MINASIAN, SPRUANCE, BABER, MEITH, SOARES & SEXTON, LLP

ATTORNEYS

A Partnership Including Professional Corporations

1681 Bird Street
P.O. Box 1679
Oroville, CA 95965-1679

Writer's E-MAIL: msexton@minasianlaw.com

PAUL R. MINASIAN, INC.
WILLIAM H. SPRUANCE, INC.
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(530) 533-2885

FACSIMILE:
(530) 533-0197

January 9, 2004

Stanley M. Martinson, Chief
State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, CA 95812-0100

Re: Nevada Irrigation District Request for Administrative Extension of Statewide General Permit No. CAG 9900 03, Aquatic Pesticides General Permit

Dear Mr. Martinson:

Nevada Irrigation District ("NID" or "the District") requests that General Permit No. CAG 990003, Aquatic Pesticides General Permit, issued to NID on September 10, 2001, be administratively extended beyond its current expiration date of January 31, 2004. This request is made pursuant to Title 23 California Code of Regulations Section 2235.4 "Continuation of Expired Permits" which provides that "the terms and conditions of an expired permit are automatically continued pending issuance of a new permit if all requirements of the federal NPDES regulations on continuation of expired permits are complied with."

We understand that the State Water Resources Control Board is working on the development of a new statewide general permit for the application of aquatic pesticides. In the event that the State Water Resources Control Board is prepared to seek from districts such as NID notice of intent to comply with the terms of the new statewide permit, then NID, by this letter, gives such notice of intent.

Water quality standards for receiving waters that may be affected by the application of aquatic pesticides are generally established by the California Toxics Rule (CTR). NID believes that its Mitigation Monitoring Plan, Monitoring and Reporting Plan, and Quality Assurance

Project Plan, which outline the District's aquatic pesticide application and monitoring protocol, will result in NID meeting water quality standards for receiving waters; however, in the unlikely event that a water quality exceedance does occur, NID requests a categorical exception to the CTR pursuant to the Surface/Inland Waters Plan (SIP) based upon the analysis in the attached Initial Study and Notice of Intent to Adopt a Mitigated Negative Declaration. The District has scheduled a public hearing on its Aquatic Weed Management Program on January 28, 2004. The newspaper notice of this hearing is also attached. We believe that the NID board of directors will likely approve and adopt the Mitigated Negative Declaration on January 28th, and the District's Notice of Determination will be immediately transmitted to your office.

Additional documents that support the District's application for a categorical exception to the SIP are included in the Initial Study and Notice of Intent document. They include the District's: (1) Mitigation Monitoring Plan for the Aquatic Weed Management Program; (2) Aquatic Herbicide Monitoring and Reporting Plan, dated January 17, 2002; and, (3) Quality Assurance Project Plan for the Aquatic Herbicide Monitoring and Reporting Plan, dated January 17, 2002.

Please let me know if you agree that NID has fully complied with the application rquirements for a new aquatic pesticides general permit, including a request for a categorical exception.

Very truly yours,

MINASIAN, SPRUANCE, BABER, MEITH, SOARES & SEXTON, LLP.

By: _____
MICHAEL V. SEXTON

MVS:aw

Encls. Initial Study and Notice of Intent to Adopt a Mitigated Negative Declaration
Mitigation Monitoring Plan
Monitoring and Reporting Plan
Quality Assurance Project Plan

cc: Ron Nelson and Robin Lantz, Nevada Irrigation District
Elizabeth Miller Jennings, Counsel, SWRCB
Emily Alejandro, Region 5 Water Quality Control Board

Yuba, Placer and Nevada Counties. Consequently, attached for your files is a Notice of Determination filed in Yuba County January 28, 2004; Notice of Determination filed in Placer County January 28, 2004; and Notice of Determination filed in Nevada County on January 28, 2004. Additionally, please find enclosed the California Department of Fish & Game Certificate of Fee Exemption (*de minimus* impact finding) filed with the Board January 28, 2004, and the NID Aquatic Weed Management Program Mitigation Monitoring Plan adopted by the Board January 28, 2004.

Based upon the foregoing, NID believes that it has fully complied with the application requirements for new aquatic pesticide general permit including a request for a categorical exception to the CTR pursuant to the Surface Inland Waters Plan. Please let us know you concur and that you have administratively extended General Permit No. CAG 9900 03 until the State's new NPDES statewide permit for application of aquatic pesticides is issued.

Following the public hearing at NID January 28, 2004, the Board confirmed that the District will comply with and adhere to the mitigation measures listed on Exhibit "H" attached to the CEQA Initial Study and Notice of Intent to Adopt a Mitigated Negative Declaration dated December 10, 2003, along with the Mitigation Monitoring Plan adopted by the Board following the public hearing.

Very truly yours,

MINASIAN, SPRUANCE, BABER, MEITH, SOARES & SEXTON, LLP.

