Attachment E – Notice of Intent

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

SEP 03 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

I. NOTICE OF INTENT STATUS (see Instructions)

Mark only one item	A. New Applicator	B. Change of Information: WDID# 1B05140NSON
	C. ☐ Change of ownership or responsibility: WDID#	

II. DISCHARGER INFORMATION

A. Name CITY OF SANTA ROSA - RECREATION AND PARKS DEPARTMENT			
B. Mailing Address 55 STONY POINT ROAD			
C. City SANTA ROSA	D. County SONOMA	E. State CA	F. Zip 95401
G. Contact Person LISA GRANT	H. E-mail address lgrant@srcity.org	I. Title PARK SUPERINTENDENT	J. Phone 707-543-3774

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: NIELSEN POND, FOUNTAINGROVE LAKE, LAKE RALPHINE

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

V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION

A. Target Organisms: MOSQUITO FERN - AZOLLA SPP., WATER MILFOIL - MYRIOPHYLLUM SPP., PLANKTONIC AND FLOATING FILAMENTOUS ALGAE, DUCKWEED - LEMNA SPP, BULRUSH - SCIRPUS SPP, CATTAIL - TYPHA SPP. OTHER TARGET ORGANISMS THAT MAY BE DETRIMENTAL TO THE BENEFICIAL USES OF THE WATER BODIES

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

SONAR — FLURIDONE
REWARD - DIQUAT DIBROMIDE
PAK 27 - SODIUM CARBONATE PEROXYHYDRATE
CLEAN GREEN LIQUID - HYDROGEN DIOXIDE
HABITAT - IMAZAPYR
AQUAMASTER - GLYPHOSATE
RENOVATE - TRICLOPYR
AQUATHOL K - DIPOTASSIUM SALT OF ENDOTHAL
HYDROTHOL 191 - DIMETHYLALKYAMINE SALT OF ENDOTHALL
CLEARCAST - AMMONIUM SALT OF IMAZAMOX
GALLEON SC - PENOXSULAM

C. Period of Application: Start Date APRIL 1 End Date OCTOBER 31

D. Types of Adjuvants Used: NONYLPHENOL, D-LIMONENE

VI. AQUATIC PESTICIDE APPLICATION PLAN

Has an Aquatic Pesticide Application Plan been prepared and is the applicator familiar with its contents?
☑ 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: Danette L Smejkal

B. Signature: Danette L Smejkal **Date:** 8/28/13

C. Title: Recreation + Parks Director

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** _____

City of Santa Rosa
Recreation and Parks Department
Aquatic Pesticide Application Plan

Aquatic Pesticide General NPDES Permit
Water Quality Order No.-2013-0002-DWQ

August
2013

City of Santa Rosa
Recreation and Parks Department
Aquatic Pesticide Application Plan
Aquatic Pesticides General NPDES Permit
Water Quality Order No. 20013-0002-DWQ
August 2013

INTRODUCTION

On March 5, 2013, the State Water Resources Control Board adopted 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 (permit). The permit requires that dischargers seeking permit coverage submit an Aquatic Pesticides Application Plan (APAP) with the permit application package to the State Water Resources Control Board (Reference: Section II.C.3. *Permit Coverage and Application Requirements, General Permit Application).* When the application package and the APAP are deemed complete, the Deputy Director of the Water Board will issue a Notice of Applicability allowing the discharger to apply aquatic pesticides in accordance with the requirements of the permit.

An APAP describes a discharger's methods and procedures to: determine the need for pesticide use; evaluate and use pesticide alternatives when practical; identify the appropriate pesticide, application method and formulation; assess treatment effectiveness; and monitor and document compliance with the permit requirements. Through these methods and procedures the APAP provides the discharger direction to ensure that pesticide applications to waters of the United States are in compliance with permit. The specific contents of the APAP are found in the permit's Section VIII.C. *(Aquatic Pesticide Use Requirements, Aquatic Pesticides Application Plan).*

Changes that occur in methods, procedures and materials during the permit term will require changes in the APAP. Major changes to the APAP (e.g., change in pesticide materials, changes in pesticide application rates, changes to Best Management Practices, etc.) will be submitted to the Deputy Director of the State Water Resources Control Board for review and approval as required by the permit. The following is the Aquatic Pesticide Application Plan of the City of Santa Rosa recreation and Parks Department.

