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# _____
C. ☐ Change of ownership or responsibility: WDID# _____

II. DISCHARGER INFORMATION

A. Name City of San Jose			
B. Mailing Address 200 East Santa Clara Street			
C. City San Jose	D. County Santa Clara	E. State CA	F. Zip 95113
G. Contact Person Michael Mai	H. E-mail address michael.mai@sanjoseca.gov	I. Title Senior Civil Engineer	J. Phone (408) 793-4150

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: See NOI Attachment of Detail and attached maps
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: See NOI Attachment of Detail and attached maps

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

V. ALGAECIDE AND AQUATIC HERBICIDE APPLICATION INFORMATION

A. Target Organisms: ____
Algae, submersed aquatic vegetation (including watermilfoil, mosquito fern, and pondweeds) emergent vegetation (including Arundo donax, bulrush, cattails, Himalayan blackberry, salt cedar, tree of heaven, and waterprimrose), and various other invasive species (including various broom species)

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

2, 4-D (Weedar); Diquat Dibromide (Reward); Endothall (Cascade); Fluridone (Sonar); Glyphosate (Aquamaster, AquaPro, Glypro, Rodeo, Roundup Custom); Imazamox (Clearcast); Imazapyr (Habitat); Penoxsulam (Galleon SC); Sodium Carbonate Peroxyhydrate (GreenClean); and Triclopyr (Renovate)

C. Period of Application: Start Date 4/15/2020 End Date 4/14/2024

D. Types of Adjuvants Used: Various aquatically approved non ionic surfactants

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: MICHAEL MAI, P.E.

B. Signature: _____ **Date:** FEB 6, 2020

C. Title: SENIOR CIVIL ENGINEER

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 San Jose Notice Of Intent (NOI): Attachment of Detail

IV. Receiving Water Information

1. Canals, Ditches, or other constructed conveyance facilities owned and controlled by Discharger:

- The City of San Jose does not own or control conveyance facilities, but work under agreement(s) with the Santa Clara Valley Water District (SCVWD) to maintain and/or operate waterways within lands owned by the City of San Jose, and lands under right-of way easements within the city limits.
- The SCVWD works with the Army Corps of Engineers (ACOE) under Permit No. 1996-225250 for maintenance activities in streams and channels throughout the County of Santa Clara.

Names of Water Bodies Within San Jose City Limits:

Region 2: Alamitos Ponds, Almaden Lake, Almaden-Calero Canal, Anderson Reservoir, Calero Reservoir, Capitol Ponds, County Park Pond, City Park Pond, Cherry Flat Reservoir, Coyote Alamitos Canal, Coyote Canal, Coyote Perc Pond, Ford Road Ponds, Guadalupe Ponds, Helmsley Pond, Kooser Ponds, Lake Cunningham, Lone Lake, Los Capitancillos Ponds, Mabury Pond, New Chicago Marsh, Ogier Ponds, Overfelt Ponds, Parkway Pond, Penitencia Ponds, Piedmont Ponds, Pond 10 (A, B, and C), San Francisco Bay, Sunnyvale WPCP Ponds (East and West), Triangle Marsh, Twin Lakes, and Waterbird Pond.

3. Directly and adjacent to, lakes, rivers, creeks, streams, and bays:

Names of Water Bodies:

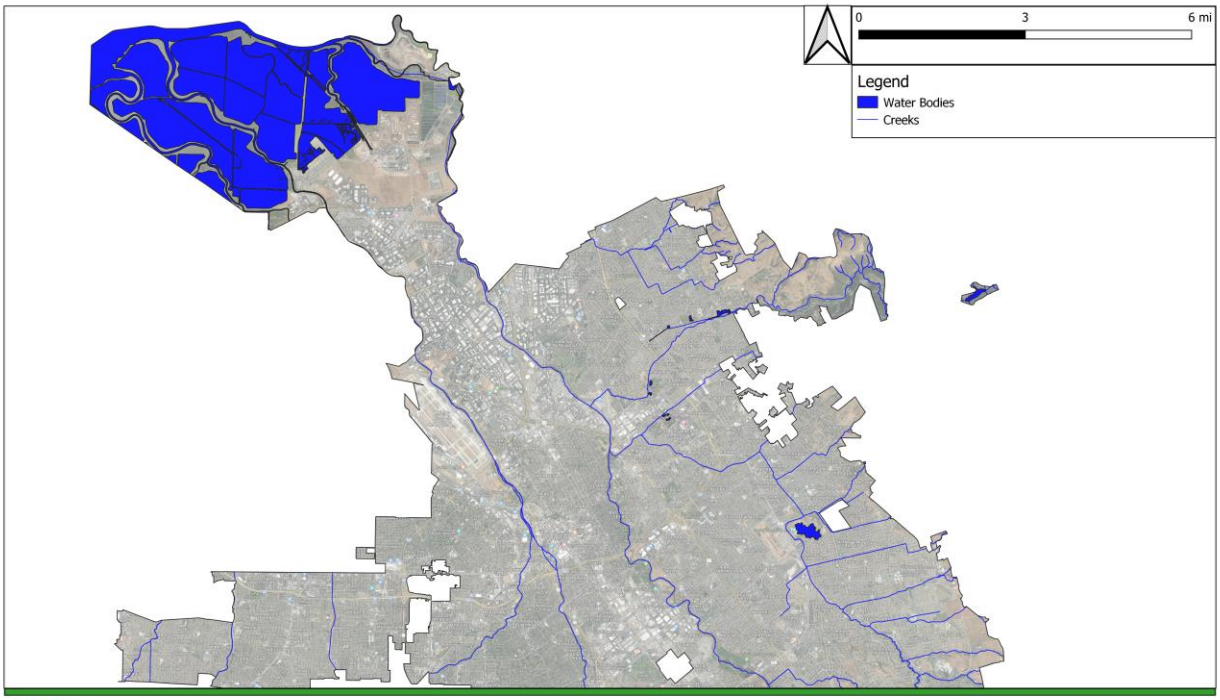
Region 2: Coyote Watershed including: Arroyo Aguague Creek, Berryessa Creek, Calero Creek, Cherry Canyon Creek, Cochran Channel, Coyote Bypass, Coyote Creek, Cribari Creek, Crosley Creek, Evergreen Creek, Fisher Creek, Flint Creek, Fowler Creek, Hawk Creek, Las Animas Creek, Lower Penitencia Creek, Lower Silver Creek, Metcalf Creek, Miguelita Creek, Misery Creek, North Babb Creek, Norwood Creek, Packwood Creek, Quimby Creek, Ruby Creek, Sierra Creek, San Felipe Creek, Silver Creek, South Babb Creek, Sweigert Creek, Thompson Creek, Upper Penitencia Creek, Upper Silver Creek, and Yerba Buena Creek.

Region 2: Guadalupe Watershed including: Alamitos Creek, Baldy Ryan Channel, Canoas Creek, Golf Creek, Greystone Creek, Guadalupe Bypass, Guadalupe Creek, Guadalupe River, Guadalupe Secondary Channel, Guadalupe Slough, Lone Hill Creek, Los Gatos Creek, Limekiln Canyon Creek, Lone Hill Creek, McAbee Creek, Randol Creek, Ross Creek, and Santa Teresa Creek.

Region 2: West Valley Watershed including: Calabazas Creek, Canoas Creek, Rodeo Creek, San Tomas Aquino Creek, Saratoga Creek, Smith Creek, Sunnyvale West Channel, and Wildcat Creek.

- For maps of water bodies within the city limits of San Jose, refer to Project Overview Maps 1 and 2.

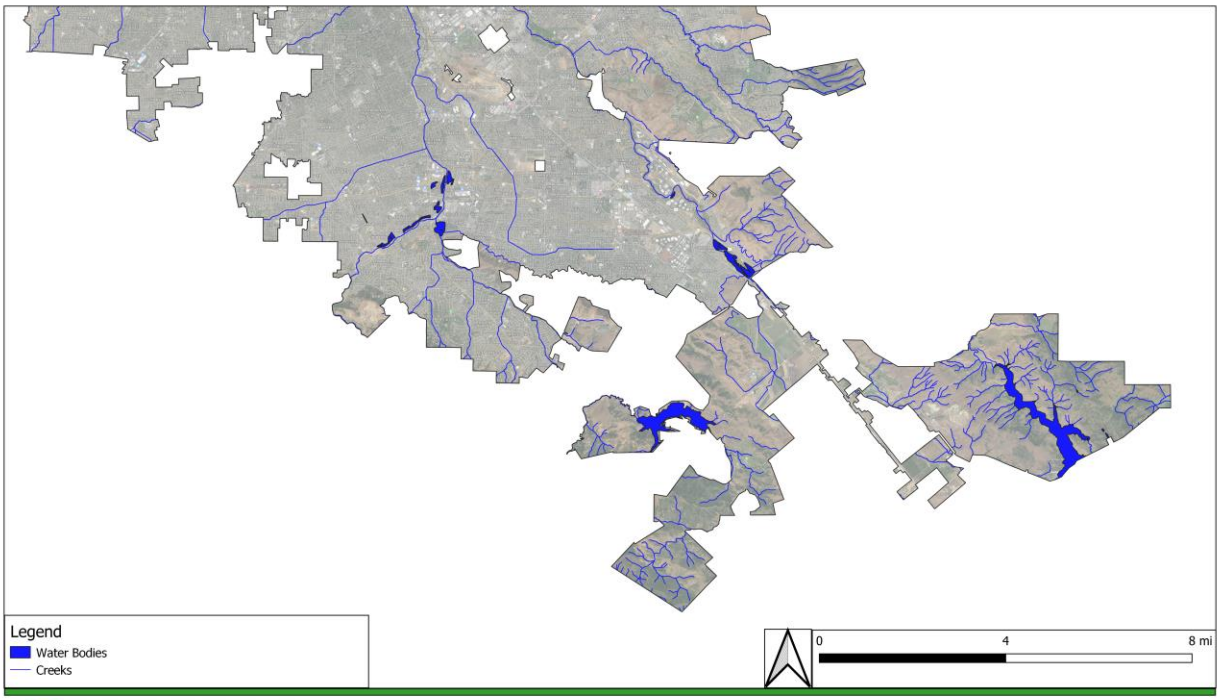
Project Overview Maps 1 and 2:



Ecological Concerns Inc.
Ecological Landscapes | Habitat Restoration | California Native Plants
125 Walk Circle, Santa Cruz CA 95060 Office: (831) 459-0656 Fax: (831) 457-1606
www.ecologicalconcerns.com

Data Sources: Google, SCVWD, CoSJ, ECI

City of San Jose
Creeks and Water Bodies
Northern Section



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Data Sources: Google, SCVWD, CoSJ, ECI

City of San Jose
Creeks and Water Bodies
Southern Section

AQUATIC PESTICIDE APPLICATION PLAN

City Of San Jose

Aquatic Pesticide Application Plan
For the
Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications
Water Quality Order No. 2013-0002-DWQ
General Permit # CAG990005

DATE: February 6th, 2020

Prepared for:
City of San Jose – Department of Public Works
200 East Santa Clara Street
Tower 5th Floor
San Jose, CA 95113-1905

Prepared by:
Ecological Concerns Incorporated
609 Pacific Avenue
Santa Cruz CA 95060
Contact: Garrick J. Hansen
(831) 247-9660

Submitted to:
State Water Resource Control Board
1001 I Street
Sacramento CA 95814
Contact: Gurgagn Chand
(916) 341-5780

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 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:

Michael Mai, P. E.
Senior Civil Engineer
City of San Jose – Department of Public Works

Garrick J. Hansen
Vegetation Management Specialist | Project Manager
Ecological Concerns Incorporated

Jonathan Laslett
Senior Project Manager | Director of Operations | Ecologist
Ecological Concerns Incorporated

City of Sana Jose, California

Aquatic Pesticide Application Plan

Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for

Residual Aquatic Pesticide Discharges to Waters of the United States from

Algae and Aquatic Weed Control Applications

Water Quality Order No. 2013-0002-DWQ

General Permit # CAG990005

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Appendix A

Appendix B

Background

The State Water Resources Control Board (SWRCB) prepared Water Quality Order # 2001-12-DWQ in March, 2001, which created the National Pollutant Discharge Elimination System (NPDES) Permit # CAG990003 for the discharges of aquatic herbicides to waters of the United States**.**Thepurpose of Order # 2001-12-DWQ was to minimize the magnitude and duration of adverse impacts to the beneficial uses of water bodies treated with algaecides and aquatic herbicides. The General Permit was aimed to substantially reduce the potential liability of the discharger incurred for releasing water treated with aquatic herbicides into waters of the United States.