By: _____
MICHAEL V. SEXTON

MVS:aw
Enclosures:
Notice of Determination filed in Yuba County
Notice of Determination filed in Placer County
Notice of Determination filed in Nevada County
California Department of Fish & Game Certificate of Fee Exemption
NID Aquatic Weed Management Program Mitigation Monitoring Plan

cc: Ron Nelson and Robin Lantz, Nevada Irrigation District (without enclosures)
Elizabeth Miller Jennings, Counsel, SWRCB (with enclosures)
Emily Alejandro, Region 5 Water Quality Control Board (with enclosures)

S:\All Districts\NPDES Permit\Nevada Irrigation District\Martinson transmitting Mitigated Negative Declaration adopted 1-28-04.wpd

MINASIAN, SPRUANCE, BABER, MEITH, SOARES & SEXTON, LLP

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January 29, 2004

Stanley M. Martinson, Chief
State Water Resources Control Board
Division of Water Quality
P.O. Box 100
Sacramento, CA 95812-0100

Re: ***Nevada Irrigation District Request for Administrative Extension of Statewide General Permit No. CAG 9900 03, Aquatic Pesticides General Permit***

Dear Mr. Martinson:

On January 9, 2004, Nevada Irrigation District ("NID" or "the District") requested that General Permit No. CAG 9900 03, Aquatic Pesticides General Permit, issued to NID on December 10, 2001, be administratively extended beyond its current expiration date of January 31, 2004.

The District also requested a categorical exception to the CTR pursuant to the Surface Inland Waters Plan based upon the analysis in the District's Initial Study and Notice of Intent to Adopt a Mitigated Negative Declaration, copies of which were provided attached to the January 9, 2004 letter. We advised you at that time that the District had scheduled a public hearing on its aquatic weed management program on January 28, 2004.

The District also transmitted copies of its (1) Mitigation Monitoring Plan for the Aquatic Weed Management Program; (2) Aquatic Herbicide Monitoring and Reporting Plan dated January 17, 2002; and (3) Quality Assurance Project Plan for the Aquatic Herbicide Monitoring and Reporting Plan dated January 17, 2002.

The District conducted a public hearing on its aquatic weed management program on January 28, 2004 as scheduled, and at that time, the Board of Directors adopted the Mitigated Negative Declaration. As you may know, Nevada Irrigation District service area encompasses

EXHIBIT H

FILED
LORRAINE JEWETT-BURDICK,
RECORDER

2004 JAN 28 PM 2:41

RP
DEPUTY

2004-007

NOTICE OF DETERMINATION

To: County Clerk
County of Nevada
950 Maidu Avenue
Nevada City, CA 95959

OR

To: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

From: Nevada Irrigation District
PO Box 1019
Grass Valley, CA 95945

SUBJECT: Filing of Notice of Determination in Compliance with Section 21108 or 21152 of the Public Resources Code.

AQUATIC WEED MANAGEMENT PROGRAM
PROJECT TITLE

State Clearinghouse Number (if submitted to State Clearinghouse)

Robin Lantz, Maintenance Manager
CONTACT PERSON

(530) 273-6185
Area Code Phone Ext.

PROJECT LOCATION: District canals located in Nevada, Placer and Yuba counties.

PROJECT DESCRIPTION: This program involves the application of herbicides into District canals to remove unwanted vegetation, which can impede water flow if left unchecked.

This is to advise that the NEVADA IRRIGATION DISTRICT approved the above-described project on January 28, 2004, after complying with CEQA, and has made the following determinations regarding the above-described project:

1. The project ☐ will ☒ will not have a significant effect on the environment.

2. ☐ An Environmental Impact Report was prepared for this project pursuant to the provisions of CEQA.

   ☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.

The EIR or Negative Declaration and record of project approval may be examined at the District's office at 1036 West Main Street, Grass Valley, California.

3. Mitigation measures ☒ were, ☐ were not, made a condition of the approval of the project.

4. A Statement of Overriding Considerations ☐ was, ☐ was not, adopted for this project.

1-28-04
Date

Ron Nelson, General Manager
Nevada Irrigation District

THE FOREGOING INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE

ATTEST
JAN 28 2004
S. CAROL GATES
SECRETARY OF THE BOARD OF DIRECTORS
NEVADA IRRIGATION DISTRICT

EXHIBIT H

FILED

JAN 28 2004

Jim McCauley
COUNTY CLERK OF PLACER COUNTY
BY D L Hedman
DEPUTY

JAN 30 2004

NOTICE OF DETERMINATION

To: County Clerk
County of Placer
2956 Richardson Drive
Auburn, CA 95603

OR

To: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

From: Nevada Irrigation District
PO Box 1019
Grass Valley, CA 95945

SUBJECT: Filing of Notice of Determination in Compliance with Section 21108 or 21152 of the Public Resources Code.