DESCRIPTION OF THE WATER BODIES COVERED UNDER THIS PERMIT

The City of Santa Rosa owns and maintains three bodies of water; Lake Ralphine, Fountaingrove Lake and Nielsen Pond. Beneficial uses of these water bodies include flood control, wildlife habitat and recreation. All water bodies discharge to the waters of the United States and are located within the Russian River watershed.

Lake Ralphine – This lake covers approximately 25 surface acres and is approximately 25 feet at its deepest point. The lake is fed by storm water and overflow from Spring Lake (County of Sonoma)

located just upstream. Recreational uses include fishing and boating. Nuisance growth of the submerged weed Eurasian watermilfoil impacts the beneficial uses of the lake.

Fountaingrove Lake – Also covering 25 surface acres, Fountaingrove Lake is approximately 28 feet at its deepest. Co-owned with the Fountaingrove Golf and Athletic Club, it is fed by storm water. Recreational uses include fishing and boating. Nuisance growth includes cattails and bulrush along the shoreline including both dams and spillway. The California Division of Safety of Dams has required control of this vegetation for safety. The Marin Sonoma Mosquito Abatement and Vector Control District has raised concerns about the dense growth of both cattails and bulrush hampering their ability to control mosquitos.

Nielsen Pond - Located in Frances Nielsen Park, it is approximately 1.74 surface acres and 16 feet deep. It was designed to be part of the City's storm drain system and is fed by storm water. Beneficial uses include wildlife habitat, fishing and the aesthetic enjoyment for the residential subdivision in which the park is located. Nuisance vegetation includes floating and emergent aquatic vegetation.

TREATMENT AREA DESCRIPTION

Water Body	Target Organism	Treatment Area
Lake Ralphine	Eurasian watermilfoil	Entire lake
Fountaingrove Lake	Cattail, bulrush	Area containing the vegetation
Nielsen Pond	Azolla, duckweed, other floating vegetation	Entire lake
	Cattail, bulrush	Area containing the vegetation
	Floating filamentous and planktonic algae	Area containing the vegetation

VEGETATION SUBJECT TO CONTROL

The weeds and algae subject to control are as follows:

Emergent weeds are Cattails (Typhus spp.) and bulrush (Scirpus spp.) which are problematic at both Fountaingrove Lake and Nielsen Pond. At both locations this vegetation prevents shoreline access, difficulties with mosquito control, concerns of blockage to outfall structures and at Fountaingrove Lake requests by the California Division of Safety of Dams to remove and control these weeds along the impound structures. Mechanical control is supplemented with aquatic herbicides.

The floating vegetation Mosquito fern (Azolla spp.) and duckweed (Lemna spp.) has fully covered the surface of Nielsen Pond on previous occasions. These weeds interfere with aesthetic enjoyment of the pond and produce objectionable odors as they die and decompose. An aeration system has been installed to help with water quality.

The submerged weed Eurasian watermilfoil (Myriophyllum spicatum) are found in both Lake Ralphine and Fountaingrove Lake. This weed has historically only been problematic in Lake Ralphine but have the potential to became a problem in Fountaingrove Lake. The watermilfoil in Lake Ralphine impacts the planting of hatchery trout. Vehicle access to the lake is limited and the trout are released close to shore. The milfoil interferes with their ability to reach open water. Its dense growth hinders fishing, makes it difficult to navigate paddleboats and hampers efforts to rescue boaters in distress. Mechanical harvesting of milfoil was performed in Lake Ralphine during the midsummer approximately 25 years ago. Due to large boulders on the bottom of the lake, the harvester cutting head could not be lowered significantly and control was less than three weeks.

Floating filamentous and planktonic algae have periodically become problems at both Lake Ralphine and Nielsen Pond. These algae interfere with the aesthetic enjoyment of both bodies of water.

ALGAECIDES, HERBICIDES AND ADJUVANTS USED

Pesticide (active ingredient)	Degradation Byproducts	Application Method
Habitat (isopropylamine salt of Imazapyr)	None	Boom Hand spot treat
AquaMaster, AquaStar, various (Glyphosate)	None	Boom Hand spot treat
Renovate (Triclopyr)	None	Boom
Reward (Diquat dibromide)	None	Hand spot treat
Aquathol K (Dipotassium salt of endothall)	None	Drip Hand spot treat
Hydrothol 191 (Mono(N,N dimethylalkyamine salt of endothall))	None	Drip Hand spot treat
Sonar formulations (Fluidone)	n-methyl formamide (NMF) and 3-trifluoromethyl benzoic acid	Boom Hand spot treat
Green Clean Liquid (Hydrogen dioxide)	None	Hand spot treat
Clearcast (Ammonium salt of imazomox)	None	Boom Hand spot treat
Galleon SC (Penoxsulam)	None	Boom
PAK 27 (Sodium carbonate peroxyhydrate)	None	Spreader
Adjuvants		
Cygnet Plus		
Agridex		
Competitor		
Liberate		

