During collection, the samples will be collected in a manner that minimizes the amount of suspended sediment and debris in the sample. Surface water grab samples will be collected directly by the sample container or by intermediary container in the event that the sample container cannot be adequately or safely used.

To ensure data quality control, each container will be affixed with a label indicating a sample number for each sample location. The label will also indicate the date and time of sampling and the sampler's name.

Field Sampling Procedures

A logbook will be maintained for each sampling site. The log book will indicate sampling times, locations, observations and field monitoring results for parameters collected with field equipment and not requiring laboratory analysis

As per Permit, field observations will note: floating or suspended matter; discoloration; bottom deposits; aquatic life; visible sheens or coatings; potential nuisance conditions.

Sampling Equipment Cleaning

Upon completion of the sampling event, the equipment will be thoroughly cleaned with and tripled rinsed with distilled water, and then rinsed once with the water being sampled prior to its first use at a new sampling location.

Sample Preservation

If necessary, samples will be collected with bottles containing the correct preservative(s), refrigerated at four (4) degrees Celsius (C), stored in a dark place, and transported to the analytical laboratory within a suitable time frame so as to insure compliance with required hold times for specific constituents.

Sample Packing and Shipping

All samples will be packed and transported the day they are collected in order to observed required holding times for lab samples. Ice will be included in coolers containing samples that require temperature control, and sample will be packaged in the following manner:

- Each sampling container will have an identifying label
- A chain of custody form will be completed with the required date, time, location, sample collector, and required analysis
- Samples requiring shipment will be properly packed with protective padding and secured for express delivery or courier pick up

Sample Preservation and Transportation

If preservation is required for the monitored constituent, the preservative will be placed in the sample container by the container vendor prior to sample collection. Once a

sample is collected and labeled It will immediately be placed in a dark, cold (-4° C) environment, typically a cooler with ice. Delivery to the laboratory should occur on the same day or the next day as the sample collection

Chain-of-Custody (COC)

A COC form will be completed for each sampling event, and the form will accompany the samples to the laboratory. COC forms will indicate time, date, location of sampling, sampler name, and analyses required. A copy of the COC will be retained upon delivery of samples to the lab.

Field Sampling Kit

Each field sampling kit will contain the following equipment:
•Appropriate sampling container as provided by certified lab
•COC's
•Field collection forms
•Sample i.d. labels
•Deionized water
•Cooler or ice chest
•Ice packs
•Sub surface sampler
•Non powdered plastic or nitrile gloves
•GPS for sampling location collection
•Plastic storage bags for samples and or paperwork

Laboratory Quality Assurance and Quality Control

All laboratory analyses will be conducted by a state certified laboratory as per Permit specification. Laboratory precision and accuracy will be monitored by a series of laboratory-generated quality control samples. As long as sufficient sample volume is collected and submitted to the laboratory, no additional effort is required by field activities to generate laboratory quality control samples. Each set of field samples will have associated with it one each from the following set of laboratory quality control samples.

Reporting Procedures

An annual report for each reporting period, from January 1to December 31will be prepared by March 1 of the following year and will be submitted to the appropriate RWQCB. In years when no algaecides or aquatic herbicides are used, a letter stating no applications will be sent to the appropriate RWQCB in lieu of an annual report.

The annual report will contain the following information as described in Attachment C of the Permit:

1. An Executive Summary discussing compliance or violation of the Permit and the effectiveness of the APAP;and

2. A summary of monitoring data, Including the identification of water quality improvements or degradation as a result of algaecide or aquatic herbicide application

The Discharger will collect and retain all information on the previous reporting year. When requested by the Deputy Director or Executive Officer of the applicable RWQCB, the ALA will submit the annual information collected, including:

1. An Executive Summary discussing compliance or violation of the Permit and the effectiveness of the APAP to reduce or prevent the discharge of pollutants associated with herbicide applications;

2. A summary of monitoring data, including the identification of water quality improvements or degradation as a result of algaecide or aquatic herbicide application, if appropriate, and recommendations for improvement to the APAP (including proposed BMPs) and monitoring program based on the monitoring results. All receiving water monitoring data shall be compared to applicable receiving water limitations and receiving water monitoring triggers;

3. Identification of BMPs and a discussion of their effectiveness in meeting the Permit requirements;

4. A discussion of BMP modifications addressing violations of the Permit;

5. A map showing the location of each treatment area;

6. Types and amounts of aquatic herbicides used at each application event during each application

7. Information on surface area and/or volume of treatment area and any other information used to calculate dosage, concentration, and quantity of each 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 Aquatic Herbicide Application Logs

The results of sampling and analysis will be summarized in the Annual Report. The data will be tabulated so that they are readily discernible.