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   ☒ A Negative Declaration was prepared for this project pursuant to the provisions of CEQA.

POSTED JAN 28 2004
through
JIM McCAULEY, COUNTY CLERK
By D L Hedman
Deputy Clerk

#2041

The EIR or Negative Declaration and record of project approval may be examined at the District's office at 1036 West Main Street, Grass Valley, California.

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4. A Statement of Overriding Considerations ☐ was, ☐ was not, adopted for this project.

1-28-04
Date

Ron Nelson, General Manager
Nevada Irrigation District

EXHIBIT H

ENDORSED FILED

JAN 2 8 2004

TERRY A. HANSEN, County Clerk
BY _____ Deputy

NOTICE OF DETERMINATION

To: County Clerk
County of Yuba
935 14th Street
Marysville, CA 95901

OR

To: Office of Planning and Research
1400 Tenth Street
Sacramento, CA 95814

From: Nevada Irrigation District
PO Box 1019
Grass Valley, CA 95945

SUBJECT: Filing of Notice of Determination in Compliance with Section 21108 or 21152 of the Public Resources Code.

AQUATIC WEED MANAGEMENT PROGRAM
PROJECT TITLE

State Clearinghouse Number (if submitted to State Clearinghouse)

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The EIR or Negative Declaration and record of project approval may be examined at the District's office at 1036 West Main Street, Grass Valley, California.

3. Mitigation measures ☒ were, ☐ were not, made a condition of the approval of the project.

4. A Statement of Overriding Considerations ☐ was, ☐ was not, adopted for this project.

1-28-04
Date

Ron Nelson, General Manager
Nevada Irrigation District

THE FOREGOING INSTRUMENT IS A CORRECT COPY OF THE ORIGINAL ON FILE IN THIS OFFICE

ATTEST JAN 28 2004

S. CAROL GATES
SECRETARY OF THE BOARD OF DIRECTORS
NEVADA IRRIGATION DISTRICT

EXHIBIT "L"

CALIFORNIA DEPARTMENT OF FISH AND GAME
CERTIFICATE OF FEE EXEMPTION
DeMinimus Impact Finding

Project Title/Location Name and Address of Project Proponent (include county):

AQUATIC WEED MANAGEMENT PROGRAM

Nevada Irrigation District, PO Box 1019, Grass Valley, CA 95945-1019, Nevada County

Project Description: This program involves the application of herbicides into District canals to remove unwanted vegetation, which can impede water flow if left unchecked.

Findings of Exemption (attach required findings):

See attached.

Certification:

I hereby certify that the lead agency has made the above findings of fact and that, based upon the initial study and hearing record, the project will not individually or cumulatively have an adverse effect on wildlife resources as defined in Section 711.2 of the Fish and Game Code.

Dave Steb
(Chief Planning Official)

Title Gen. Mgr.

Nevada Irrigation District

Date 1-28-04

THE FOREGOING INSTRUMENT IS A
CORRECT COPY OF THE ORIGINAL
ON FILE IN THIS OFFICE

ATTEST
JAN 28 2004
A. Carol Gates
S. CAROL GATES
SECRETARY OF THE BOARD OF DIRECTORS
NEVADA IRRIGATION DISTRICT

Attachment to Exhibit "L"

FINDINGS OF EXEMPTION

ENVIRONMENTAL IMPACT STUDY:

☐ The Initial Study conducted by the District evaluated the potential for adverse environmental impact and found no evidence, considering the record as a whole, that the proposed project will result in changes to the resources listed below: (14 C.C.R. 753.5(d)

a. Riparian land, rivers, streams, watercourses, and wetlands under state and federal jurisdiction.

b. Native and nonnative plant life and soil required to sustain habitat for fish and wildlife;

c. Rare and unique plant life and ecological communities dependent on plant life, and

d. Listed threatened and endangered plants and animals and the habitat in which they are believed to reside.

e. All species of plants or animals as listed as protected or identified for special management in the Fish & Game Code, the Public Resources Code, the Water Code, or regulations adopted thereunder.

f. All marine and terrestrial species subject to the jurisdiction of the Department of Fish & Game and the ecological communities in which they reside.

g. All air and water resources, the degradation of which will individually or cumulatively result in a loss of biological diversity among the plants and animals residing in that air and water.

☐ In addition, District has considered the following items to determine whether the project is or is not *DeMinimis*:

a. Department of Fish and Game has not concluded that the project is subject to the filing fee.

b. Habitat types present on the project site.

c. Habitat types adjacent to the project site.

d. Cumulative impacts of this and similar projects on existing fish or wildlife habitat.

e. Project impacts on the natural and biological resources of the community.

Distribution:

Once signed by the Chief Planning Official, District retains original as part of the Environmental Record. File two copies of certificate with the County Clerk along with the Notice of Approval or Notice of Determination.