FACTORS INFLUENCING PESTICIDE USE

The decision to use aquatic algaecides and herbicides is based on; visual inspection of the pest species and its developmental stage, history of the pest species, water levels, short and long term weather forecasts, geology, topography, regulatory requirements (California Division of Safety of Dams at Lake Fountaingrove) and tolerance. Alternative control methods are always considered when practical. This is discussed in more detail under section titled, EXAMINATION OF POSSIBLE ALTERNATIVES.

CONTROL STRUCTURES AND INSPECTION SCHEDULE

Both lakes and the pond are man-made with impoundment structures. The single dam at Lake Ralphine and the two dams at Fountaingrove Lake impound water of sufficient volume to be regulated by the California Division of Safety of Dams. All three dams are inspected annually by the state at which time the valves are exercised. These valves are exercised quarterly. Additionally, both lakes have overflow spillways. Nielsen Pond has both an overflow pipe and a spillway. All are inspected both prior to the onset of winter rains (prior to the spillways or pipe running) and after flow has ceased, generally late spring. The table below identifies the structures, their location and inspection frequency at each site.

Site	Structure	Location	Frequency
Lake Ralphine	Spillway	North end of dam	Bi-annually
	Drain valve #1	Lake	Quarterly
	Drain valve #2	Base of dam	
Fountaingrove Lake	Spillway	West end of dam#1	Bi-annually
	Drain valve #1	Lake	Quarterly
	Drain valve #2	Base of dam	
	Drain valve #3	15 feet west of #2	
Nielsen Pond	Spillway	West end of pond	Bi-annually

MONITORING AND REPORTING PROGRAM

The City of Santa Rosa is required to implement a Monitoring and Reporting Program (MRP) that conforms to the requirements described in Attachment C of the permit. This is outlined below;

Geographic and Hydrographic Features: As described earlier, the lakes and pond that make up the City of Santa Rosa's system consist of man-made impoundments. All are located in the rocky hills on the north and eastern edges of the city and sit at least 100 feet above the flat areas of the city. All three water bodies are dammed portions of creeks – Spring Creek (Lake Ralphine), Piner Creek (Fountaingrove Lake) and Russell Creek (Nielsen Pond). All serve as flood control structures.

Application Practices: Application practices in the lakes and pond involve dispersal of pesticide across the treatment area by boat or from the shore. Algaecides and aquatic herbicides can be broadcast on the surface or below the surface with the use of weighted hoses. In both instances the application area can represent a significant portion of the ultimate treatment area.

Transport, Fate and Effects: Transport of residues is governed by hydraulics, weather conditions and dispersion. It would be expected that transport occurs primarily through mixing and dispersion. The fate of the active ingredient for each pesticide varies, but is expected to have non-significant impacts. Sodium Carbonate Peroxyhdrate rapidly breaks down into hydrogen pyroxide and sodium carbonate. The hydrogen peroxide oxidizes the target pest and then breaks down into water and oxygen. The half-life in water of Glyphosate is 35-63 days. However, Glyphosate quickly adsorbs to soil particles and is eventually broken down through microbial degradation. Fluridone photo-degrades and has a half-life of 20 days in water. It also rapidly adsorbs to soil particles. The relatively short-lived presence of these compounds minimizes the potential effects.

Beneficial Uses: The lakes and pond are flood control systems that provide fish and waterfowl habitat. Additionally, they provide for recreational and aesthetic enjoyment. Treatment applications would, in large part, improve these beneficial uses.

Cumulative and Indirect Effects: Because of the relatively short duration these active ingredients would be bioavailable, it would not be expected there would be any cumulative or indirect effects.

Mechanism for Impacts to Designated Beneficial Uses: Applying pesticides at rates in excess of what is necessary to provide control of a target organism can impact beneficial uses by increasing concentrations. Likewise, applying aquatic pesticides at rates below those stated on a product label may lead to poor control and, potentially the need for subsequent treatment.