Order # 2001-12-DWQ expired in late January, 2004, and in May, 2004 the SWRCB adopted the statewide NPDES No. CAG 990005 General Permit for Discharge of Aquatic Pesticides for Aquatic Weed Control in Waters of the United States. This mandated that dischargers were required to have the General Permit to perform aquatic herbicide applications. In May 2009, the General Permit expired, but was administratively continued until November 30, 2013.

The Statewide General National Pollutant Discharge Elimination System (NPDES) - Water Quality Order No. 2013-0002-DWQ General Permit No. CAG990005 for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications was adopted on March 5, 2013 and became effective on December 1, 2013 (SWRCB 2013). The General Permit requires compliance with the following:

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

Coverage under the General Permit is now available to single dischargers and potentially to regional dischargers for releases of potential and/or actual pollutants to waters of the United States resulting from pesticide applications using products containing 2,4-D, acrolein, copper, diquat, endothall, fluridone, glyphosate, imazamox, imazapyr, penoxsulam, sodium carbonate peroxyhydrate, and triclopyr-based algaecides and aquatic herbicides, and adjuvants containing ingredients represented by the surrogate nonylphenol. Public entities that conduct resource or pest management control measures are eligible for coverage under the General Permit are including local, state, and federal agencies responsible for control of algae, aquatic weeds, and other organisms that can adversely impact operation and use of drinking water reservoirs, water conveyance facilities, irrigation canals, flood control channels, detention basins, or natural water bodies.

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

Aquatic Pesticide Application Plan

In accordance with existing General Permit requirements, the City of San Jose has completed and attached a Notice of Intent (NOI) and prepared an Aquatic Pesticide Application Plan (APAP).

This APAP is a comprehensive plan developed for the City of San Jose that describes the need for the optional use of aquatically approved pesticides, what will be done to reduce water quality impacts, and how those impacts will be monitored. Specifically, this APAP contains the following eleven (11) components:

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 species/types of weed(s) and algae expected to be controlled and why;

4. Algaecide and aquatic herbicide products or types of algaecides and aquaticherbicides 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 the monitoring program;
9. Description of procedures used in order to prevent sample contamination from personnel, equipment, and vehicles involved with algaecide and aquatic herbicide application;
10. Best Management Practices (BMPs) to be implemented. The description of BMPs includes:

    - Prevention measures for algaecide and aquatic herbicide spills and spill containment in the event of a spill
    - Measures to ensure that appropriate rates of application are applied to targeted weed and algae species that are consistent with product label requirements and instructions
    - Education plan for Discharger, its staff , and applicators associated with any algaecide and aquatic herbicide treatment on how to avoid any potential adverse effects from pesticide applications
    - Planning and coordination with nearby farmers and agencies with water rights digression so that beneficial uses of the water such as drinking water supply, irrigation, and domestic stock water are not impacted during the treatment period
    - Measures that will be taken for preventing fish kill when algaecides and aquatic herbicides will be used for algae and aquatic weed controls

11. Evaluation of possible alternative control measures Dischargers should examine for reducing the use of algaecide and aquatic herbicides and the need for applying algaecides and herbicides. Methods to be discussed include:

    - 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:

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

            - If there are no feasible alternatives to the use of algaecides and aquatic herbicides, the City of San Jose will use the minimum amount of algaecides and aquatic herbicides possible to have an effective control program that is consistent with all of the algaecide and aquatic herbicide product label requirements.

    - Using the least intrusive method of algaecide and aquatic herbicide application
    - Applying a decision matrix for choosing the most appropriate algaecide and aquatic herbicide formulation.

The City of San Jose does not own water conveyance facilities such as rivers, creeks, or channels, but works in agreements(s) with the SCVWD to perform maintenance and operations of these facilities within the city limits. Refer to Project Overview Maps 1 and 2 in Appendix A for water features located within San Jose city limits.

Using an Integrated Pest Management or IPM approach, the City of San Jose intends to apply algaecides and aquatic herbicides identified in the attached Notice of Intent to Comply (NOI), hereby submitted to the RWQCB for Region 2. The following Aquatic Pesticide Application Plan (APAP) for the City of San Jose is outlined below and is designed to follow the Statewide General NPDES Permit for Residual Aquatic Pesticide Discharges to Waters of the United States from Algae and Aquatic Weed Control Applications, Water Quality Order No. 2013-0002-DWQ, General Permit No. CAG990005.

Problematic algae and aquatic vegetation grows in and along the streams, flood control, and other drainage conveyances and groundwater recharge ponds within the city limits. The presence of the algae and aquatic weeds discussed in Component 3 beyond tolerable thresholds or nuisance levels can have an adverse impact on water quality, flood control, and city operations, and the need to use algaecides and aquatic herbicides to control problematic aquatic vegetation and algae may become necessary.

Component 1: Description of the Water System

The City of San Jose owns and operates stormwater conveyance systems that are discharged into creeks or channels such as underground storm drain piping, as well as a small retail drinking water distribution system that provides drinking water to some of its residents. Under an existing grant funding agreement with Santa Clara Valley Water District (Water District), the City will remove invasive plants at several locations along Coyote Creek where the City owns the lands. Future grant agreements may be pursued as appropriate between City and SCVWD for the invasive plant removal in other locations and waterways where City owns the lands.

The ponds were created to encourage the recharge of groundwater that is being removed from the aquifers due to groundwater pumping, and are typically designed as a series of basins that are connected by weirs, gates, or fixed elevation spillways. While some ponds do not have a connection to downstream natural water bodies, other ponds are connected by pipes, weirs, or screw-gates. The groundwater recharge ponds within the city limits of San Jose that are managed by the SCVWD in Water Quality Control Board Region 2 are: Alamitos Ponds, Almaden Lake, Almaden-Calero Canal, Anderson Reservoir, Calero Reservoir, Capitol Ponds, County Park Pond, City Park Pond, Cherry Flat Reservoir, Coyote Alamitos Canal, Coyote Canal, Coyote Perc Pond, Ford Road Ponds, Guadalupe Ponds, Helmsley Pond, Kooser Ponds, Lake Cunningham, Lone Lake, Los Capitancillos Ponds, Mabury Pond, New Chicago Marsh, Ogier Ponds, Overfelt Ponds, Parkway Pond, Penitencia Ponds, Piedmont Ponds, Pond 10 (A, B, and C), San Francisco Bay, Sunnyvale WPCP Ponds (East and West), Triangle Marsh, Twin Lakes, and Waterbird Pond.

Within the city limits of San Jose, the SCVWD maintains a large surfacewater conveyance system to ensure efficient conveyance of water where flood control and stormwater flows are of concern, as well as creeks, rivers and streams throughout the county for non-native invasive species, and efficient conveyance of stormwater. The drainage system receives urban runoff and drainage throughout the year, and stormwater runoff during wet months.

The following water features are primarily maintained by the SCVWD, but lye within the city limits of San Jose:

Region 2:

Coyote Watershed: Arroyo Aguague Creek, Berryessa Creek, Calero Creek, Cherry Canyon Creek, Cochran Channel, Coyote Bypass, Coyote Creek, Cribari Creek, Crosley Creek, Evergreen Creek, Fisher Creek, Flint Creek, Fowler Creek, Hawk Creek, Las Animas Creek, Lower Penitencia Creek, Lower Silver Creek, Metcalf Creek, Miguelita Creek, Misery Creek, North Babb Creek, Norwood Creek, Packwood Creek, Quimby Creek, Ruby Creek, Sierra Creek, San Felipe Creek, Silver Creek, South Babb Creek, Sweigert Creek, Thompson Creek, Upper Penitencia Creek, Upper Silver Creek, and Yerba Buena Creek.

Guadalupe Watershed: Alamitos Creek, Baldy Ryan Channel, Canoas Creek, Golf Creek, Greystone Creek, Guadalupe Bypass, Guadalupe Creek, Guadalupe River, Guadalupe Secondary Channel, Guadalupe Slough, Lone

Hill Creek, Los Gatos Creek, Limekiln Canyon Creek, Lone Hill Creek, McAbee Creek, Randol Creek, Ross Creek, and Santa Teresa Creek.

West Valley Watershed: Calabazas Creek, Canoas Creek, Rodeo Creek, San Tomas Aquino Creek, Saratoga Creek, Smith Creek, Sunnyvale West Channel, and Wildcat Creek.

Refer to Project Overview Maps 1 and 2 in Appendix A - Water Features Within San Jose City Limits

Component 2: Description of the Treatment Area

The City of San Jose may apply algaecides or aquatic herbicides to the ponds or surface water conveyances previously discussed in Component 1, if aquatic weeds or algae treatment thresholds are met.

Component 3: Description of Weeds and Algae

Weeds found throughout the facilities within the city limits include emergent, floating, and submerged aquatic vegetation and algae. The submersed and floating vegetation species include but are not limited to Chara (*Chara spp*.), watermilfoil (*Myriophyllum spp*.), pondweeds (*Stuckenia pectinata*and *Potamogeton spp*.), duckweed (*Lemna spp*.), mosquitofern (*Azolla spp*.), planktonic algae, and filamentous algae. Emergent wetland and riparian vegetation includes but is not limited to cattails (*Typha spp*.), bulrush (*Bolboschoenus spp.*, *Isolepis spp.*, *Schoenoplectus spp.*, and *Scirpus spp*.), giant reed (*Arundo donax*), himalayan blackberry (*Rubus armeniacus*), salt cedar (*Tamarix spp*.), tree of heaven (*Ailanthus altissima*), and waterprimrose (*Ludwigia spp*.), and various broom species (e.g. *Cytisus spp.* and *Genista spp*.).

The presence of these weeds and others in fluent waterways can adversely impact water flow and reduce the flood or stormwater capacity. Algae and submersed aquatic vegetation in groundwater recharge ponds can decrease water capacity, reduce the recharge potential, create nuisance odors, and increase the level of required pond maintenance.

Notes:

- Growth of one of the aquatic weed species described above can be spot treated to eliminate the growth if localized blooms are detected early.
- Rapid blooms of the aquatic weed species described above have potential to spread throughout an entire lake creating nuisance conditions throughout, and may necessitate performing an entire lake treatment.
- Planktonic algae blooms impact the entire lake system so generally entire lake treatments would be needed to eliminate algae blooms. However, low dissolved oxygen levels could require multiple smaller treatments.
- Filamentous algae growth consisting of floating mats along specific shorelines in any of these systems can be controlled through spot treatment.

Component 4: Algaecides and Aquatic Herbicides To Be Used, Known Degradation Byproducts, Application Methods, and Adjuvants And Surfactants To Be Used

Table 1 below lists the herbicides and algaecides that would be utilized for the control of the plant and algae species listed above, as well as any other invasive species that may be encountered in future projects. Various adjuvants and surfactants labeled for aquatic use may be used in combination with these herbicides and algaecides to enhance the efficacy of the treatment. Aquatically approved adjuvants and surfactants must be added to algaecide and aquatic herbicide formulations in the proper mixing sequence and will be verified to be compatible prior to any applications. Adjuvants containing ingredients represented by the surrogate nonylphenol will not be used. All herbicide solutions and applications will be made in accordance with all product label instructions.