Nevada Irrigation District
Aquatic Weed Management Program
Mitigation Monitoring Plan

	Conditions of Approval / Mitigation Measure	Timing / Implementation	Enforcement / Monitoring
Biological Resources			
1.	**California Red-Legged Frog (*Rana aurora draytonii*) and Foothill Yellow-Legged Frog (*Rana boylii*)** California red-legged frog (*Rana aurora draytonii*) is endemic to California and Baja California, Mexico. CRLF are federally listed as threatened and are a state species of concern. They utilize a variety of habitats including various aquatic, riparian, and upland habitats below 5,200 feet (Jennings & Hayes, 1994); nearly all sightings have occurred below 3,500 feet (USFWS, 2002). Although the use of upland habitats by CRLF is not well understood, during periods of wet weather, this species is known to make movements through upland habitats (USFWS, 2002). CRLF rarely occur far from water during dry periods. Deep (greater than 2 feet) still or slow moving water and dense, shrubby riparian or emergent vegetation is necessary for the deposition of eggs (USFWS, 2002). Foothill yellow-legged frogs (*Rana boylii*) are federal species of concern and state species of	Pre-application surveys will be conducted in those areas most likely to have occurrences of either the California Red-Legged Frog or Foothill Yellow-Legged Frog. These surveys will be conducted prior to the application of any herbicides into canals or waterways operated by Nevada Irrigation District (NID) to determine the presence/absence of either species. In the event that either frog species is observed in area, no herbicide applications will take place.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.

	concern that inhabit perennial streams with cobble substrate. FYLF may possibly occur in the waterways within the affected environment.		
2.	Northwestern Pond Turtle (*Clemmys marmorata marmorata*) The western pond turtle (*Clemmys marmorata*) occurs from the vicinity of the American River in California northward to the lower Columbia River in Oregon and Washington. Northwestern pond turtles are habitat generalists and occur in a wide variety of permanent or nearly permanent aquatic habitats, normally ponds, lakes, streams and irrigation ditches, with basking sites such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks (Zeiner et al., 1988). Aquatic sites are usually left to reproduce, aestivate, and overwinter in upland habitats such as annual grasslands and oak woodlands (Jennings & Hayes 1994).	Pre-application surveys will be implemented in those areas most likely to have occurrences of NW pond turtles. To reduce direct impacts to NW pond turtles, herbicides will not be used in those areas of occurrence.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.
3.	**Listed and Special-Status Fish Species** Chinook and steelhead are salmonids found in some tributaries of the Sacramento and American Rivers. They may occasionally occur in canal systems to which they have	Pre-application surveys will be implemented in those areas most likely to have occurrences of salmonids. To reduce direct impacts to salmonids,	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.

	access, and potentially be affected by herbicide levels in those canals systems.	herbicides will not be used in those areas of occurrence. In canals where acrolein is used the waters will held for a minimum of 6 days prior to release into natural waterways. Acrolein treated water may be released sooner for agricultural irrigation as long as it does not intercept natural waterways.	
4.	**Listed and Special-Status Invertebrate Species** Valley elderberry longhorn beetle may occur in riparian areas in their host plant, *Sambucus mexicanus*.	Elderberry shrubs located in the vicinity of canals that receive herbicide applications will be inventoried and mapped. No glyphosate will be used within 50 feet of these shrub locations.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.
Hydrology and Water Quality			
5.	NID's goal is to adhere to the water quality standards and discharge requirements of the CWA as they pertain to herbicide applications into the waters of the United States. Proposed activities of this project have the potential to violate these requirements if the recommended label requirements are not strictly adhered to Herbicides will only be applied by licensed	Continuous throughout the life of the Aquatic Weed Management Program.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.

	applicators in a manner consistent with the label requirements.		
6.	Discharges of waters treated with herbicides to natural stream systems will be avoided where possible and otherwise minimized. Canals treated with acrolein will be held for a minimum of 6 day prior to being released into natural water bodies. Acrolein treated water may be released sooner if released directly for agricultural irrigation and will not intercept natural waterways.	Continuous throughout the life of the Aquatic Weed Management Program.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.
7.	Ambient levels of alkalinity will be monitored and the application rates (and resultant concentrations of herbicides that contain copper) will be decreased to minimize potential toxic impacts. When the receiving natural waterbody flows are low, calcium carbonate ($CaCO_3$) will be added to the water prior to discharge.	Alkalinity data will be collected prior to all copper based herbicide applications. When receiving waterbody flows are low, calcium carbonate will be added to the discharged water. This will raise the existing alkalinity in the treated water and reduce the toxicity of the copper in the receiving waters to a less than significant level.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.
8.	The minimum effective amounts of herbicides will be applied to minimize potential water quality impacts.	A survey of aquatic weed density will be conducted prior to applications of aquatic herbicide applications to determine minimum concentration needed to control vegetation.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.