The failure to implement administrative controls can lead to unwanted consequences for other designated beneficial uses downstream. Failure to inform users in advance of treatment activities could impact the use of the waters for municipal and/or agricultural water supply. The potential for impacts to actual receiving waters of the United States is small as treatments would normally be scheduled when lake/pond outfall events would be highly unlikely.

Potential Impacts: The active ingredients of concern are; fluridone and glyphosate. Fluoridone and Glyphosate have instantaneous maximum concentrations associated with USEPA Integrated Risk Information System and Maximum Contaminant Level criteria respectively. Additionally, Fluridone can potentially impact the beneficial use of agricultural irrigation if present in water used for agricultural irrigation (e.g. grape crops). Other potential impacts are impacts to receiving waters at concentrations that exceed the limits shown below:

Active Ingredient	Instantaneous Maximum
Fluridone	560 µg/L
Glyphosate	700 µg/L

Potential impacts for glyphosate are toxicity to aquatic life. Glyphosate achieves a stable state in sediment and then biodegrades. The half-live of glyphosate is short and should not persist in the water column. Therefore, the risk is minimal if label instructions are followed. Fluridone persists for a longer

period of time but applications would be timed such that it would not be expected to be transported outside the treatment area.

Sampling Locations: Sampling points for each of the bodies of water have been identified which will provide sufficient coverage of the potential treatment areas. There will be two sampling points per application; one within the treatment area and the other adjacent to the treatment area. The three types of samples will be collected for each treatment as described in the table below:

Sample Type	Time of Collection	Sampling Location
Background	Up to 24 hours prior to the treatment event	Anywhere within the area which is to be treated
Event	Immediately following the treatment event after sufficient time has elapsed to allow treated water to exit treatment area	Immediately outside of the treatment area
Post-Event	Within one week after application	Within the area that was treated

Sampling Methods and Schedule: The Monitoring and Reporting Program will be implemented through the following tasks:

- **Determination of monitoring locations:** Sampling locations will be determined for each application based on hydrology, access, operations, and potential for downstream impacts.
- **Sample collection equipment and container preparation:** Prior to each sampling event, the necessary equipment and collection containers will be prepared. Equipment will be properly calibrated.
- **Training:** All personnel will be trained in proper sample collection techniques and chain of custody practices.
- **Sample collection and transport:** Samples will be collected in the field, preserved and then transported or shipped to a contract laboratory.
- **Sample analysis and reporting:** Samples will be analyzed by the laboratory. Results will be reported to the Park Superintendent.
- **Evaluation.** Once results are available, any results exceeding receiving water limitations will be immediately noted and reports made to the SWRCB as required.
- **Modification of Treatment Application practices.** Application practices and methods will be adjusted as necessary, guided by the results of sampling.

Monitoring: Will be as outlined in the table below:

Sample Type	Constituent/Parameter	Units	Sample Method	Minimum Sampling Frequency	Sample Type Requirement	Required Analytical Test Method
Visual	1. Monitoring area description (pond, lake, open waterway, channel, etc.) 2. Appearance of waterway (sheen, color, clarity, etc.) 3. Weather conditions (fog, rain, wind, etc.)	Not applicable	Visual Observation	1	Background, Event and Post-event Monitoring	Not applicable
Physical	1. Temperature[2]	°F	Grab[4]	5	Background, Event and Post-event Monitoring	6
	2. pH[3]	Number				
	3. Turbidity[3]	NTU				
	4. Elec. 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)	µg/L				
	4. Dissolved Oxygen[2]	µg/L				

1. All applications at all sites.
2. Field testing.
3. Field or laboratory testing.
4. Samples shall be collected at three feet below the surface of the water body or at mid water column depth if the depth is less than three feet.
5. Collect samples from a minimum of six application events for each active ingredient in each environmental setting (flowing water and non- flowing water) per year, except for glyphosate. If there are less than six application events in a year, collect samples during each application event for each active ingredient in each environmental setting (flowing water and non-flowing water). If the results from six consecutive sampling events show concentrations that are less than the receiving water limitation/trigger for an active ingredient in an environmental setting, sampling shall be reduced to one application event per year for that active ingredient in that environmental setting. If the yearly sampling event shows exceedance of the receiving water limitation/trigger for an active ingredient in an environmental setting, then sampling shall return to six application events for that active ingredient in each environmental setting. For glyphosate, collect samples from one application event from each environmental setting (flowing water and non-flowing water) per year.
6. Pollutants shall be analyzed using the analytical methods described in 40 C.F.R. part 136.
7. 2,4-D, acrolein, dissolved copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, and triclopyr.
8. It is required only when a surfactant is used.