24 Hour Report and Five Day Reporting :

The discharger and or applicator will orally report any non-compliance. This includes any unexpected or unintended effect of the use of an algaecide or aquatic herbicide that may danger health or the environment. This information will be provided orally within 24 hours from the time the discharger or applicator becomes aware o the circumstances. A written report of the non-compliance will be provided within five (5) days of the time the discharger and or applicator becomes aware of the

noncompliance. The 24 hour report as well as the 5 day written report will follow the format in Attachment C.

Element 9: Procedures to Prevent Sample Contamination

Personnel that are making algaecide and aquatic herbicide applications will not be allowed to collect samples.

Sample collection personnel will not be allowed to handle or come into contact with algaecide or aquatic pesticide application equipment, containers or personal protective equipment (PPE) used by applicators. Care will be taken by samplers to minimize into contact with any treated water or vegetation.

In the event that sampling equipment will be used in more than one location, the equipment will be triple-rinsed uncontaminated water, and then rinsed once with the water being sampled prior to its first use at a new sample collection location. Gloves will be changed between sites.

Element 10: Description of BMPs

The Controlling Agency has established the following Best Management Practices (BMP) in order to assure that all aquatic pesticides are used in a safe and efficient manner

Measures to Prevent Spills and Spill Containment in the Event of a Spill

Applicators take care when mixing and loading algaecides and aquatic herbicides and adjuvants. All label language is followed to ensure safe handling and loading of algaecides and aquatic herbicides. Application equipment is regularly checked and maintained to identify and minimize the likelihood of leaks developing or failure that would lead to a spill.

If algaecides or aquatic herbicides are spilled, they will be prevented from entering any waterbodies to the extent practicable. Applicator staff are trained in the use of absorbent materials such as kitty litter, "pigs" and "pillows". Spills will be cleaned up according to label instructions, and all equipment used to *remove* spills will be properly contained and disposed of or decontaminated, as appropriate. Applicators will report spills as required and in a manner consistent with local, state and federal requirements.

Measures to Ensure Appropriate Use Rate

The following BMPs help to ensure that the appropriate pesticide application rate is used.

<u>Site Scouting</u>

Prior to the treatment, qualified staff will scout sites to determine where nuisance thresholds have been exceeded. These thresholds are based on the agreed upon standard and maintenance of the beneficial uses of the lake.

If a location is deemed to have exceeded a threshold, or given algae or aquatic weed population is anticipated to exceed a threshold based on site and weather conditions, historic aquatic weed growth, or other information, an algaecide or aquatic herbicide application is considered. If the application can be made without negatively impacting the water quality, then an application is made.

Applications Made According to Label

All algaecide and aquatic herbicide applications are made in accordance with the Federal Insecticide Fungicide and Rodenticide Act (FIFRA) and in accordance with the regulations of the EPA, CA EPA, CADPR, and local Agricultural Commissioner.

Applications Made by Qualified Applicator Certificate Holders

Applicators with QALs, QACs or properly trained staff under the supervision of applicators with QALs or QACs make applications or supervise applications. These staff have knowledge of proper equipment loading, nozzle selection, calibration, and operation so that spills are minimized, precise application rates are made according to the label, and only target plants are treated.

The Discharger's plan in educating its staff and herbicide applicators on how to avoid any potential adverse effects from the herbicide applications

All Discharger's application staff hold QALs from CA DPR and are trained annually in the safe handling, mixing, application, storage, and transport of all aquatic herbicides and algaecides that are used. In addition to this, staff are briefed as to site specific conditions including water volume, use restrictions, environmental constraints, flow conditions, pest identification, and nuisance thresholds. All application staff are familiar with label instructions and conditions in regard to the safe and legal handling, mixing, and application of aquatic herbicides and algaecides in their control. Training materials and procedures are updated every 6-12 months or as required depending upon the use of different active ingredients, compounds, or the addition of new treatment sites. All QALs require 20 continuing education units every two years in order to stay current on new application methods and requirements.