9.	Discharges of waters treated with sulfate compounds to natural waterways will be avoided. This will prevent the loading of sulfate to waterways with sediments contaminated with mercury.	Continuous throughout the life of the Aquatic Weed Management Program.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.
10.	Discharges of waters treated with herbicides to water treatment plants will be avoided.	Continuous throughout the life of the Aquatic Weed Management Program.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.

EXHIBIT "L"

CALIFORNIA DEPARTMENT OF FISH AND GAME
CERTIFICATE OF FEE EXEMPTION
DeMinimus Impact Finding

Project Title/Location Name and Address of Project Proponent (include county):

AQUATIC WEED MANAGEMENT PROGRAM

Nevada Irrigation District, PO Box 1019, Grass Valley, CA 95945-1019, Nevada County

Project Description: This program involves the application of herbicides into District canals to remove unwanted vegetation, which can impede water flow if left unchecked.

Findings of Exemption (attach required findings):

See attached.

Certification:

I hereby certify that the lead agency has made the above findings of fact and that, based upon the initial study and hearing record, the project will not individually or cumulatively have an adverse effect on wildlife resources as defined in Section 711.2 of the Fish and Game Code.

Steve Lieb
(Chief Planning Official)

Title Gen. Mgr.

Nevada Irrigation District

Date 1-28-04

Attachment to Exhibit "L"

FINDINGS OF EXEMPTION

ENVIRONMENTAL IMPACT STUDY:

☐ The Initial Study conducted by the District evaluated the potential for adverse environmental impact and found no evidence, considering the record as a whole, that the proposed project will result in changes to the resources listed below: (14 C.C.R. 753.5(d)

a. Riparian land, rivers, streams, watercourses, and wetlands under state and federal jurisdiction.

b. Native and nonnative plant life and soil required to sustain habitat for fish and wildlife;

c. Rare and unique plant life and ecological communities dependent on plant life, and

d. Listed threatened and endangered plants and animals and the habitat in which they are believed to reside.

e. All species of plants or animals as listed as protected or identified for special management in the Fish & Game Code, the Public Resources Code, the Water Code, or regulations adopted thereunder.

f. All marine and terrestrial species subject to the jurisdiction of the Department of Fish & Game and the ecological communities in which they reside.

g. All air and water resources, the degradation of which will individually or cumulatively result in a loss of biological diversity among the plants and animals residing in that air and water.

☐ In addition, District has considered the following items to determine whether the project is or is not *DeMinimis*:

a. Department of Fish and Game has not concluded that the project is subject to the filing fee.

b. Habitat types present on the project site.

c. Habitat types adjacent to the project site.

d. Cumulative impacts of this and similar projects on existing fish or wildlife habitat.

e. Project impacts on the natural and biological resources of the community.

Distribution:

Once signed by the Chief Planning Official, District retains original as part of the Environmental Record. File two copies of certificate with the County Clerk along with the Notice of Approval or Notice of Determination.

NEVADA IRRIGATION DISTRICT
AQUATIC WEED MANAGEMENT PROGRAM

CEQA INITIAL STUDY AND NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

December 10, 2003

Submitted by:

FOOTHILL ASSOCIATES

NEVADA IRRIGATION DISTRICT
AQUATIC WEED MANAGEMENT PROGRAM

CEQA INITIAL STUDY AND NOTICE OF INTENT TO ADOPT A MITIGATED NEGATIVE DECLARATION

December 10, 2003

Submitted by:

FOOTHILL ASSOCIATES

Table of Contents

List of Tables and Figures

APPENDICES

1.0 INTRODUCTION

1.1 Introduction and Regulatory Guidance

This document is an Initial Study that provides justification for a Mitigated Negative Declaration (MND) for the Nevada Irrigation District, Aquatic Weed Management Program. The Aquatic Weed Management Program involves the application of herbicides into their canals in order to remove unwanted vegetation, which can impede water flow if left unchecked. This MND has been prepared in accordance with the California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., and the State CEQA Guidelines, 14 California Code of Regulations (CCR) Section 15000 et seq.

An Initial Study is conducted by a Lead Agency to determine if a project may have a significant effect on the environment (CEQA Guidelines Section 15063). An EIR must be prepared if an Initial Study indicates that the proposed project under review may have a significant impact on the environment. A Negative Declaration may be prepared instead, if the Lead Agency prepares a written statement describing the reasons why a proposed project would not have a significant effect on the environment, and therefore does not require the preparation of an EIR. According to CEQA Guidelines Section 15070, a Negative Declaration shall be prepared for a project subject to CEQA when either:

a) The Initial Study shows that there is no substantial evidence, in light of the whole record before the agency, that the proposed project may have a significant effect on the environment, or

b) The Initial Study identifies potentially significant effects, but:

(1) Revisions in the project plans or proposals made by or agreed to by the applicant before the proposed negative declaration is released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effects would occur, and

(2) There is no substantial evidence, in light of the whole record before the agency, that the proposed project as revised may have a significant effect on the environment.