Table 1: Algaecides and Aquatic Herbicides Expected to be Used

Herbicide	Application Method(s)	Adjuvant	Byproducts
2,4-D	Backpack Sprayer, Handgun, or Boom Sprayer	Various Aquatically Approved Adjuvants	acid form
Diquat Dibromide	Submersed Boom, Handgun, or Boom Sprayer	Various Aquatically Approved Adjuvants	Binds with organic matter and accumulates in sediment
Endothall	Submersed Boom/Injection, Handgun or Boom Sprayer, or Spreader (Granules)	Not Applicable	Glutamic acid
Fluridone	Submersed boom, or spreader	Not Applicable	n-methyl formamide (NMF), 3-trifluoromthyl benzoic acid
Glyphosate	Backpack Sprayer, Handgun, or Boom Sprayer	Various Aquatically Approved Adjuvants	carbon dioxide and phosphates
Imazamox	Backpack Sprayer, Handgun, or Boom Sprayer	Various Aquatically Approved Adjuvants	nicotinic acid and di- and tricarboxylic acids
Imazapyr	Backpack Sprayer, Handgun, or Boom Sprayer	Various Aquatically Approved Adjuvants	pyridine hydroxy-dicarboxylic acid, pyridine dicarboxylic acid (quinolinic acid), nicotinic acid
Penoxsulam	Backpack Sprayer, Handgun, or Boom Sprayer	Not Applicable	BSTCA, 2-amino-TCA, 5-OH-penoxsulam, SFA, sulfonamide, and 5,8-di-OH
Sodium Carbonate Peroxyhydrate	Handgun, Boom Sprayer (Liquid), or Spreader (Granules)	Not Applicable	breaks down to sodium carbonate and hydrogen peroxide in water
Triclopyr	Backpack Sprayer, Handgun, or Boom Sprayer	Various Aquatically Approved Adjuvants	1,2,3-Trichloropropane

Component 5: Factors Influencing Algaecide And Aquatic Herbicide Use

All treatment of invasive aquatic vegetation performed by the City of San Jose will be approached and determined by the application of an integrated pest management (IPM) approach for controlling aquatic weeds and/or algal bloom infestations. The primary goal of the IPM program is to establish general and reasonable sets of control measures that aid in controlling and managing invasive aquatic vegetation populations, while also considering public safety and health, economic, legal, and aesthetic requirements. The nuisance level or action threshold is the stage at which control actions should be taken to manage aquatic vegetation before the water feature is significantly impacted. Any established action threshold/nuisance levels may be subject to public expectations. One of the central features of control measures selected through IPM is to determine whether or not treatment actions are absolutely necessary. The presence of some aquatic vegetation species can be a sign of a flourishing and well-balanced ecosystem. Some typical problems associated with action thresholds of aquatic vegetation or algal blooms are the impedance of flow, adverse impacts to water quality, a reduction in flood control capabilities, a decrease in water capacity, or the creation of a general nuisance. When established thresholds of aquatic vegetation or algae are met or exceeded, a control method should be implemented. The choices of selectable control methods utilized may include but are not limited to the use of circulation, aeration, shading and dyes, benthic barriers and bottom screens, native species establishment, mechanical or physical, cultural, biological control agents. Aquatic herbicide and algaecide applications are considered a critical piece of the City of San Jose's IPM plan, and may or may not be selected as a last resort control method. Chemical treatment of some aquatic weed species can be the most effective, economical, long lasting, least labor intensive, and may be the only available method of control.

Aquatic herbicide and algaecide applications may be made prior to the exceedance of established thresholds based on densities, growth rate predictions and previously observed trends, weather, water flow, and prior experience. Aquatic weeds and algal blooms may be appropriately treated soon after emergence and before becoming problematic depending upon the formulation of the algaecide or aquatic herbicide selected for control. Treating infestations before they become developed and mature reduces the total amount of algaecide and aquatic herbicide needed as immature aquatic weeds present a lower target mass, and are more susceptible to chemical treatment. In addition, treating aquatic weeds and algae within the ideal phenological stage of their growth cycle ensures that the selected control

method will be the most effective and results in lower levels of effort required in the future, such as treating populations before they develop seeds, tubers or other reproductive organs. Determining the appropriate algaecide and aquatic herbicide(s) and selecting the correct rate of application is done based on target species identification, its growth stage, and the listing of that algae or aquatic weed on the product label as a species that it controls.

The final decision to use an algaecide or aquatic herbicide and the product selection(s) is based on the Pest Control Recommendation (PCR) of a Pest Control Advisor (PCA) possessing a current license issued by the California Department of Pesticide Regulation (CDPR). The evaluation of alternative control options is an essential aspect of the IPM approach, which can involve the selection of alternative treatment as a test program to evaluate efficacy. The PCA bases the PCR on available control methods that are the most effective and least impactful on the environment. This may include using manual, mechanical, cultural, biological, or chemical techniques alone, or a combination of these methods. Alternative control techniques are generally more expensive, labor intensive, can temporarily degrade water quality, risk further spread of the infestation, and may not be as effective. A detailed description of alternative control methods is presented in Component 11 of this document.

Component 6: Gates and Control Structures

The City of San Jose operates and maintains thousands of outfalls and flap gates that discharge into various waterways such as Coyote Creek and Guadalupe River under the permission of the Santa Clara Valley Water District. If necessary or applicable, the city staff will close gates, valves, or other structures during an algaecide or aquatic herbicide application to control the degree, if any, that receiving waters will be affected by algaecides or aquatic herbicide residues.

In order to assess the presence or possibility of leaks, all appropriate control structures within the treatment area(s) will be thoroughly inspected prior to and during any application. The Aquatic Herbicide Application Log will be the appropriate form used to document these inspections. In the event that any leaks develop on closed valves or gates, they will be stopped as soon as practicable. The Aquatic Herbicide Application Log (AHAL – see Figure 1 in Appendix B) addresses all of the criteria in Attachment C of the General Permit, and will be filled out for each algaecide and herbicide application. It includes the following information:

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

Refer to Figure 1 in Appendix B

Component 7: State Implementation Policy (SIP) Section 5.3 Exception

The City of San Jose has not been granted a short-term or seasonal exception under State Water Board Policy for Implementation of Toxics Standards. If needed, the General Permit allows the City of San Jose to apply for a SIP Section 5.3 Exception for the use copper or acrolein. If granted, this section will be amended to describe the exception period as outlined in the required CEQA documentation. The City of San Jose does not currently have a SIP exception and will not apply any copper or acrolein unless a SIP Exception is applied for and granted.

Component 8: Description of Monitoring and Reporting Program (MRP)

The Code of Federal Regulations Section 122.48 of title 40 requires that all NPDES permits specify monitoring and reporting requirements. Developed within the guidelines of Attachment C of the General Permit, The City of San Jose will implement the following Monitoring and Reporting Program (MRP) that addresses the following:

- Whether or not the residual algaecides and aquatic herbicides discharge cause an exceedance of the receiving water limitations.

- Whether or not the discharge of residual algaecides and aquatic herbicides cause or contribute to an exceedance of the toxicity objective, referred to "no toxics in toxic amounts". This includes all active ingredients, inert ingredients, and degradation byproducts.

Data Collection

Qualified personnel shall perform visual data collection for site monitoring and reporting for all algaecide and aquatic herbicide applications at all treatment sites, and observational data will be recorded using Figure 1, and Figure 2, and/or Figure 3 (as required – see Appendix B). As discussed in Component 2, Figure 1 is the Aquatic Pesticide Application Log, whereas Figure 2 and Figure 3 are the Aquatic Herbicide Field Monitoring and Sampling Forms for moving water (Figure 2) and static water (Figure 3). All inclusions in Figures 2 and 3 meet the requirements of monitoring and reporting program described in Attachment C of the General Permit.

Refer to Figure 2 and Figure 3 in Appendix B

Monitoring Locations and Frequency

Water quality sampling for glyphosate will be conducted for one application event from each environmental setting per year, including both flowing water and non-flowing water. Applications of products that contain sodium carbonate peroxyhydrate do not require water quality sampling. The City of San Jose will collect samples from a minimum of six application events for each active ingredient in each environmental setting per year for applications of all other algaecides and aquatic herbicides listed on the General Permit. If there are less than six application events in a year for an active ingredient, the City of San Jose will collect samples for each application event in each environmental setting.

If six consecutive sampling events show results of concentrations that are less than the applicable receiving water limitation or trigger in an environmental setting, the City of San Jose will reduce the frequency of sampling for that active ingredient to one sample per year in that environmental setting. However, if the annual sampling shows exceedances of the applicable receiving water limitation or trigger, the City of San Jose will be required to return to sampling six applications the following year, and thereafter until sampling may be reduced again.

Sampling sites will be selected to best represent the treatment variations that occur, including algaecide or aquatic herbicide use, hydrology, and environmental setting, conveyance or confinement type, seasonal, and regional variations. The exact location(s) of sample site(s) will be determined after sufficient site scouting, along with the decision to proceed with an aquatic herbicide application in accordance with the IPM approach and PCR. Figures 3 and 4 will be the forms used to document all sampling.

Sampling Locations

All sampling will include a background monitoring, event monitoring, and post-event monitoring as described below:

Background Monitoring: In fluent or moving water, the background (BG) sample will be collected upstream of the treatment area at the time of the application event, or in the treatment area up to 24 hours in advance of the application event.

Event Monitoring: The event monitoring (Event) sample for flowing water will be collected immediately downstream of treatment area and immediately after the application event, but after sufficient time has elapsed such that treated water would have exited the treatment area. For sampling in non-flowing or static water, the sample will

be collected immediately outside of the treatment area immediately after the application event, but after sufficient time has elapsed such that treated water would have exited the treatment area.

The location and timing for the Event sample collection will be based on a number of factors including, but not limited to algae and aquatic weed species, density, water flow rates, size of the treatment area and duration of the application.

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

Sampling Notes:

- One full set of three samples (BG, Event, and Post) will be collected during each application from the representative location(s) of the treatment area according to the monitoring frequency and locations described above.
- One Field Duplicate (FD) and one Field Blank (FB) will also be collected and submitted for analysis for each analyte once per year. The FD and FB samples will be collected at the Event site immediately after application. Refer to Figures 3 and 4 for the appropriate field sampling forms to be used.

Sample Collection

If the water depth is 6 feet or greater, the sample will be collected at a depth of 3 feet. If water depth is less than 6 feet, the sample will be collected at the approximate mid-depth. An intermediary sampling device such as a Van-Dorn style sampler or long-handled sampling pole may be used for locations with access difficulties. Long-handled sampling poles with an attached sampling container will be upturned before being lowered into the water to the chosen sample depth, where it will then be turned upright to collect the sample.

Field Measurements

During sample collection, temperature will be recorded in the field, as well as turbidity, electrical conductivity, pH, and dissolved oxygen using field meters as available, or analyzed in the laboratory as necessary. All field meters for measuring turbidity, electrical conductivity, pH, and dissolved oxygen will be calibrated by the manufacturer or according to the manufacturer's specifications at the recommended frequency, and checked with a standard before each use. Electrical Conductivity meters are calibrated with throughout the year at one month intervals in order to evaluate instrument performance, and the conductivity probe will be recalibrated if outside of the manufacturer's specifications. Calibration logs will be used and maintained for all field meters to properly document instrument calibration.

Field personnel will be properly trained on how to operate the meters to ensure quality control, and protocols will conform to United States Environmental Protection Agency (U.S. EPA) guidelines or to procedures approved by the State Water Board and the appropriate Regional Water Board.

Sample Preservation and Transportation

Once a sample is collected and labeled, it will be immediately placed in a dark and cold environment such as an iced cooler at 4 degrees Celsius. Based on the sample requirements, samples will either be collected in preserved or unpreserved containers. If necessary, preservatives shall be added to sampling bottles before sampling occurs by the laboratory supplying the containers and performing the analysis. Samples collected in unpreserved containers will be preserved at the laboratory once the sample(s) are delivered, if required. Laboratory delivery of the sample(s) should occur on the same day or the following day of collection. If samples cannot be delivered on the day of the sampling event they will remain on ice in a cooler until delivered to the lab within the appropriate holding time.

BG, Event, and Post monitoring samples will be properly labeled and separated in plastic bags within the iced cooler to avoid any cross contamination.