Planning and coordination with water users in order to minimize impacts during application

As required by the algaecide and aquatic herbicide label, water users potentially affected by any water use restrictions will be notified prior to an application being made. As necessary, gates, weirs, etc. will be closed as necessary to prevent discharge of residual algaecide or aquatic herbicides to off target locations.

Description of Measures to Prevent Fish Kills

Applications Made According to Label

Precautions on the product label to prevent fish kills will be followed. For example, limitations on the surface water area treated will be followed to prevent dead algae or aquatic weeds from accumulating and then decaying and subsequently depressing the dissolved oxygen (DO) level.

Applications Made by Qualified Applicator Certificate Holders

Holders of QACs, QALs, or those under their direct supervision make applications recommended by the PCA. These applicators have knowledge of proper equipment loading, nozzle selection, calibration, and operation so that spills are minimized, precise application rates are made according to the label, and only target algae or vegetation are treated. Calibration ensures that the correct quantity and rate of herbicide is applied.

Element 11: Examination of Possible Alternatives

Evaluation of Management Options

When developing an aquatic vegetation management program, all applicable aquatic plant management technologies should be considered along with their limitations and applicability to the situation experienced in the lake. An Integrated Pest Management (IPM) approach is developed with this principle in mind.

Aquatic plant management technologies are broadly categorized within the following framework:

- No action
- Prevention
- Mechanical or physical methods
- Cultural methods
- Biological control agents
- Algaecides and aquatic herbicides

No Action

Whenever possible, this is the preferred BMP. The "less is more" approach is optimal in regard to caos as well as environmental impact. If pre-determined nuisance levels have not been reached, than this may be a feasible approach.

Prevention i.e Biological and Cultural Methods

This approach focuses on altering the environmental conditions in such a way as to modify the habitat in order to prevent nuisance aquatic weeds and algae. Methods such as aeration, light attenuating dyes, dredging, or bio-manipulation have all had positive results in regard to reduction of the growth rate of algae and aquatic plants. Aeration, oxygenation and mixing are methods that can mechanically add oxygen directly to the water, and can result in the reduction of nuisance algae growth. Shading the water column using non-toxic, inert dyes can reduce unwanted submerged plants and algae. Use of dyes works on algae and submerged vegetation by limiting their ability to photosynthesize when the dye is present, but is not a long-term solution.

Bio-manipulation utilizes various natural mechanisms that can reduce suspended algae, and involves increasing biological controls in the habitat. Outcomes from this type of management approach can be unpredictable and often don't address the immediate nuisance.

Another preventative method is the use of bottom barrier or benthic blanket technologies. Bottom barriers are materials that come in sheets and are negatively buoyant. They can be attached to the bottom and rolled over the top of existing plants beds, they are then weighted or pinned to the lake bottom. These systems provide immediate and long term control of all aquatic vegetation where they are placed. The drawbacks are generally the high costs of materials. These barriers cost from $0.75 to $1.00 per square foot installed. At this rate they can be cost effective for small application such as along a dock line or private swim beach, but the per acre cost is calculated using the 43,560 square feet in a acre. In addition, barriers can trap gases between the lake sediment and the barrier causing them to lift into propellers or create areas that might be a threat to swimmers diving under the water line. Regular maintenance and inspections are required.

Mechanical or Physical Methods

Mechanical Removal

There are two primary mechanical control technologies available to managers.

Aquatic weed harvesting systems can cut and remove aquatic vegetation from the lake. These systems are barges with cutting knives around a conveyor belt that harvest the plants, and move them onto the barge where a second conveyor belt collects and off loads the vegetation. These systems cut generally to a depth of five feet. Aquatic plants will then go through a short period of recovery and then begin to grow again.

Harvesting operations are efficient when the plants can be accessed without interference of obstructions such as docks and boat houses, and when the shore side operations for transfer and removal of the vegetation can be located close to where the harvester is working. The more time the harvester has to spend transporting weeds to the shore-side operation, the lower the production of the harvester.

Harvesting systems have some drawbacks in this circumstance, as there is limited shoreline accessibility and no launch access for vessels this size. In addition, these systems do not capture all of the fragments created by the cutting operation, leading to propagation through that method.

Rotovation systems used underwater tilling systems to cut the widgeon grass roots from the lake sediment. This can provide somewhat longer term control of this species. Rotovation however dislodges a considerable amount of plant material that has to be captured.