If revisions are adopted in the project plans or proposals in accordance with CEQA Guidelines Section 15070(b) (1), a Mitigated Negative Declaration (MND) is prepared.

1.2 Lead Agency

The Lead Agency is the public agency that has the principal responsibility for carrying out or approving a proposed project. CEQA Guidelines Section 15051 states that if a project will be carried out by a public agency, that agency shall be the Lead Agency, even if the project would be located within the jurisdiction of another public agency. Since the Nevada Irrigation District (NID) will oversee and implement the Aquatic Weed Management Program, NID is the Lead Agency for the project for the purposes of CEQA.

1.3 Purpose and Document Organization

The purpose of this Initial Study is to determine if the proposed Nevada Irrigation District's Aquatic Weed Management Program may have a potentially significant impact on the environment.

This document is divided into the following sections:

1.0 Introduction and Regulatory Guidance - provides an introduction and describes the purpose and organization of this document.

2.0 Project Description - provides a detailed description of the proposed project including the location of the project.

3.0 Initial Study Checklist - describes the environmental setting for each of the environmental subject areas, and evaluates a range of impacts in response to the environmental checklist. Impacts are classified as "no impact", "less than significant", "potentially significant unless mitigation is incorporated", or "potentially significant". Where appropriate, mitigation measures are provided that mitigate potentially significant impacts to a less-than-significant level.

4.0 Determination - provides the environmental determination for the project.

5.0 Report Preparation and References - identifies a list of staff and consultants responsible for preparation of this document, and persons and agencies consulted. This section also identifies the references used in preparation of the MND.

Appendix A – Mitigation Monitoring Plan – identifies mitigation measures included in the Initial Study and the responsible entity for implementation of the mitigation measures. Required by Section 15097 of the CEQA Guidelines.

Appendix B – NID Aquatic Weed Management Monitoring Plan – Describes in detail the Aquatic Weed Management Monitoring Plan adopted by Nevada Irrigation District. Details include sampling sites, requirements, and procedures.

Appendix C – Quality Assurance Protection Plan (QAPP) – Describes the organization, function, procedures, specific quality assurance (QA) and quality control (QC) for collecting and analyzing samples for the Aquatic Weed Management Monitoring Program of Nevada Irrigation District.

Appendix D – Herbicide Concentration Formulas – Provides information on the formulas used by Nevada Irrigation District in calculating concentrations of herbicides.

Appendix E – Special Status Species Table – Identifies species of concern and endangered and threatened amphibian, reptile, fish, mammal and plant species which are found in Nevada, Placer and Yuba counties.

Appendix F – Pesticide Labels – Includes labels for each of the aquatic herbicides used by Nevada Irrigation District.

Appendix G – Nevada Irrigation District Aquatic Herbicide Application Report 2002 – Copy of the required report that is submitted to the Regional Water Quality

Control Board each year. This report provides details of Nevada Irrigation Districts' year herbicide application activities for 2002.

Appendix H – Mitigation Measures – includes a table of mitigation measures that will be implemented as part of the Aquatic Weed Management Program by Nevada Irrigation District.

1.4 Terminology Used in this Document

This Environmental Checklist in this document utilizes the following terminology to describe the various levels of significance associated with project related impacts:

Potentially Significant Impact: An impact that may have a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project" (CEQA Guidelines Section 15382); the existence of a potentially significant impact requires the preparation of an EIR with respect to such an impact;

Less Than Significant With Mitigation Incorporated: An impact that could be mitigated to a level of less than significant with the addition of mitigation measures;

Less Than Significant Impact: An impact which is less than significant and does not require the implementation of mitigation measures; and

No Impact: Utilized for checklist items where the project will not have any impact and does not require the implementation of mitigation measures.

1.5 Additional Information and Commenting on this Initial Study / Mitigated Negative Declaration

For additional information regarding this project, review studies or reports referenced in this report or comment on this document, please contact or send correspondence to:

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2.0 PROJECT DESCRIPTION

2.1 Project Location

The Nevada Irrigation District (NID) service area encompasses an area totaling approximately 287,000 acres located in Nevada, Placer, and Yuba counties (Figure 1 — Nevada Irrigation District Service Area and Herbicide Application Sites). A majority of the land with the district is located in the lower foothill ranges of the western Sierra Nevada extending west to California's Central Valley. The South Yuba River just north of Nevada City marks the northern boundary of the district and extends east to Englebright Reservoir. The western boundary extends generally due south from Englebright Reservoir to Camp Far West Reservoir, then continues non-linearly to the south to an area west of the City of Auburn. The southern boundary, also non-linear, is defined by the area west of the City of Auburn to an area just inside the Auburn boundary south of Lake Combie. The eastern boundary extends from the northwest corner of the City of Auburn boundary south of Lake Combie, northeast around the eastern edge of Rollins Reservoir, north and around the eastern edge of Scotts Flat Reservoir, then north to the South Fork of the Yuba River north east of Nevada City.