All samples are to be packed and transported the day of, or the following day the samples are collected to provide ample time for samples to be analyzed within the required holding time. Ice must be included in coolers containing samples that require temperature control. Samples will be packaged in the following manner:

- Sample container stickers will be checked for secure attachment to each sample container.
- The sample containers will be placed in the lined cooler with suitable padding between samples to protect the containers from breakage during shipment and handling such as bubble-wrap, foam, or newspaper.
- Along with sample containers, the Chain of Custody (COC) will be placed inside a plastic bag and placed inside the cooler, and will indicate each sample identification name, time and place of sample collection, the sample collector, the required analysis, turn-around-time, and location to which data will be reported.
- When ready, the cooler will then be delivered directly to the laboratory.

Sample Analysis

Table 2 below for analytes that must be measured for each sample.

Table 2: Water Sample Monitoring Analytes

Analyte	EPA Method	Reporting Limit	Hold Time (Days)	Container	Chemical Preservative
Temperature (1)	N/A	N/A	N/A	N/A	N/A
Dissolved Oxygen (1)	360.1 or 360.2	0.0 mg/L	1	1L Amber Glass	None
Turbidity (2)	180.1	0.00 NTU	2	100 mL HDPE	None
Electrical Conductivity (2)	120.1	0 µS/cm	28	100 mL HDPE	None
pH (2)	150.1 or 150.2	1-14	Immediately	100 mL HDPE	None
2,4-D	8151, 8150A, 615	0.5 µg/L	7	1L Amber Glass	None
Triclopyr	8151, 8150A, 615	0.5 µg/L	7	1L Amber Glass	None
Diquat	549	40 µg/L	7	500 mL Amber HDPE	H2SO4
Endothall	548.1	40 µg/L	7	100 mL Amber Glass or 2 x 40 mL VOA	None
Fluridone	SePro FasTest	1 ug/L	7	30 ml Amber HDPE	None
Glyphosate	547	0.5 µg/L	14	2 x 40 mL VOA	None
Imazamox	HPLC	50 ug/L	14	2 x 40 mL VOA	None
Imazapyr	532m	100 ug/L	14	1 L Amber Glass	None
Nonylphenol (3)	550.1m	0.5 µg/L	7	2 x 40 mL VOA	None
Penoxsulam	532m	20 ug/L	7	1 L Amber Glass	None

Table Notes:

- Chemical analysis is only required for the algaecide or aquatic herbicide active ingredient(s) used in treatment.
- Analysis is not required for algaecides and aquatic herbicides that contain sodium carbonate peroxyhydrate.
- (1) – Field measured.
- (2) – May be field or laboratory measured.
- (3) – Only required when a nonylphenol-based adjuvant is used.
- EPA Methods are taken from National Environmental Methods Index (NEMI).

Reporting Procedures

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

As described in Attachment C of the General Permit, the annual report will contain the following:

- An Executive Summary discussing the compliance or violation of the General Permit and the overall effectiveness of the APAP.
- A summary of the monitoring data identifying any water quality improvements or degradation attributable to algaecide or aquatic herbicide application.

The City of San Jose 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 City of San Jose will submit the annual information collected, including:

- An Executive Summary discussing compliance or violation of the General Permit and the overall effectiveness of the APAP in order to reduce or prevent the discharge of any pollutants associated with herbicide applications
- A summary of monitoring data identifying any water quality improvements or degradation attributable to algaecide or aquatic herbicide application, if necessary, and recommendations for any improvements to the APAP and monitoring program based upon the monitoring results, including the outlined BMPs. All receiving water monitoring data shall be compared to applicable receiving water limitations and receiving water monitoring triggers.
- Identification BMPs and discussion of their effectiveness in meeting the General Permit requirements.
- A discussion of BMP modifications needed to address any violations of the General Permit.
- A map illustrating the location of each treatment area.
- Chemical formulations and quantities of aquatic herbicides used at each application event during each treatment.
- Information regarding surface area and/or volume of treatment area and any other information used to calculate dosage, concentration, and quantity of each aquatic herbicide used.
- Sampling results shall indicate the name of the sampling agency/organization, sampling location information (including GPS coordinates and/or township/range/section), a detailed map or description of each sampling area, sample collection date, name of constituent/parameter and its detected concentration, minimum levels, the method detection limits for each constituent analysis, name or description of water body sampled, a comparison with applicable water quality standards, and a description of analytical Quality Assurance/Control plan. Sampling results shall be structured so that they are readily perceptible.
- A summary of Aquatic Herbicide Application Logs (Figure 1).

Sampling Methods and Guidelines

The reason for this section is to present the methods and guidelines for the collection and analysis of samples necessary to meet the APAP objective of assessing any adverse impacts to beneficial uses of water bodies treated with algaecides and aquatic herbicides. This section describes the techniques, equipment, analytical methods, and quality assurance/control procedures for all sample collections and analysis. Guidance for the preparation of this section is taken from NPDES Storm Water Sampling Guidance Document (USEPA 1992); Guidelines and Specifications for Preparing Quality Assurance Project Plans (USEPA 1980); and U.S. Geological Survey, National Field Manual for the Collection of Water Quality Data (USGS 1995).

Sample Kit

Prior to departing to the field to collect samples, the following equipment will be prepared for use:

- Laboratory-supplied sampling bottles (one set for each sample, plus spares and QA/QC samples)
- NPDES application and watering forms (Figures 2, 3, and 4)
- Chain of Custody forms
- Field data logbook and QA/QC manual
- Zip lock style bags for paperwork
- Approved sampling bottles (enough for each sample to be collected plus spares)
- Sample labels (enough for each sample to be collected plus spares)

- Sharpie Pen or alternative permanent/water-proof ink marker
- Clear Mailing Tape
- Cooler for samples
- Ice or blue ice packs for cooler
- Non-phosphate cleaner
- Deionized or distilled water
- Multiparameter YSI sonde (electric conductivity, dissolved oxygen, pH, turbidity, and temperature)
- Flow meter (for moving water applications - optional)
- Grab pole or Van-Dorn style sampler
- GPS for sampling locations
- Nitrile or non-powdered plastic gloves
- Rubber boots or waders
- Eyewash
- Stop or wrist watch
- Camera

Surface Water Sampling Techniques and Procedures

As previously discussed in the Sample Collection section, if the water depth is 6 feet or greater the sample will be collected at a depth of 3 feet, and if the water depth is less than 6 feet the sample will be collected at mid-depth. An intermediary sampling device such as a Van-Dorn horizontal/vertical sampler, Kemmerer sampler, or telescoping long-handled sampling pole will be used for locations that are more difficult to access. Long -handled sampling poles with an attached sampling container will be upturned prior to being lowered into the water to the chosen sample depth, where it will then be returned to the upright position in order to collect the sample. All possible steps will be taken to prevent the samplers from physically entering the water body during the sampling process including utilizing the shoreline, any docks present in the treatment area, or available boats. If refraining from entering the water body is not possible, the following protocol will be followed to collect a proper sample:

- Sampler will enter the water body downstream or down flow of the sampling location in order to prevent any disturbance that might affect the sample.
- Personal protective equipment (PPE) will be worn by the sampler including but limited to a life vest and waders.

All Samples will be collected in a manner that minimizes the amount of suspended sediment and debris in the sampling container. All surface water samples will be collected directly into the sampling container, or by an intermediary container in the event that the primary sampling container cannot be adequately or safely used. All intermediary sampling containers will be composed of either poly (plastic/HDPE), glass, or stainless steel. Disposable poly or glass containers can be utilized, and any container that is to be reused between sampling locations will be washed thoroughly and triple rinsed before the collection of the next sample (refer to section 8.8.4).

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

1. The sample container will be lowered to the chosen water column depth if the depth, and the capped end of the container will be oriented away from the flow of water in order to minimize the potential of debris entering the sample.
2. Once the sampling container is at the correct depth and positioned correctly, the cap will be removed to allow the sample container to fill. Once filled the cap will be replaced and the pre-labeled container will be removed from the water and placed in an iced cooler.
3. When collecting samples with a water bottle sampler by hand with bottles containing preservatives, a clean unpreserved sample bottle will be used to collect the sample. The collection procedure will be the same steps outlined above with the additional following step:

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

When collecting samples with a telescoping long handled sampling pole, the instrument will be washed thoroughly with appropriate cleaner and distilled water before use. The instrument will then be washed once again with the water

from the new sampling location before samples are collected. Once the sampling instrument is prepared, the following steps will be followed:

1. Invert and lower the telescoping long handled sampling pole to the surface of the water body or at the desired water column depth if the depth.
2. Turn the inverted telescoping long handled sampling pole upright at the desired depth to fill the sample, and then remove the instrument from the water.
3. Immediately transfer the sample from the telescoping long handled sampling pole sampler to the pre-labeled unpreserved or preserved sample bottle, cap the new bottle, and place in an iced cooler.

When collecting a sample using a subsurface water sampler such as aHorizontal or Vertical Van Dorn sampler or Kemmerer sampler, the following steps will be followed:

1. Lower the subsurface water sampler to the chosen water column depth.
2. Once confirmed that the sampler is at the correct depth, release the weighted messenger or comparable trigger device to close the sampling device.
3. Raise the sampler back to the shoreline or collection vessel and immediately transfer the sample to the pre-labeled unpreserved or preserved sample bottle, cap the new bottle, and place it in an iced cooler.

Visual parameters will be summarized on the proper Monitoring and Reporting Data Form (Figures 3 and 4) including the description of the monitoring area, the appearance of the waterway, current weather conditions, and notes on receiving water conditions.

A log of the receiving water conditions will be compiled and maintained while conducting the receiving water sampling throughout the reach bounded by the treatment area. Specific attention will be given to the presence or absence of:

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

Sample Containers

All field sampling personnel will be supplied with clean and empty sampling containers with caps in protective cardboard cartons or ice chests by the primary laboratory. All sampling containers will be certified as clean by either the laboratory or the container supplier. For data quality assurance/control, the sampler will utilize the appropriate sample container as specified by the laboratory for each sample type. Sample container types, holding times, and appropriate preservatives are listed in Table 2. Prior to sampling, each container will be pre-labeled with discrete sample numbers for each sample location, the sampler's name, as well as the date and time of sample collection in waterproof ink.

Sampling Equipment Cleaning

In the event that sampling equipment will be used in more than one location, the equipment will be thoroughly cleaned with a non-phosphate cleaner, triple-rinsed with distilled water, and then rinsed once at the new sample collection location with the water being sampled prior to its first use.

Field Sampling Operations

Field Logbook

All monitoring and treatment data forms will be placed in a project logbook or three ring binder designated for

all project documentation , and will be maintained by members of the sampling team in order to provide a record of sample location, significant events, observations, and measurements taken during sampling. Whenever possible, observations and measurements should be supplemented with pictures of site conditions at the time of sampling. The purpose of the field logbook or binder is to provide sufficient observations and data to enable project team members to reconstruct events that occurred during the sampling, and must be accurate, detailed, and legible.

Alteration of Sampling Techniques

Difficult field conditions such as water levels, weather, and/or other environmental factors and hazards including stream flow, rainfall, and irrigation water use may pose access and/or sampling problems may necessitate modifications of the outlined sampling procedures. Any variations from standard procedures and planned sampling locations and/or frequencies will be documented by appropriate entries in the field logbook.

Flow Estimation

Flow estimation measurements will be made for all moving water sampling locations. For estimating water flow, a calibrated meter will be placed as close to the center of the stream or creek as possible to take a reading to measure feet per second (ft/sec). In the event this is not possible, the time that a common floating object such as a floating leaf or branch travels over a known distance can be estimated and represented in ft/sec. If this method of flow estimation is needed, a minimum distance of 25 feet will be used.

Chain-of-Custody (COC)

All samples collected and submitted for laboratory analysis will be accompanied by a chain of custody (COC) form/record. The COC record will be used as physical evidence of sample custody. The COC form will include:

- A distinct field sample number which identifies each individual sample to be analyzed
- Sample location
- Collection date and time
- The method for analysis
- Sampler information
- Custody transfer signatures

The sampler will complete a COC record to accompany each sample shipment from the field to the laboratory. When samples are transferred to the custody of the laboratory, the individuals handing over and receiving the samples will sign, date, and record the time the transfer was made on the COC form. Upon the receipt of the samples, laboratory personnel will ensure that the contents of the ice chest(s) are accurately described by the COC. Any corrections to the COC will be made by drawing a line through, initialing, and dating the error, and entering the correct information Original copies of COC forms will remain with the lab and a duplicated copy will be given to the individuals delivering the samples. All copies will be placed with the monitoring forms in the project binder or folder. For samples that need to be shipped to the laboratory, a signed copy of the COC will be included with the shipment and a signed copy will be requested from the lab. All shipping information and COC copies will also be kept with the monitoring forms in the project binder or folder.