Environmental impacts due to the use of mechanical techniques include the creation of water-borne sediment and turbidity due to people and equipment working in the water. This suspended sediment can adversely affect aquatic species by lowering dissolved oxygen and preventing light penetration. Disturbing sediment or conveyance banks may cause additional problems including, but not limited to, new areas for aquatic weed establishment, fragmentation and re-establishment of aquatic weeds, and siltation

Physical Methods

Diver hand removal can be a very effective method of controlling spiral ditch grass and other aquatic plants under certain conditions. Divers swim through the littoral area of the lake, note and often map the

locations of stands of weeds, and hand remove and bag the plant material and roots. This system is effective in waters where visibility is good. The method provides rapid removal and clears the plants from the water column. One of the drawbacks of this method is the expense of deploying divers. Many states require prevailing wages for this activity that can cost upwards of $100.00 per hour for a dive team. For safety purposes, at least two divers must be working together underwater with a tender/safety diver on the support boat monitoring these operations.

Diver dredging is also used in this type of application. Using this technology dive teams use a hose system to pump the vegetation to a barge where it is captured for removal from the lake. While this system is more productive than diver hand removal, the same potential drawbacks apply.

Algaecides and Aquatic Herbicides

The selection of and decision to use an algaecide or aquatic herbicide is based on the recommendation of a PCA. The PCA considers a variety of control options that may include mechanical and cultural techniques that alone or in combination with chemical controls are the most efficacious and protective of the environment. Several factors are taken into consideration in this process; expense, efficacy, expediency, and environmental impact to name a few. In general, alternative control techniques are expensive, labor intensive, not as effective, and cause temporary water quality degradation.

The quantity of algaecide and aquatic herbicide required for an application is determined by a PCA that has followed the label directions in making a recommendation. The rate at which an algaecide and aquatic herbicide is used is highly variable and depends on the type, time of year, location, and density and type of aquatic weeds, water presence, and goal of the application. All these factors are considered by the PCA prior to making a recommendation for an application.

Using the Least Intrusive Method of Aquatic Herbicide Application

Discharger staff will use application techniques so as to apply aquatic herbicides and algaecides in the least intrusive manner, and in order insure rapid and accurate delivery to the treatment site. Algaecides and herbicides that are selected are chosen for the maximum efficacy at the lowest suitable amount, and for minimal impact on the lake during application.

Applying a decision matrix concept to the choice of the most appropriate formulation

When selecting the appropriate formulation for aquatic weed and algae control, several factors must be taken into consideration. The Discharger consults with ALA as well as a licensed PCA, and all of the environmental factors are taken into consideration. The components of this decision matrix are as follows:

- Accurate identification of pest
- Established nuisance threshold and tolerances \
- External influences such as flow, water volume, and water use restrictions
- Method of application
- Duration of application
- Mitigation of treatment effects on lake ecology

•Ability to apply BMPs affectively

All of these factors are involved in the selection of a control method in order to maintain plant and algae growth below nuisance thresholds, and to protect the beneficial uses of the lake.