2.2 Surrounding Land Uses and Setting

The Aquatic Weed Management Program herbicide application program is operated within the service area of NID. The land is characterized by pine and oak woodland, annual grassland, canals, urban and rural development. The project ranges in elevation from approximately 100 to 3000 feet MSL. Several reservoirs, waterbodies, and waterways are located within NID boundaries including Scott's Flat Reservoir, Rollins Reservoir, Lake Combie, Bear River, Wolf Creek, Deer Creek, and Auburn Ravine. NID operates and maintains 420 miles of canals, 300 miles of pipeline, 7 hydroelectric power plants, and 8 water treatment plants all within their boundary.

The land use is typically forested with areas of rural residential in the eastern portion of the district in the lower foothills of the Sierra Nevada. Urbanization gradually increases in areas closer to the Sacramento Central Valley. Urban areas include the vicinities of Auburn, Nevada City and Grass Valley. Land use in these areas is high-density residential, low density residential, commercial, and airports. Agricultural land use includes ranches, pastureland, and orchards. Utilities, such as water treatment plants and wastewater treatment plants, are also found within the project area. The Spenceville Wildlife Management and Recreation Area straddles the western boundary of NID.

2.3 Background

NID is a public entity that provides reliable water supplies for agricultural, municipal, commercial and recreational uses. The District was formed in 1921 to provide a reliable, year-round water supply to its customers in Nevada County. In 1926, residents of Placer County chose to join the district, adding an additional 66,500 acres, for a total of 287,000 acres.

As part of their management plan, NID conducts the Aquatic Weed Management Program. This program involves the application of herbicides into their canals in order to remove unwanted vegetation, which can impede water flow if left unchecked. A map of the District canal system showing herbicide application sites, and types of herbicides

applied are shown in Figure 1 — Nevada Irrigation District Service Area and Herbicide Application Sites. NID began applying herbicides to the water conveyance system during the early 1960's to remove aquatic vegetation from canals and brush from right-of-ways, and has found that the use of herbicides is the most cost effective and safe method of controlling weeds and algae.

2.3.1 *Judicial and Regulatory Setting*

On March 12, 2001, the Ninth Circuit U.S. Court of Appeals issued its decision in Headwaters, Inc. v. Talent Irrigation District, 243 F.3d 526 (9th Cir. Mar. 12, 2001). The case originated from circumstances surrounding a fish kill in a nearby creek that was a result of herbicide applications by Talent Irrigation District (TID). To control the growth of aquatic weeds and vegetation in its canals, TID applies Magnacide H, an aquatic herbicide, into the canals to ensure unimpeded flows. A local environmental group sued TID, alleging that the herbicide application constituted an unlawful discharge under the Clean Water Act (CWA), since the district did not hold an NPDES permit. TID argued that aquatic herbicide applications were exempt from the NPDES requirement as described by the Environmental Protection Agency Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) registration and labeling requirements. The court ruled that FIFRA does not absolve one from the CWA requirement of obtaining a NPDES permit, and that herbicide applicators are required to obtain an NPDES permit.

The CWA requires permits for the discharge of a pollutant into navigable waters from a point source. The court's decision determined that direct application of aquatic herbicides to irrigation canals constitutes a "discharge," that the residual pesticide that remains in the water after its application constitutes a "pollutant," and that the irrigation canals constitute "navigable waters," or waters of the United States because they are tributaries to natural streams with which they exchange water. The court did not address whether the discharge was from a "point source" because TID did not dispute that the application hose that delivered the herbicide was a point source. The court's decision potentially affects all aquatic pesticide applications into waters of the United States including public entities, such as NID, which operate irrigation canals.

2.3.2 *General Permit*

Following the issuance of the *Talent* decision, the California State Water Resources Control Board (SWRCB) issued a General Permit for discharges of aquatic pesticides (WQ Order No. 2001-12-DWQ). The Permit allowed dischargers to comply with the court order and that the State Board would rescind or revise the General Permit if the law changes. The General Permit does not cover non-point source discharges from agriculture, or other indirect discharges of pesticides that may be conveyed in storm water runoff. Entities that have applied for coverage under the General Permit include irrigation districts, municipal supply districts, and mosquito abatement districts.