Document Corrections and Control

No documents will be thrown away or destroyed, even if they contain inaccuracies or recordings are illegible and require correction. Any errors that are made on a document used by an individual will be corrected by making a line through the error and entering in the correct information. No information will be abolished, and all corrections will be clearly initialed and dated. All documentation including the filed logbook and laboratory data will be stored in an established central file location.

Quality Assurance and Quality Control (QA/QC)

The City of San Jose will be required to keep a Quality Assurance and Quality Control (QA/QC) maintenance and calibration manual for any onsite field measurements such as electrical conductivity, dissolved oxygen, pH, turbidity, and temperature. The QA/Quality Control Program must conform to the guidelines of the United States

Environmental Protection Agency (U.S. EPA) or to the procedures approved by the State Water Board and the appropriate Regional Water Board. The manual will include all of the steps followed in this program, and will be kept by the City of San Jose to be available for inspection by the State Water Board and the Regional Water Board.

The purpose of QA/QC is to assure and control the data quality created during sample collection and analysis. Quality assurance and quality control can be measured in several ways, including accuracy, precision, completeness, representativeness, field duplicates (FD), field blanks (FB) and as described below:.

- **Accuracy** is a measure of how close data are to their actual or true values.
- **Precision** is a measure of the variability of a group of measurements under a given set of circumstances or conditions, which assesses the duplicability/reproducibility of field and laboratory techniques.
- **Completeness** is defined as the percentage of measurements taken that are deemed to be valid measurements.
- **Representativeness** refers to samples or a sample group that reflects the level of how well or how accurately something reflects upon a sample in order to assess whether the information obtained during the sampling and analysis represents the actual site conditions.
- F**ield duplicates (FD)** quantify precision or reproducibility of the chosen field sampling technique, and involves the duplication of the technique used for a specific field sample collection method and the comparison of the initial and duplicate values. A FD can be collected at the same time as the actual field sample.
- **Field blanks (FB)** can assure that a specific field sampling technique, equipment, equipment cleaning, or materials do not result in a false positive or negative during the collection of the sample. A FB can be prepared using distilled water and can be collected at the same time as the actual field sample.

Laboratory QA/QC Process

Laboratory accuracy and precision will be monitored by generating a series of laboratory quality control samples. No additional effort will be required from the sampler, as long as a sufficient sample volume will be collected and submitted to the laboratory. Each each set of field samples will have associated with it a method blank (MB), matrix spike (MS), and a MS duplicate.

Data Validation

Data validation ensures that all collected data are of sufficient quality to be referenced in reports to the RWQCB(s). The information that must be made available to evaluate data validity includes the dates and locations of samples, the laboratory and field QA/QC procedures, the analytical methods used, detection limits of parameter identification, and sample holding time, preservation, and extraction dates. The data validation references that can be utilized include USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review (USEPA 1994) and USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review (USEPA 1999).

Data Qualification

All data collected for compliance with the General Permit will be qualified through the Laboratory QA/QC Process described above. This will ensure that all data has been sufficiently reviewed and qualified as valid. During the validation process, the sample data will be classified as either acceptable (A) or rejected (R). Data classified as A can be used in reports submitted to the RWQCB, whereas data classified as R will not be allowed to be submitted.

Corrective Action

If the criteria for data validation and qualification data are not met, then the following corrective action will be taken:

- The laboratory will need to confirm their QA/QC sample data and calculations. The preserved samples and extracts can be reanalyzed and the subsequent results can then be compared to the previous results. If this process cannot isolate the error, then field equipment calibrations will be reviewed. If the error remains unresolved, then sampling procedures and preparations will be reviewed and verified to be adequate. If samples procedures and preparations appear to be in order, then associated data will be labeled invalid and will not be able to be used.
- If the error source is identified, the appropriate corrective actions will be taken to rectify the problem.

Data Reporting

As described in the Reporting Procedures section in Component 8, all results of sampling and corresponding analysis will be summarized in the Annual Report, and the data will be organized in a manner that is easily discernible. To certify compliance with the requirements of the General Permit, the Annual Report summarizing the past year's activities will be submitted by the City of San Jose to Deputy Director and the appropriate Regional Water Board Executive Officer.

Twenty Four Hour Report

The City of San Jose or maintenance contractor will report to the State Water Board and appropriate Regional Water Board any noncompliance, unexpected effect, or unintended effect of an application that may endanger human health or the environment. In such cases, all essential information will be provided within 24 hours from the time the City of San Jose or maintenance contractor become aware of the conditions and will provide the following information:

- The caller's name and telephone number
- The applicator(s) name(s) and mailing address(es)
- The Waste Discharge Identification (WDID) number
- The name and telephone number of a contact person
- How and when the City of San Jose or maintenance contractor became aware of the noncompliance
- A description of the location where the noncompliance occurred
- A description of the noncompliance and the U.S. EPA pesticide registration number for each product
- A description of any steps that were taken or will take to address and correct any negative effects

If the State and the appropriate Regional Water Board is unable to be notified within 24 hours, the City of San Jose or maintenance contractor will do so as soon as possible and also provide the reason for why notification was unable to be provided within 24 hours.

The City of San Jose or maintenance contractor will also submit a written report within five days from the time of awareness of the noncompliance, which will contain the following information:

- Date and time the City of San Jose or maintenance contractor contacted the State Water Board and Water Board Region 2 notifying the noncompliance, and any instructions that were given by the State and/or Regional Water Board.
- The noncompliance description of the event and its cause, including dates, times, species affected, estimated number and size of dead or distressed non target organisms with exception of the target species.
- The location of incident, name(s) names of water bodies, and the physical appearance of any water bodies affected.
- The scope and magnitude of the area (square feet) or total stream, creek, or river distance affected.
- The intended use of the algaecide and aquatic herbicide, along with the application rate, the method of application, and the name, description, active ingredients, and the U.S. EPA registration number of the algaecide or herbicide product.
- The habitat description, circumstances of the noncompliance, and the ambient characteristics of the water feature.water data for the applied product.
- Any laboratory tests performed, along with the time frame of the tests. A summary of the testing results must also be submitted within five days after becoming available.
- An possible explanation as to why the noncompliance could not have been caused by exposure to the algaecide or aquatic herbicide application;
- Any actions that need to be taken to prevent a recurrence of future incidents or noncompliances.

Component 9: Sample Contamination and Prevention Procedures

- All PPE such as tyvek suits, disposable gloves, and respirators used in the application process will be removed and disposed of in using sealed bags / containers for proper disposal.

- No personnel that perform algaecide and aquatic herbicide applications will be allowed to collect samples.
- Sampler(s) will wash hands and face with soap and clean water.
- New boots and safety glasses will be worn for sampling activities, and the used boots and glasses will be containerized until they are washed and sanitized offsite.
- No sample collection will be carried out within 50 feet of application equipment, and sampling should occur upwind whenever possible.
- No personnel involved with sample collection shall be allowed to come into contact with algaecide or aquatic pesticide application equipment, any pesticide containers, or personal protective equipment (PPE) used by applicators.
- All attempts will be made by sample collectors to avoid contact with any treated water or vegetation.
- All equipment that will be used in more than one sampling location will be thoroughly cleaned and sanitized with a non-phosphate cleaner, triple-rinsed with uncontaminated or distilled water, and rinsed again with water from the new sampling location.
- New PPE and fresh disposable gloves will be worn at each sampling locations.
- All personal decontamination must be done in an area away from any sampling locations.

Component 10: Description of Best Management Practices (BMPs)

The City of San Jose will follow strict best management practices (BMPs) to ensure the safe, efficacious, and efficient applications of algaecides and aquatic herbicides are performed, all of which are described below.

Spill Prevention and Containment

The following spill preventative protocols will be exercised to avoid algaecide and herbicide spillage, and to contain any pesticides in the event of a spill:

- Applicators will exercise the utmost care when mixing and loading algaecides, aquatic herbicides, and any adjuvants.
- All product label instructions and precautions will be followed to ensure the safe loading and handling of all algaecides, aquatic herbicides, and adjuvants.
- All product labels and material safety data sheets (MSDSs) will be reviewed before prior to any treatments and printed copies will be kept on site or within the work vehicle.
- All information on the product labels and MSDS sheets will be followed to insure the proper transportation, handling, and loading of any pesticides used.
- All application equipment will be examined and maintained daily to ensure proper calibration, functionality and to identify and minimize the chances of equipment malfunctions, failures, and the development possible leaks that could lead to a spill.
- All chemicals, mixing equipment, and application equipment will be kept in secondary containers during vehicular transport to prevent any chemical spills from contacting soil or water.
- All pesticide containers and application equipment will be tied down or secured when transporting to prevent them from tipping over or falling from vehicles.
- Whenever possible, algaecides and aquatic herbicides will be mixed and loaded in a contained yard before leaving for the application site(s).
- All algaecide and aquatic herbicide solutions will be mixed and filled into application equipment within secondary containment, such as spill containment trays and collapsible berms.

In the event that any algaecides, aquatic herbicides, or adjuvants are spilled, all practical measures will be implemented to prevent any chemicals from entering and contaminating any waterbodiesfollowing containment protocols will be implemented:

- All personnel associated with any applications of pesticides will be trained in hazardous spill response and containment protocols including but not limited to the control and spread of liquid, liquid absorption, collection and cleanup of contaminated residues, proper disposal of wastes, and the decontamination of the area and any affected equipment.

- All vehicles associated with any applications of pesticides will contain all necessary spill containment materials and equipment including but not limited to kitty litter, containment booms, sorbent socks/pads/pillows, disposable bags, disinfectant cleaner, and fresh PPE contained within a sealed mobile spill kit.
- All spills will be cleaned up and sanitized to completion in accordance with the product label and MSDS instructions using materials from the spill kits to cover and contain the spill area, prevent the spill from spreading, and to soak up the herbicide.
- All used absorbent materials will be cleaned up with brooms and shovels and sealed within the spill kit container.
- All equipment used to clean up and remove spills will be properly contained and disposed of or decontaminated.
- Any spill of pesticides will be reported in accordance to local, state, and federal requirements.

Measures to Ensure Appropriate Use Rate and Proper Application

In the event that a threshold or nuisance level has been or is anticipated to be reached and aquatic herbicides or algaecides are selected as the most appropriate method of control, the following BMPs will be implemented to ensure the appropriate product(s) and application rates are used:

- A PCA in the possession of a current license issued by the California Department of Pesticide Regulation (DPR) will provide an official PCR outlining the appropriate rate of application for the target species, as well as the potential impacts on non-target organisms and the surrounding environment based on their review of the treatment area.
- The written PCR will be in conjunction with all product label information to insure that applications are performed in accordance with California DPR regulations and will include any field application restrictions such as precipitation and wind forecasts or predictions.
- In the event that a product quantity threshold has been reached for an application.
- All personnel applying algaecides and/or aquatic herbicides will have current State of California Department of Pesticide Regulation (DPR) issued Qualified Applicator Licenses, (QAL) Qualified Applicator Certificates, (QAC) or be under the supervision of a licensed applicator.
- All personnel applying algaecides and/or aquatic herbicides will receive annual pesticide training in proper equipment loading, calibration, and operation so that the chances of spills are minimized, precise application rates are made according to the label, and only target plants are treated.

Educating Staff and Herbicide Applicators on How to Avoid Any Potential Adverse Effects From Herbicide Applications

As mentioned above, all applicators will participate in annual pesticide training in accordance to DPR regulations. In addition to application equipment operation, the annual training will include the following safety topics:

- Safety training for fieldworkers and employees working in treated fields
- Emergency medical care
- Decontamination facilities
- Personal protective equipment (PPE)
- Displays of required information
- Current pesticide laws and worker safety regulations

All applicators will be trained by an individual in possession of a current Pest Control Advisor (PCA) or Qualified Applicator (QAL) license issued by the California Department of Pesticide Regulation (DPR). All trainers also undergo required continued education on current pesticide information including pesticide laws, regulations, pest control methods, and product labels and MSDSs outlining the potential adverse effects that can occur from applications with specific pesticides.