END OF APAP

REFERENCES

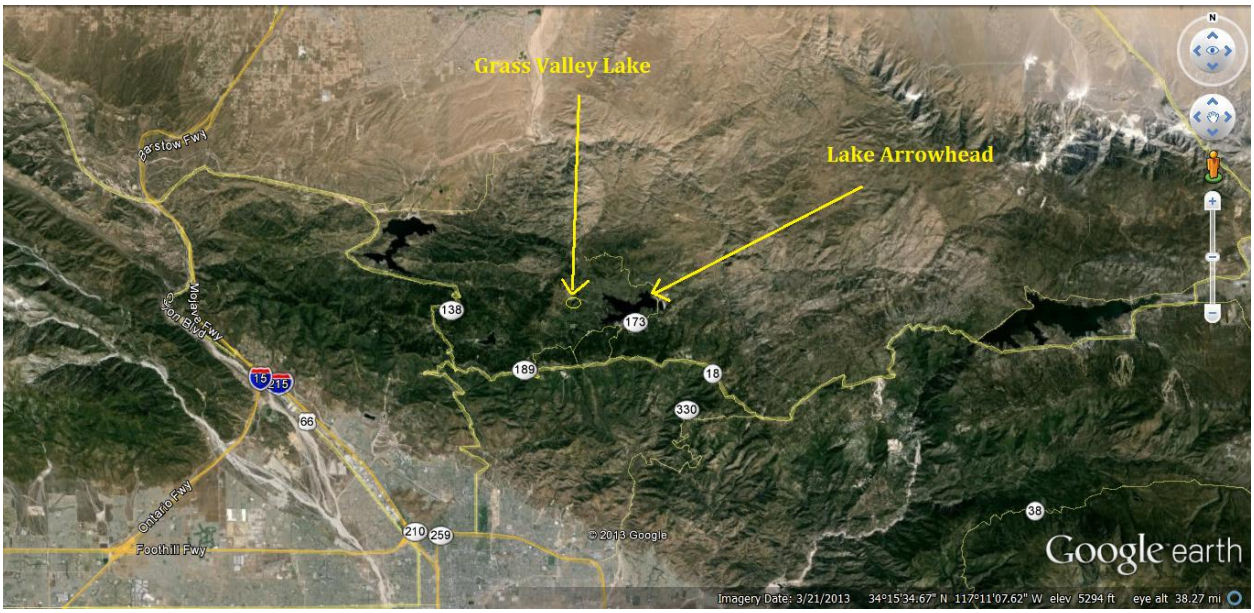
SWRCB. 2013. Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications, Water Quality Order No. 2013-0002-DWQ.

APPENDIX A

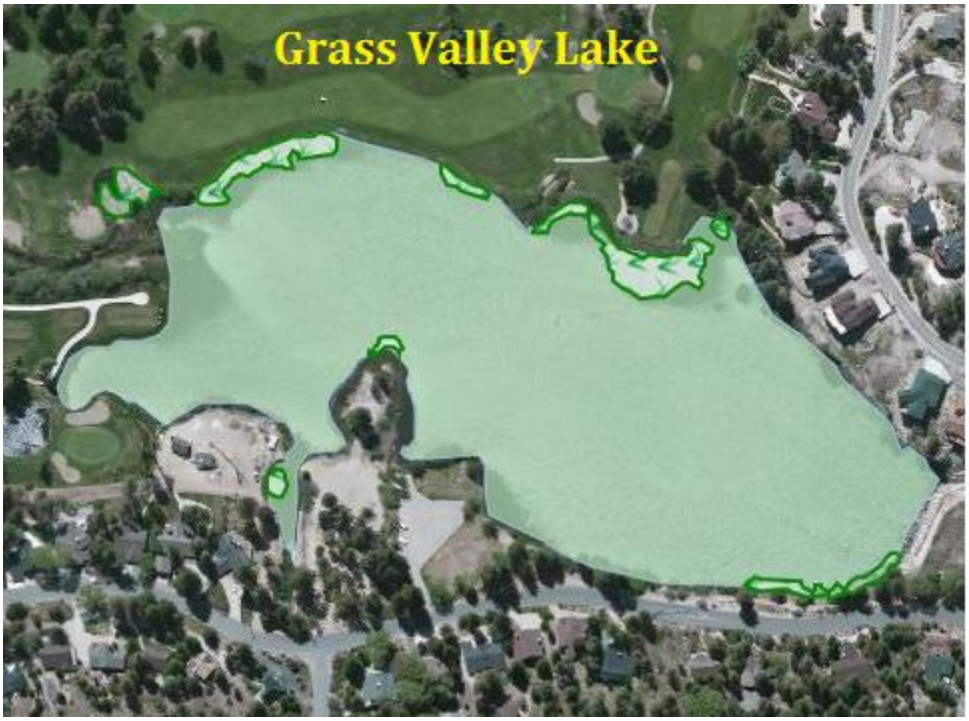
VICINITY MAP

TREATMENT MAP

Vicinity Map



Treatment Area Maps



APPENDIX B

PESTICIDE APPLICATION LOG

RECEIVING WATER MONITORING FORMS

AquaTechnex
"Advancing the Science of Lake Management"

P.O. Box 4193
Palm Desert, CA 92261
Tel: 760-272-5842

www.aquatechnex.com

AQUATIC PESTICDE APPLICATION LOG

Date of Application:		**APPLICATION AREA**	
Location:		**Surface area**	
ApplictionStart Time:		**Volume**	
Application End Time:		**TREATMENT AREA**	
Applicator Name:		**Surface area**	
		Volume	