Monitoring Records: Will include for each application:

- Date, time and location of samples collected.
- Name(s) of individuals who conducted the treatment.
- Date(s) of laboratory analysis.
- Individuals who performed the analyses.
- Analytical techniques or methods used.
- Results.

Additionally, a log of water conditions in the treatment area will be maintained that records observations from the visual assessment that include:

- Floating or suspended matter.
- Discoloration.

- Bottom deposits.
- Aquatic life.
- Visible films, sheens, or coatings.
- Fungi, slimes, or objectionable growths.
- Potential nuisance conditions.

Laboratory Certification and Procedures: Laboratory Analyses will be conducted by a contract laboratory that maintains an Environmental Laboratory Accreditation Program (ELAP) certification from the California Department of Public Health. Analyses will be conducted consistent with the most current edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants", which is found in 40 C.F.R. Part 136. Equivalent methods approved by the State Water Board and Regional Water Boards may also be used, if necessary.

Annual Reporting: The City will submit an Annual Report that covers the period January 1 through December 1 for each year to the State Water Board and the North Coast Regional Water Board. The report will be submitted by March 1 of the following year. The Annual Report will adhere to the requirements described in Attachment C of the Permit.

24 Hour Report and Five Day Reporting: The City will orally report any non-compliance, including any unexpected or unintended effect of an algaecide or aquatic herbicide use that may endanger health or the environment, within 24 hours to the State Board and the North Coast Regional Water Board from the time that it becomes aware of the circumstances. 24 hour report will be followed up by a written report within 5 days of the time that the City becomes aware of the non-compliance.

Procedures to Prevent Contamination: Personnel responsible for sample collection shall be trained in proper collection methods and procedures to avoid contamination and ensure representative samples are taken. Sample equipment and containers shall be kept separate from pesticide containers and application equipment. Samples will be tracked using standard chain of custody protocols to ensure integrity of the sample collection and transfer process.

BEST MANAGEMENT PRACTICES

Best Management Practices (BMPs) are utilized with the handling and use of aquatic pesticides. These aquatic pesticide BMPs are in place to prevent and mitigate releases, ensure the proper use, and prevent unintended consequences to the environment. A select few of these BMPs are discussed below.

Measures to Prevent and Mitigate Aquatic Pesticide Spills: All aquatic pesticides and pesticide applications are conducted by licensed pest control applicators. Applicators are trained annually in the proper handling and safe use of pesticides. This ensures that the mixing and application activities are conducted in ways that minimize accidental spills and overexposure to both the employee and the environment. The training has specific procedures for the loading and handling of pesticides in the field to prevent accidental spillage during transfer, staging, and setup activities.

In the event of an accidental release, pest control vehicles and pesticide storage areas are equipped with appropriate spill supplies.

Measures to Ensure an Appropriate Pesticide Application Rate: All pesticide use must be reviewed, recommended, and prescribed for applications by a Licensed Pesticide Control Advisor (PCA). The PCA provides direction as to; the treatment area, the appropriate amount of pesticide to be used during treatment activities as well as other criteria and/or restrictions to be observed with specific aquatic pesticides or with specific sites. All personnel applying pesticides possess, at minimum, a Qualified Applicator Certificate.

Staff Education on Potential Adverse Effects: Each year before the use of each pesticide, the PCA and the pesticide applicators will review the label of each aquatic pesticide. These labels describe the potential environmental hazards associated with the use of the pesticide, and the measures that should be taken to avoid the adverse effects.

Measures to Prevent Fish Kill: Fish populate all three water bodies. Lake Ralphine is routinely stocked with fish for recreational fishing. Because fish can be harmed during the application of copper, the City of Santa Rosa does not use copper based pesticides. To prevent a fish kill in the lakes, the practice is to treat no more than half a reservoir body at any one time. This practice allows fish to migrate away from the treatment area and towards the untreated reservoir body containing a higher dissolved oxygen concentration.

EXAMINATION OF POSSIBLE ALTERNATIVES

The City of Santa Rosa uses an Integrated Pest Management Program to guide its pest management activities. It continues to use the least toxic method for all pest control including the treatment activities for aquatic pests. Integrated pest management is an active decision making process that minimizes the use of pesticides. The process will determine if and when treatment is needed, if and when pesticide alternatives are available and can be used, and if and when actual pesticide use is the only recourse.