Application Coordination to Minimize Potential Impact on Water Users

As required by the algaecide and aquatic herbicide label, All downstream water users that will be potentially affected by any water use restrictions due to algaecide or aquatic herbicide applications will be notified prior to an

application being made. Prior to any application in static waters, the City of San Jose will ensure that the water levels are well below the outflows prior to any to prevent any residues from leaving the lakes whenever possible.

Description of Measures to Prevent Fish Kills

To the extent possible, all aquatic herbicide and algaecide applications will be performed at an action threshold that will prevent a significant amount of algae and plants decomposition that can contribute to oxygen depletion and cause unnecessary fish kills. Dissolved Oxygen (DO) measurements will be taken prior to treatments as part of the MRP, as reduced DO levels can adversely impact fish populations. If DO levels are low, partial treatments may be performed at appropriately spaced time intervals to limit the amount of resulting decomposition of algae and/or plants at a given time, or an alternative method of control will be used. Applicators that will be performed with equipment that is properly calibrated to insure proper treatment rate and distribution so that chemicals are not too highly concentrated in any given area of the treatments. The precautions on product labels to prevent fish kills will be followed, such as limiting the surface water area treated to prevent dead algae or aquatic weeds from accumulating.

As previously discussed in Component 4, all aquatic herbicide and algaecide applications will be made in accordance with the product label instructions and in conjunction with regulations of the local Agricultural Commissioner, U.S. EPA, CalEPA, DPR, and OSHA.

The PCA must scout the treatment area(s) to ensure that any warnings or conditions described on the product labels be accounted for to mitigate the adverse effects on fish and/or other aquatic organisms.

Component 11: Examination of Possible Alternatives

The treatment method of algae and aquatic weeds is decided through the application of Integrated Pest Management (IPM) plan. The IPM plan is an effective and environmentally sensitive approach to pest management that relies on a combination of treatment methods. The City of San Jose will follow an IPM plan to ensure that all pest management strategies focus on long term prevention of aquatic pests, as well as take into account the potential impacts on the environment and beneficial water uses. The plan will use all currently available information on the life cycles of pests and their interaction with the environment in combination with available pest control methods to control/manage pest damage by the most economical means with the least possible hazard to people, property, and the environment. The City of San Jose will insure that all alternative methods will be considered in order to minimize the use of algaecides and aquatic herbicides. If feasible alternative methods do not provide sufficient control, then chemical treatments will be considered.

Action thresholds are met when aquatic weeds or algae cause problems associated with water capacity, flow impediment, sediment build-up, or odor. Under certain circumstances, the decision to use a chemical method of control can be made prior to the exceedance of action thresholds. For example, treating aquatic weed species with herbicides at an earlier growth stage can be the most effective method in controlling a particular pest species. Even though aquatic weeds may not be an immediate problem at this stage, future problems can be predicted and avoided based growth rate and density, weather, water availability, historical records, and experience. This type of early treatment can minimize overall herbicide use by treating small infestations before they spread and mature, thus reducing the amount of herbicide needed than if the plants were allowed to reach mature levels. Treating them before they mature reduces the amount of algaecide and aquatic herbicide needed because the younger aquatic weeds are more susceptible and there is less plant mass to target. The selection of appropriate algaecides and aquatic herbicides and rate of application is done based on the identification of the algae or aquatic weed and the appearance of that algae or aquatic weed on the product label.

No Action

Under the IPM plan, the decision to take no control action will be the first option considered by the City of San Jose, and may be the most feasible option. No action can result in the pest species naturally dying back or dissipating before reaching nuisance levels based on water quality parameters and weather conditions. If the growth of the target species exceeds or is anticipated to reach/exceed the action threshold, other control options will be considered.

Prevention

Early Detection
An early detection of invasive species infestations through regular monitoring of water bodies can enable rapid management responses to remove pests in time to prevent infestations from spreading and becoming further established. Controlling early infestations has a significant economic and environmental advantage over managing extensive infestations, as much fewer resources such as equipment, herbicide, and labor are needed.

Circulation and Aeration
Circulation and aeration are methods of preventative control that mechanically add oxygen directly to the water body. By physically mixing the water column and interspersing the water with surface air, circulation and aeration help to maintain oxygen levels throughout the water column, which potentially decreases the growth and reproduction of nuisance algae by reducing the rate of nutrient recycling into the water.

Beneficial Bacteria
Enzyme solutions and beneficial bacteria have been known to increase the bacterial populations in static water by creating competition with potential pests, which can prevent infestation from reaching action thresholds by limiting the availability of nutrients essential for macrophyte and algal reproduction and growth.

Shading and Dyes
Shading the water column with inert or non-toxic aquatically approved dyes can be used to temporarily reduce unwanted submerged plants and algae by limiting the depth of light penetration within the water column in lagoons, which decreases the light availability that is essential for algae and aquatic plant photosynthesis.

Sediment Removal
In areas where sedimentation has significantly reduced the holding capacity of the water body, sediment removal, or dredging, can increase the water capacity, reduce organic matter generated within the water body, and remove nutrient-rich sediment. The removal of nutrient rich sediments from the benthic zone can reduce the amount of available nutrients for aquatic weeds and algae in the system.

Benthic Barriers and Bottom Screens
Plastic or burlap benthic barriers and bottom screens can be installed and secured to the bottom of a standing water body using soil nails or other fastening devices, which can block out essential light and constrict algae and aquatic plants growing in/on the sediment. Such materials have been proven to be a successful control method, but are expensive and not cost effective for large areas, limiting feasibility to smaller infestations. If they are not regularly inspected and maintained to insure safety and proper performance, sediments can build up on top of the material and provide adequate conditions for algae and aquatic weeds to reestablish. In addition, if not properly anchored they can become damaged or displaced from by activities like fishing, boating, mechanical harvesting and dredging, and/or become a hazard for recreational swimmers and boaters.

Native Species Establishment
The introduction and re-establishment of planting native species has been successful along the banks or margins of rivers and streams. Healthy stands of native plant species has been proven to provide adequate light and nutrient competition for non-desirable species, create desirable native habitats, and can decrease the overall need for long-term management of aquatic weeds. However, the success of this preventative control method is limited to the perimeter of the water bodies such as groundwater recharge ponds and stream channels, as it is not possible within the inner pond area. There are no appropriate submersed aquatic native plants have been demonstrated to establish within ponds to outcompete aquatic weed species without creating similar problems. Therefore, most aquatic vegetation in groundwater recharge ponds should be removed or managed in order to maintain the established aquatic weed density thresholds. Other limiting factors of establishing native plant species as a preventative control option include a general lack in availability of suitable native species, availability of funding and labor to install the plants, and to irrigate and cultivate the native plants until they become established. The native plant characteristics such as growth patterns, their potential to invade areas where they are not desirable, and the timing for the introduction of native plant must be carefully considered.

Mechanical and Physical Methods

Mechanical harvesting and subsequent removal is a viable control method and may involve hand pulling and cutting, raking, weed whipping and mowing, or the use of large motor driven mechanical weed harvesters . Harvested weeds can be left on site if there is not risk of material regrowth or possessing viable seeds, or it can be removed, transferred, and offloaded at a proper disposal site. Materials typically must be taken to traditional landfills instead of green waste as the possibility of redistribution of the material and subsequent re-establishment is a concern.These techniques can be labor intensive per unit acre or length of water treated, and can potentially place personnel at risk of slip, trip or fall hazards, poisonous wildlife, the spilling of motor oil and/or fuel, as well as increasing air pollution. The costs per area of mechanical removal can be significantly higher than the cost of labor, products and equipment associated with the application of algaecide and aquatic herbicides. Under certain circumstances, the selection of mechanical techniques may be necessary when algaecide or aquatic herbicide applications are not practical, or when the phenology or growth stage of target species is not currently appropriate.

Cutting, Hand Pulling, and Mowing
Cutting, hand pulling, weed raking, mowing, and weed whipping can be effective in removing and controlling aquatic plants, especially in smaller scale situations such as eliminating early infestations that have not reached levels where other methods would be more cost effective and efficient. The major drawback of these methods is that they can be labor intensive, slow, and require regular maintenance, which can be more costly with larger areas of infestation, and costs can be compounded if off-hauling and disposal are required.

Mechanical Weed Harvesters
Weed harvesters are larger machines that cut and collect aquatic weeds using cutter bars and conveyor belts at depths of approximately five to ten feet depending on the size of the harvester. Harvested plants are then transferred or offloaded onto the shore where they can be hauled offsite and properly disposed of. Mechanical harvesting is effective in removing aquatic weeds immediately and can quickly treat larger areas. However, the regular maintenance required and the potential need for off-hauling and disposal of vegetation involved in this method can become costly. When selecting the use of mechanical harvesting as a control method, it is important to consider the potential impacts on water quality, fish populations, and the potential to spread invasive plants.

Rotovation
Rotovation is a control method that involves breaking up the substrate by cutting and disturbing the base or submerged portions of aquatic plants using a larger piece of equipment such as a barge equipped with a rototilling head that can be lowered to the bottom of a water body. The rototilling head penetrates the sediment where it can cut and demolish the root system of the plant. It is most effective in larger water bodies that have adequate room for accessing depths. Similar to mechanical harvesters, rotovation is an expensive control option, and costs can be compounded with off-hauling and disposal requirements. It can also adversely impact water quality, fish populations, further spread invasive plants, and release nutrients and contaminants into the water column from sediment disturbance.

Excavating
Excavation is a control method that involves digging out and removing floating, emergent, and submerged aquatic plants as well as the surface sediment that may contain viable invasive material such as vegetation fragments, seeds, stolons, rhizomes, and tubers. This method primarily selected for water bodies with accessible shorelines such as irrigation ditches and canals. As with mechanical harvesting and rotovation, using excavation for weed management can involve costly off-hauling and vegetation and excess sediments, while also causing impacts to water quality, fish populations, the spread of invasive plants, and sediment disturbance issues.

Suction Dredging
Suction dredging is a management method that involves divers manipulating a suction pump attached to a hose equipped with a cutting attachment that pulls, dislodges, and vacuums up unwanted vegetation from the sediment by the root system, passing it up through the hose to a recovery system on the surface. The recovered vegetation is retained and the water and sediment is then discharged back into the water body. Suction dredging is effective on follow up treatments and area at early infestation stages, but has similar drawbacks as the methods mentioned above, as well as being slow and requiring a certified diving team.

Tilling or Discing
This option is not suitable for the control of aquatic or riparian vegetation because tilling or discing exposes erodible soils. The District avoids tilling and discing in and around riparian areas so as not to encourage erosion of banks and sedimentation.

Controlled Burns
Controlled burns are an option that can be most suitable for some species of emergent and terrestrial weeds, but is not practical or appropriate for submerged vegetation due to the potential adverse impact of fires in riparian habitats and residential areas, as well as the creation of air quality concerns.

Analysis of Mechanical Control

While effective in the short-term, mechanical and physical methods may not provide long term control of invasive species due to common regrowth and/or reemergence of the treated vegetation, which necessitates regular maintenance after initial treatments. In addition, the potential environmental impacts that result from the use of mechanical techniques can include the creation of suspended sediments and higher turbidity levels due to the disturbance caused by people and equipment working in and around the water body. Suspended sediment can negatively impact aquatic species by lowering the DO levels and preventing light penetration, as well as creating new areas for aquatic weed establishment through fragmentation of aquatic weeds and seed deposition from increased siltation. There are numerous invasive plant species that can readily regrow from fragmentation, which can spread and start new infestations.

Cultural Methods

Cultural methods can be effectively used to reduce the amount of algaecides and aquatic herbicides used by adapting and altering the application timings to control to prevent plants from reaching reproductive growth stages. Another cultural method is making applications before the density of algae or aquatic vegetation is high enough to require higher algaecide or aquatic herbicide rates or additional applications to maintain algae or aquatic weed populations below threshold levels.