Discharge Gates or Control Structures	****Attach a map showing application area, treatment area, immediately adjacent untreated area, and other informatio used to calculate dosage and quantity of each pesticide at each application site**
Name	
Date Closed	
Time Closed	
Date Opened	
Time Opened	

Calculations to Determine Opening and Closures: _____

Dosage and Quantity Information for Each Pesticide Used

Application Details

Plot #	Area	Depth	Product	Quantity	Rate	

APAP CERTIFICATION

I, _____ **(print name) certify that the APAP has been followed**

sign here X _____

AquaTechnex

"Advancing the Science of Lake Management"

NPDES RECEIVING WATER VISUAL OBSERVATION FORM

Background Monitoring Parameters

(u/s or at treatment area up to 24 hours or at time of treatment)

Monitoring Date		**Location**				
Sampled By						
Monitoring Area Description (pond,waterway, channel…)						
Site Conditions/Appearance of Waterway		**present**	**absent**	**Visible films, sheens, or coatings:**	**present**	**absent**
Floating or suspended matter:				**Fungi, slimes, objectionable growths;**		
Disocloration:				**Potential nuisance conditions:**		
Bottom deposits:						
Aquatic life:						
Weather Conditions/observations:						

Event Monitoring Parameters

(immediately adjacent to treatment area after application)

Monitoring Date		**Location**				
Sampled By						
Monitoring Area Description (pond,waterway, channel…)						
Site Conditions/Appearance of Waterway		**present**	**absent**	**Visible films, sheens, or coatings:**	**present**	**absent**
Floating or suspended matter:				**Fungi, slimes, objectionable growths;**		
Disocloration:				**Potential nuisance conditions:**		
Bottom deposits:						
Aquatic life:						
Weather Conditions/observations:						

Post Event Monitoring Parameters

(collected in the treatment area within one week post application)

Monitoring Date		**Location**				
Sampled By						
Monitoring Area Description (pond,waterway, channel…)						
Site Conditions/Appearance of Waterway		**present**	**absent**	**Visible films, sheens, or coatings:**	**present**	**absent**
Floating or suspended matter:				**Fungi, slimes, objectionable growths;**		
Disocloration:				**Potential nuisance conditions:**		
Bottom deposits:						
Aquatic life:						
Weather Conditions/observations:						

AquaTechnex

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RECEIVING WATER MONITORING FORM PHYSICAL AND CHEMICAL

Location:		**Date:**			
Sampled by:					
Background Monitoring Parameters (u/s or at treatment area up to 24 hours or at time of treatment)					
Physical Sample (3ft below surface or mid depth if <3ft)	**Temperature²(°F)**	**pH²(number)**	**Turbidity² (NTU)**	**Electrical Conductivity²(µmhos/cm)**	
Chemical Sample (3 feet below surface or mid depth if <3ft)	**Active Ingredient (µg/L)**	**Nonylphenol (µg/L)³**	**Hardness ($CaCO_3$)⁴**	**DissolvedOxygen(mg/L)²**	
GPS latitude and longitude coordinates:					
Location:		**Date:**			
Sampled by:					
Event Monitoring Parameters (immediately adjacent to treatment area after application)					
Physical Sample (3ft below surface or mid depth if <3ft)	**Temperature²(°F)**	**pH²(number)**	**Turbidity² (NTU)**	**Electrical Conductivity²(µmhos/cm)**	
Chemical Sample (3 feet below surface or mid depth if <3ft)	**Active Ingredient (µg/L)**	**Nonylphenol (µg/L)³**	**Hardness ($CaCO_3$)⁴**	**DissolvedOxygen(mg/L)²**	
GPS latitude and longitude coordinates:					
Location:		**Date:**			
Sampled by:					
Post Event Monitoring Parameters (within treatment area within one week after application)					
Physical Sample (3ft below surface or mid depth if <3ft)	**Temperature²(°F)**	**pH²(number)**	**Turbidity² (NTU)**	**Electrical Conductivity²(µmhos/cm)**	
Chemical Sample (3 feet below surface or mid depth if <3ft)	**Active Ingredient (µg/L)**	**Nonylphenol (µg/L)³**	**Hardness ($CaCO_3$)⁴**	**DissolvedOxygen(mg/L)²**	
GPS latitude and longitude coordinates:					