> *Integrated Pest Management (IPM) is a pest management strategy that focuses on long-term prevention or suppression of pest problems with minimum impact on human health, the environment and non-target organisms. These strategies require the selection, integration and implementation of various pest control techniques considering the various economic, ecological and sociological consequences.*

Identification of Potential Pests: City personnel with responsibility for pest management are trained to accurately identify pest species of animals and plants, the damage they can cause, and the control alternatives available. Field manuals, a list of Noxious Weeds as identified by the Sonoma County Agricultural Commissioner and other resources are available to staff to assist in pest identification as necessary.

Determination of Pest Management Action Level: City personnel with responsibility for pest management shall determine the annual and seasonal infestation levels that are unacceptable. These unacceptable levels are pest management action levels that indicate appropriate action must

be taken to prevent damaging infestation. The determination of these levels will be completed using, in most cases, the following criteria:

- it is determined that the pest population will reach a critical level if left untreated;
- it is determined that the pest population has reached a critical level;
- biological or environmental factors cannot be expected to reduce the pest problem within a reasonable time;
- pest management costs (including any environmental or health impacts) are less than the potential pest damage.

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- it is determined that the pest population will reach a critical level if left untreated;
- it is determined that the pest population has reached a critical level;
- biological or environmental factors cannot be expected to reduce the pest problem within a reasonable time;
- pest management costs (including any environmental or health impacts) are less than the potential pest damage.

If the determination concludes that pest management control action is necessary, District personnel responsible for pest management shall identify and/or implement the appropriate management practice.

Determination of Acceptable Pest Management Practice: District personnel responsible for pest management shall determine acceptable pest management practices using the criteria below. In not every case will these criteria be necessarily met. Judgment will be used in these cases to determine acceptable pest management practices that are:

- least damaging to the general environment;
- least hazardous to human health;
- less of an impact on non-target organisms;
- appropriate considering the absence of listed, candidate or locally rare species;
- most likely to produce a permanent reduction of the pest;
- most cost-effective in the short and long-term.

As pest management practices are developed, they may include a combination of various control alternatives. The preferred methods in an IPM program are those which permanently prevent pest problems in an environmentally sensitive manner, therefore, eliminating the potential for pest damage. Chemical controls are a last resort. Pest management practices as relates to aquatic environments may include one or more of the following elements:

- no controls are necessary;
- physical and mechanical controls (hand trimming, harvesting, drawdown, aeration.);
- biological controls (parasitic organisms);
- chemical controls (ranging from low toxicity materials to least-toxic pesticides and dyes).

ALTERNATIVES TO AQUATIC PESTICIDES

Lowering of Water Levels: Water levels can be lowered to expose aquatic pests. This allows for either physical aquatic pest removal or pesticide application above the waterline. While this alternative can be highly effective in reducing pesticide use, it is limited to periods of low demand. Typically, this would be during the winter season when aquatic weed growth is low but since all three water bodies are fed by storm water run-off; this method would not be practical.

Mechanical Harvesting: Mechanical harvesting has been performed in all three water bodies with varying results. Performed in Lake Ralphine for the control of watermilfoil, the cutting heads of the harvester were prevented from deploying too deeply due to the boulder strewn nature of the lake bottom. Control lasted three weeks. Mechanical removal of cattail and bulrush has been performed in both Fountaingrove Lake and Nielsen Pond. Because the roots of these weeds cannot be removed in either water body – along the dams in Fountaingrove Lake and a rocky shoreline in Nielsen Pond – mechanical removal is followed up with spot treatment of the re-growth resulting in reduced amounts of aquatic pesticides being used. Mechanical harvesting is a viable control method for some of the city's aquatic weed problems and will continue to be utilized.

Aeration: Aerators function to aerate the water as well as help turn it over. An aeration system was installed in Nielsen Pond for both these purposes as well as to assist with the breakdown of nutrients. As a part of the City's storm drain system, the pond receives all the pollutants that would be expected to be washed from urban streets.

Aquatic Dyes: Aquatic dyes are designed to reduce the depth to which light penetrates into a water body. Typically, dyes are used in smaller bodies of water for the control of submersed vegetation. While Nielsen Pond is of a size where dyes could be effective, aquatic weed species that might be controlled through the use of these dyes are not problematic.