Biological Control Agents

Biological control agents employ a variety of natural mechanisms that are capable of reducing suspended algae in a habitat by selecting and introducing biological organisms such as plants, insects, or animals that are known to have an impact on plant species. As with other management options, the goal of this method is to have the introduced organism reduce the density, growth, reproduction, and survival of the target species. The control species are usually found in the native area of where the aquatic plants originated and are introduced to manipulate the food web structure from the bottom-up or from the top-down. This method typically focuses on increasing existing populations of zooplankton that will consume unwanted algae. Biological control agents can be more effective when used in conjunction with other habitat modifications. However, considerable research must be performed prior to the approval of any species introduction in order to insure that the biological control organisms are host specific and only go after the species of concern. In addition, the regulatory requirements, high costs, and the ultimate uncertainty of success make this method of control impractical in most cases.

Beneficial Bacteria
As discussed in the preventative measures section, enzyme solutions and beneficial bacteria can increase the bacterial populations in static water by creating competition with potential pests, which can prevent infestation from reaching action thresholds by limiting the availability of nutrients essential for macrophyte and algal reproduction and growth.

Grazing
The option of grazing with sheep and goats is often utilized for vegetation control in riparian areas, and has proven to be very effective for terrestrial and emergent invasive weeds. However, the selection of grazing as a control method may not be ideal as the animal activities require fencing and traffic measures, and can cause negative impacts to water quality such as increased bank erosion and turbidity, animal feces contamination, nutrient concentration, and potential adverse impacts on desirable native species. In addition, the cost of hiring grazers is generally higher than the costs associated with selecting a chemical control method.

Algaecides and Aquatic Herbicides

As mentioned previously, the evaluation of alternative control methods is a component in the City of San Jose's IPM approach, which are described in detail in Component 11. In general, the alternative control techniques are usually expensive, labor intensive, pose a high risk of impacting water quality, and may not be as effective as a chemical approach. In addition, the labor and equipment required to utilize these alternative methods is not always readily available during the treatment windows due to increased seasonal maintenance activities performed by the City, which may cause delays in the infestation removal and lead to increased plant material to remove and increased cost.

The City of San Jose in cooperation with the PCA will evaluate the optional control methods, and will provide a PCR that may include one of the methods described above, or a combination of them. If it is decided that preventative and alternative control methods are thoroughly reviewed and deemed to be unfeasible or are impractical, the City of San Jose can include the use of algaecides and/or aquatic herbicides in their IPM plan to control and manage algal blooms and aquatic weed infestations. The City of San Jose has utilized chemical control methods in previous situations to manage nuisance threshold levels of algae and aquatic weeds growth and wants to continue to have them as an optional tool in the IPM plan.

The rates and quantity thresholds of algaecide and aquatic herbicide required for performing applications will be determined by a PCA that has followed the label directions and available research in making a well-informed recommendation. The rates at which algaecides and aquatic herbicides are applied is variable and depends upon the chemical formulation, invasive species density, habitat, location, the goal of the treatment, and time of year of the application. All of these factors must be considered and evaluated by the PCA prior to making a recommendation.

Using the Least Intrusive Method of Aquatic Herbicide Application

The City of San Jose or contracted applicator and PCA will examine and evaluate each treatment area to determine the least intrusive method of algaecide and aquatic herbicide treatments. The selection of the specific application method will be chosen based on the least impact on the surrounding environment, non-target organisms, and human health. All trained applicator(s) will then follow the PCA recommendation, pesticide label(s), and the BMPs and safety measures described in this document to ensure a successful application.

The City of San Jose will employ the use of appropriately outfitted vehicles including but not limited to trucks, all-terrain vehicles, and boats, as well as trained personnel operating calibrated application equipment to perform all algaecide and aquatic herbicide applications. This, in conjunction with safe storage, transport, and mixing protocols will ensure that all aspects of applications will be the least intrusive as feasibly possible. Please refer to Table 1 for herbicides, application methods, and adjuvants.

A Decision Matrix Concept for Choosing the Most Appropriate Chemical Formulation

The City of San Jose or maintenance contractor will rely upon the expertise of the PCA to decide on the most appropriate chemical formulation for the application of any algaecides or aquatic herbicides formulation, and to write a recommendation based on the review of the following factors:

- Invasive and native species present in the treatment area
- Review of product labels and material safety data sheets
- Existing water quality parameters
- The formulation that has the least impact on the surrounding environment, nontarget organism(s), and human health

As previously discussed, the PCA will scout the area(s) to be treated, positively identify all pest(s) present, inspect the appropriate algaecide and aquatic herbicide product label(s), and prepare a written PCR that will provide the best control efficacy. The written PCR may include an adjuvant be added to enhance the efficacy of the algaecide or aquatic herbicide solution. In addition to the product(s) and rate selection, the recommendation will include any warnings or conditions that restrict the application. For example, adjuvants will not be used in any water bodies that are designated as critical habitat for steel head, and surfactants will only be able to be utilized in dry river, stream, or creek beds.

REFERENCES

Blankinship & Associates, Inc., 2018. Glyphosate In Review. Prepared for Midpeninsula Regional Open Space District.
http://www.sanmateorcd.org/wp-content/uploads/2018/08/Glyphosate-Summary-Paper.pdf

California Environmental Protection Agency, 2016. A Compilation of Water Quality Goals 17th Edition. State Water Resource Control Board
https://cawaterlibrary.net/document/a-compilation-of-water-quality-goals/

Clearwater River Watershed Monitoring and Assessment Report
https://www.pca.state.mn.us/sites/default/files/wq-ws3-09020305b.pdf

DPR Compliance Assistance. 2018. Pesticide Safety Training for Employees Handling Pesticides.
https://www.cdpr.ca.gov/docs/enforce/cmpliast/handling_pesticides.pdf

Environmental Protection Agency. 2017. National Functional Guidelines for Inorganic Superfund Methods Data Review.
https://www.epa.gov/sites/production/files/2017-01/documents/national_functional_guidelines_for_inorganic_superfund_methods_data_review_01302017.pdf

Environmental Protection Agency. 2017. National Functional Guidelines for Organic Superfund Methods Data Review.
https://www.epa.gov/sites/production/files/2017-01/documents/national_functional_guidelines_for_organic_superfund_methods_data_review_013072017.pdf

EPA Standard Operating Procedure: Surface Water Sampling PDF
https://www.epa.gov/sites/production/files/2017-07/documents/surface_water_sampling201_af.r4.pdf

GENERAL PERMIT NO. CAG990005

National Environmental Methods Index (NEMI).
http://www.nemi.gov

National Pesticide Information Center. 2, 4D Technical Fact Sheet.
http://npic.orst.edu/factsheets/archive/2,4-DTech.html

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.
http://www.waterboards.ca.gov/water_issues/programs/npdes/docs/aquatic/weedcontrol/wp2013_002dwq.pdf

United States Environmental Protection Agency. 1992. NPDES Storm Water Sampling Guidance Document.
https://www3.epa.gov/npdes/pubs/owm0093.pdf

United States Environmental Protection Agency. 1998. EPA R.E.D Facts: Triclopyr. https://www3.epa.gov/pesticides/chem_search/reg_actions/reregistration/fs_G-82_1-Oct-98.pdf

United States Environmental Protection Agency. 2002. Guidance for Quality Assurance Project Plans. https://www.epa.gov/sites/production/files/2015-06/documents/g5-final.pdf

United States Environmental Protection Agency. 2019. Integrated Pest Management (IPM) Principles https://www.epa.gov/safepestcontrol/integrated-pest-management-ipm-principles

USGS. 2011. Water-Quality Sampling by the U.S. Geological Survey: Standard Protocols and Procedures

Wisconsin Department of Natural Resources. 2012. Imazamox Chemical Fact Sheet. https://dnr.wi.gov/lakes/plants/factsheets/ImazamoxFactsheet.pdf

Wisconsin Department of Natural Resources. 2012. Imazapyr Chemical Fact Sheet. https://dnr.wi.gov/lakes/plants/factsheets/ImazapyrFactsheet.pdf

Wisconsin Department of Natural Resources. 2012. Penoxsulam Chemical Fact Sheet. https://dnr.wi.gov/lakes/plants/factsheets/PenoxsulamFactsheet.pdf

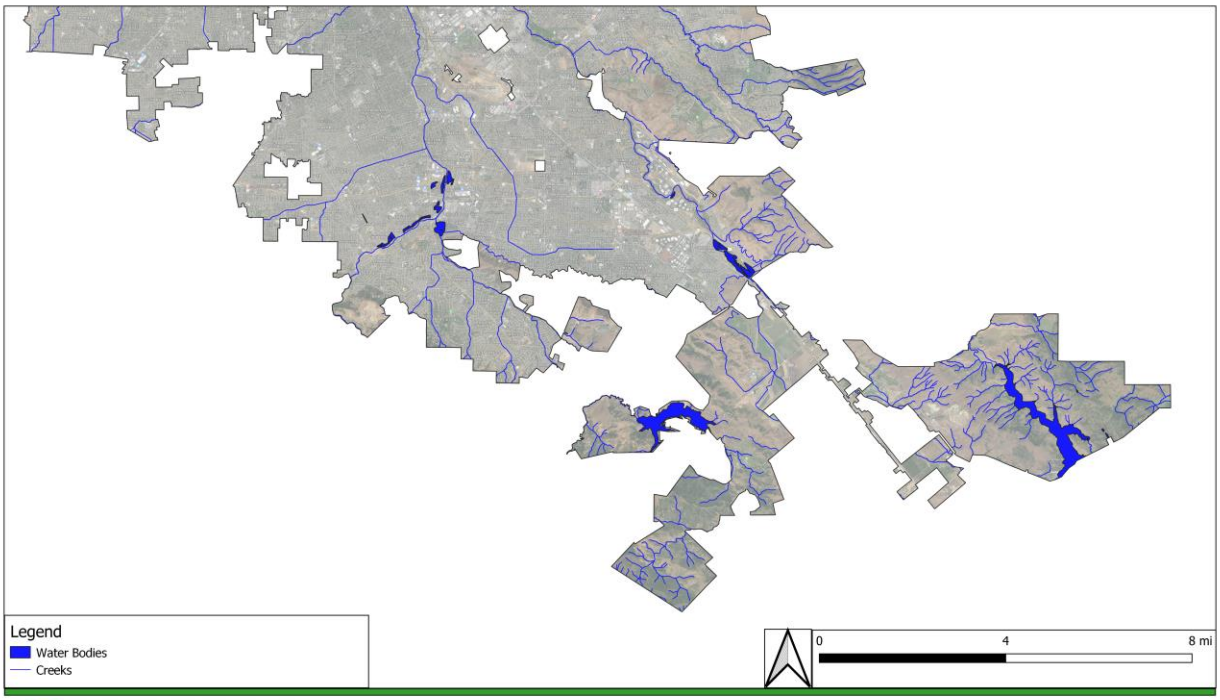
Wisconsin Department of Natural Resources, Dept. of Health Services and Dept. of Agriculture, Trade, and Consumer Protection Frequently Asked Questions about Aquatic Herbicide Use in Wisconsin. 2011. Frequently Asked Questions about Aquatic Herbicide Use in Wisconsin http://dnr.wi.gov/lakes/plants/factsheets/

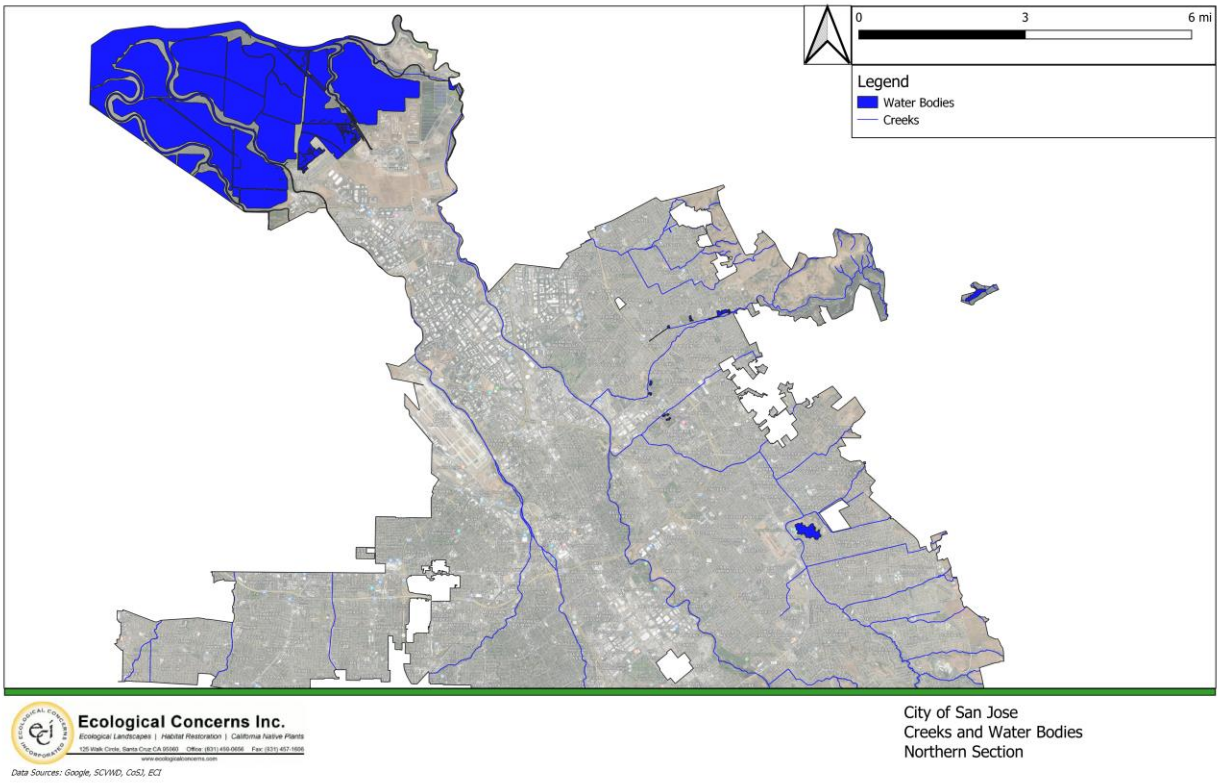
APPENDIX A

Project Overview Maps 1 and 2:

Water Features Within San Jose City Limits

Project Overview Maps 1 and 2:





APPENDIX B

Figure 1 – Aquatic Herbicide Application Log

Figure 2 – Aquatic Herbicide Field Monitoring and Sampling Form (Moving Water)

Figure 3 – Aquatic Herbicide Field Monitoring and Sampling Form (Static Water)

AQUATIC HERBICIDE APPLICATION LOG – FIGURE 1

To be filled out with every algaecide or aquatic herbicide application

Date _____ Location _____ Start Time _____ Stop Time _____
Agency _____ Personnel _____
Weather: Temperature _____ Precipitation % _____ Wind Speed (mph) _____ Cloud Cover % _____
If no applications were made this month check here _____ and list month _____

Algaecide and Aquatic Herbicide Information:

Herbicide Used #1 _____ Rate / Concentration _____ Amount Applied _____
Herbicide Used #2 _____ Rate / Concentration _____ Amount Applied _____
Adjuvant Used #1 _____ Rate / Concentration _____ Amount Applied _____
Adjuvant Used #2 _____ Rate / Concentration _____ Amount Applied _____
Application Method _____ Application made **With / Against / NA** - water flow (circle)

Water Body Information:

Water Body Type - **Lake / Reservoir / Pond / Creek / Lined Canal / Unlined Canal / Ditch / Drain / Other**
Water Flow (feet/second) _____ Water Depth (feet) _____ Water Temperature (F) _____.
Water Color _____ Water Sheen - **Yes / No** Water Clarity – **Poor / Fair / Good**
Other Water Information _____.
Target Weed % _____ Weed Distribution - **Dense / Scattered** Weed Phenology – **Immature / Mature**

Efficacy and Impact of Application:

Treatment Efficacy – **None / Low / Good / Excellent / Unknown**
Impacts To Water Quality – **None / Low / Moderate / Significant / Unknown**
Other Information _____.

Gates / Weirs / Check Valves / Other Control Structures In Treatment Area:

Are there gates / weirs / valves / other control structures that may discharge to streams, rivers, lakes, or other natural waterways ? **Yes / No / NA**

- **If Yes, fill out the following:**

Prior to application –

Have flow control structures been closed / sealed to prevent discharge to waterways? **Yes / No**
Have flow control structures been inspected for leaks ? **Yes / No**
If leaks were found, have they been sealed / diverted / prevented to avoid discharge to waterways prior to application? **Yes / No**

During Application –

Were flow control structures re-inspected and confirmed to have no leaks? **Yes / No**
If any leaks developed during the the application, was the treatment stopped until the leak could be sealed or prevented from allowing discharge to waterways? **Yes / No**

- If answer is **No**, provide explanation _____

Applicable Gate Name/Number _____ Time closed _____ Time opened _____
Applicable Gate Name/Number _____ Time closed _____ Time opened _____
Applicable Gate Name/Number _____ Time closed _____ Time opened _____
Reason for determining gate reopening time _____

I_____certify that the APAP has been followed X_____
(print name) (sign here)

AQUATIC HERBICIDE FIELD MONITORING AND SAMPLING FORM – FIGURE 2 (MOVING WATER)

Attach corresponding Aquatic Herbicide Application Log

Agency: _____ Site Name: _____

Application Monitoring Area Location _____.

Herbicide Products Used _____.

Background Monitoring (BG) Sample #1 - collect upstream of treatment area or within treatment area up to 24 hours prior to application.

Sampler Name: _____ Date: _____ Time: _____ GPS Coordinates: _____

Water Speed (feet/second) _____ DO (mg/L) _____ EC (µs/cm) _____

pH _____ Temperature (F) _____ Turbidity (NTU) _____

Target Vegetation _____

Site Description _____

Observations –

Floating Material **Yes / No / Unknown** Description of Observations _____

Suspended Material **Yes / No / Unknown** Description of Observations _____

Bottom Deposits **Yes / No / Unknown** Description of Observations _____

Odors / Tastes **Yes / No / Unknown** Description of Observations _____

Water Coloration **Yes / No / Unknown** Description of Observations _____

Aquatic Life **Yes / No / Unknown** Description of Observations

Event Monitoring (Event) Sample #2 - collect immediately downstream of treatment area after sufficient time has elapsed since the application.

Sampler Name: _____ Date: _____ Time: _____ GPS Coordinates: _____

Water Speed (feet/second) _____ DO (mg/L) _____ EC (µs/cm) _____

pH _____ Temperature (F) _____ Turbidity (NTU) _____

Length of Treated Area _____ Was Application Made Against Water Flow? **Yes** or **No**

Application Start Date: _____ Start Time: _____ Application End Date: _____ End Time: _____

Observations –

Floating Material **Yes / No / Unknown** Description of Observations _____

Suspended Material **Yes / No / Unknown** Description of Observations _____

Bottom Deposits **Yes / No / Unknown** Description of Observations _____

Odors / Tastes **Yes / No / Unknown** Description of Observations _____

Water Coloration **Yes / No / Unknown** Description of Observations _____

Aquatic Life **Yes / No / Unknown** Description of Observations _____

Post - Event Monitoring (Post) Sample #3- Collect in treatment area within 7 days of application.

Sampler Name: _____ Date: _____ Time: _____ GPS Coordinates: _____

Water Speed (feet/second) _____ DO (mg/L) _____ EC (µs/cm) _____

pH _____ Temperature (F) _____ Turbidity (NTU) _____

Length of Treated Area _____ Was Application Made Against Water Flow? **Yes** or **No**

Application Start Date: _____ Start Time: _____ Application End Date: _____ End Time: _____

Post Treatment Efficacy: **None / Poor / Fair / Good / Excellent / Unknown**

Impacts to Water Quality: **Positive / Negative / Unknown**

Other Information: _____

Observations –

Floating Material **Yes / No / Unknown** Description of Observations _____

Suspended Material **Yes / No / Unknown** Description of Observations _____

Bottom Deposits **Yes / No / Unknown** Description of Observations _____

Odors / Tastes **Yes / No / Unknown** Description of Observations _____

Water Coloration **Yes / No / Unknown** Description of Observations _____

Aquatic Life **Yes / No / Unknown** Description of Observations _____

Description of Impact on Aquatic Life: _____

Date Field Blank (FB) Collected: _____ **Date Field Duplicate Collected:** _____

Sample	Date and Time Samples, COC, and Cooler Shipped To Lab	Method of Shipment
Background		
Event		
FB and FD		
Post		

AQUATIC HERBICIDE FIELD MONITORING AND SAMPLING FORM – FIGURE 3 (STATIC WATER)

Attach corresponding Aquatic Herbicide Application Log

Agency: _____ Site Name: _____

Application Monitoring Area Location _____.

Herbicide Products Used _____.

Background Monitoring (BG) Sample #1 - collect upstream of treatment area or within treatment area up to 24 hours prior to application.

Sampler Name: _____ Date: _____ Time: _____ GPS Coordinates: _____

Water Speed (feet/second) _____ DO (mg/L) _____ EC (µs/cm) _____

pH _____ Temperature (F) _____ Turbidity (NTU) _____

Target Vegetation _____

Site Description _____

Observations –

Floating Material	**Yes / No / Unknown**	Description of Observations _____
Suspended Material	**Yes / No / Unknown**	Description of Observations _____
Bottom Deposits	**Yes / No / Unknown**	Description of Observations _____
Odors / Tastes	**Yes / No / Unknown**	Description of Observations _____
Water Coloration	**Yes / No / Unknown**	Description of Observations _____
Aquatic Life	**Yes / No / Unknown**	Description of Observations _____

Event Monitoring (Event) Sample #2 - collect immediately downstream of treatment area after sufficient time has elapsed since the application.

Sampler Name: _____ Date: _____ Time: _____ GPS Coordinates: _____

Water Speed (feet/second) _____ DO (mg/L) _____ EC (µs/cm) _____

pH _____ Temperature (F) _____ Turbidity (NTU) _____

Length of Treated Area _____ Was Application Made Against Water Flow? **Yes** or **No**

Application Start Date: _____ Start Time: _____ Application End Date: _____ End Time: _____

Observations –

Floating Material	**Yes / No / Unknown**	Description of Observations _____
Suspended Material	**Yes / No / Unknown**	Description of Observations _____
Bottom Deposits	**Yes / No / Unknown**	Description of Observations _____
Odors / Tastes	**Yes / No / Unknown**	Description of Observations _____
Water Coloration	**Yes / No / Unknown**	Description of Observations _____
Aquatic Life	**Yes / No / Unknown**	Description of Observations _____

Post - Event Monitoring (Post) Sample #3- Collect in treatment area within 7 days of application.

Sampler Name: _____ Date: _____ Time: _____ GPS Coordinates: _____

Water Speed (feet/second) _____ DO (mg/L) _____ EC (µs/cm) _____

pH _____ Temperature (F) _____ Turbidity (NTU) _____

Length of Treated Area _____ Was Application Made Against Water Flow? **Yes** or **No**

Application Start Date: _____ Start Time: _____ Application End Date: _____ End Time: _____

Post Treatment Efficacy: **None / Poor / Fair / Good / Excellent / Unknown**

Impacts to Water Quality: **Positive / Negative / Unknown**

Other Information: _____

Observations –

Floating Material **Yes / No / Unknown** Description of Observations _____

Suspended Material **Yes / No / Unknown** Description of Observations _____

Bottom Deposits **Yes / No / Unknown** Description of Observations _____

Odors / Tastes **Yes / No / Unknown** Description of Observations _____

Water Coloration **Yes / No / Unknown** Description of Observations _____

Aquatic Life **Yes / No / Unknown** Description of Observations _____

Description of Impact on Aquatic Life: _____

Date Field Blank (FB) Collected: _____ **Date Field Duplicate Collected:** _____

Sample	Date and Time Samples, COC, and Cooler Shipped To Lab	Method of Shipment
Background		
Event		
FB and FD		
Post		