Coverage under the General Permit is available to public entities for discharges of pollutants to waters of the United States ("water bodies") associated with the application of aquatic pesticides for resource pest management. The limitation to "public entities" is based on provisions of the SWRCB's *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (the State Implementation Policy, or SIP) allowing categorical exceptions from meeting priority pollutant criteria/objectives for resource or pest management control measures conducted by "public entities". "Public Entity" is defined in the SIP to include "the federal government or state, county, city and county, city, district, public authority, or public agency." The categorical exception provision also gives examples of

management programs that such public entities may conduct: vector or weed control, pest eradication, or fishery management. The entities that conduct such programs vary in legal structure, but all have in common a public role of protecting waterways and/or the public health from harmful organisms. This General Permit is available to all such entities regardless of legal structure, including mutual water companies, public water purveyors, investor-owned utilities, and homeowners' associations.

The SIP further provides that the categorical exception is for resource or pest management conducted by public entities "to fulfill statutory requirements, including, but not limited to, those in California Fish and Game, Food and Agriculture, Health and Safety, and Harbors and Navigation codes." Some of these provisions do not mandate the management programs but make their implementation discretionary.

2.3.3 *Clean Water Act Enforcement*

The Federal Environmental Protection Agency (USEPA) stated that enforcement of the requirements set forth in the Talent case is a low priority so long as the pesticide is applied according to label instructions and there are no egregious circumstances. On March 29, 2002 USEPA issued a memorandum that is intended to clarify a jurisdictional issue that has arisen in the context of the Talent decision. The memorandum concludes that the application of an aquatic herbicide consistent with the FIFRA label "to ensure the passage of irrigation return flow" falls within the statutory exemption from "point source" for return flows from irrigated agriculture.

USEPA is apparently embracing a broader definition of "return flows from irrigated agriculture" to include water that is on its way to be used for irrigation, and is encompassed within the term "return flows," and thus is exempt. The court on the other hand determined that because some of the time water returns to streams and is not used by irrigators, that this water constituted a discharge to waters of the United States. Since California is within the jurisdiction of the Ninth Circuit and is governed by the Talent decision, irrigation districts that rely on the USEPA interpretation and do not obtain coverage under the general permit may be at risk of liability for violation of the CWA. In addition, since the EPA memorandum states that the exemption does not apply where discharges occur into an irrigation canal that is a water of the United States, and the Talent decision found that the irrigation canal was a water of the United States, the interpretation of the exemption may be quite narrow.

2.3.4 *Basis for CEQA Review*

The General Permit was issued under emergency conditions, in response to the Talent decision, which determined that discharges of aquatic pesticides to waters of the United States require coverage under an NPDES permit. Discharge of aquatic pesticides by public entities covered by the General Permit is considered necessary for conducting resource or pest management programs in order to fulfill statutory requirements and to protect beneficial uses of water and the public health. Many of the public entities would be unwilling to perform the activities prior to the issuance of an NPDES permit because of the substantial liability they could incur for discharging aquatic pesticides in violation of the CWA.

Due to the emergency nature of this General Permit, many actions that would normally occur prior to granting a permit with a categorical exception to priority pollutant objective/criteria have not yet occurred. The General Permit was issued as a limited term permit, and will expire January 31, 2004. On going activities will provide the basis for a full-term permit in the future.

Public entities that are subject to the General Permit, such as NID, are required to complete the necessary CEQA documents to justify the categorical exception. NID has also developed a monitoring plan that will be the basis of monitoring requirements in the next permit. Details of the monitoring plan can be located in Appendix A. The SWRCB will consider issuing future permits that are more limited in nature as to specific pesticides, types of resource and pest management programs, or areas of the State. The future permits will be based on the submittals received during this General Permit term, will specify whether categorical exceptions are warranted, and will ensure that other applicable water quality standards and criteria, including the antidegradation policy, are achieved.

2.3.5 Water Quality Criteria

Of the products proposed for use, the pollutants of concern are elemental copper, acrolein, and glyphosate. Many water quality criteria exist for them. A comprehensive list of all applicable water quality criteria for these pollutants is provided in below Table 1. The antidegradation policy is intended to ensure the maintenance of existing high quality waters (State Water Resources Control Board Resolution No. 68-16). The policy states:

- High quality waters shall be maintained until it has been demonstrated to the State that any change will be consistent with maximum benefit to the people of the State;

- Any discharges to high quality waters are required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur, and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.

A discussion of how these criteria relate specifically to this project is provided in Section 3.8. Hydrology and Water Quality.

To ensure compliance with all water quality standards, the most stringent criteria shall be used. For copper, the most stringent criteria are set by the California Toxics Rule and USEPA National Recommended Water Quality Criteria to Protect Freshwater Aquatic Life. A chart showing the 1-hour average and 4-day average copper criteria as a function of hardness is provided below in Table 2 — 1-Hour and 4-Day Average Copper Criteria.

Table 1 — Summary of Water Quality Criteria

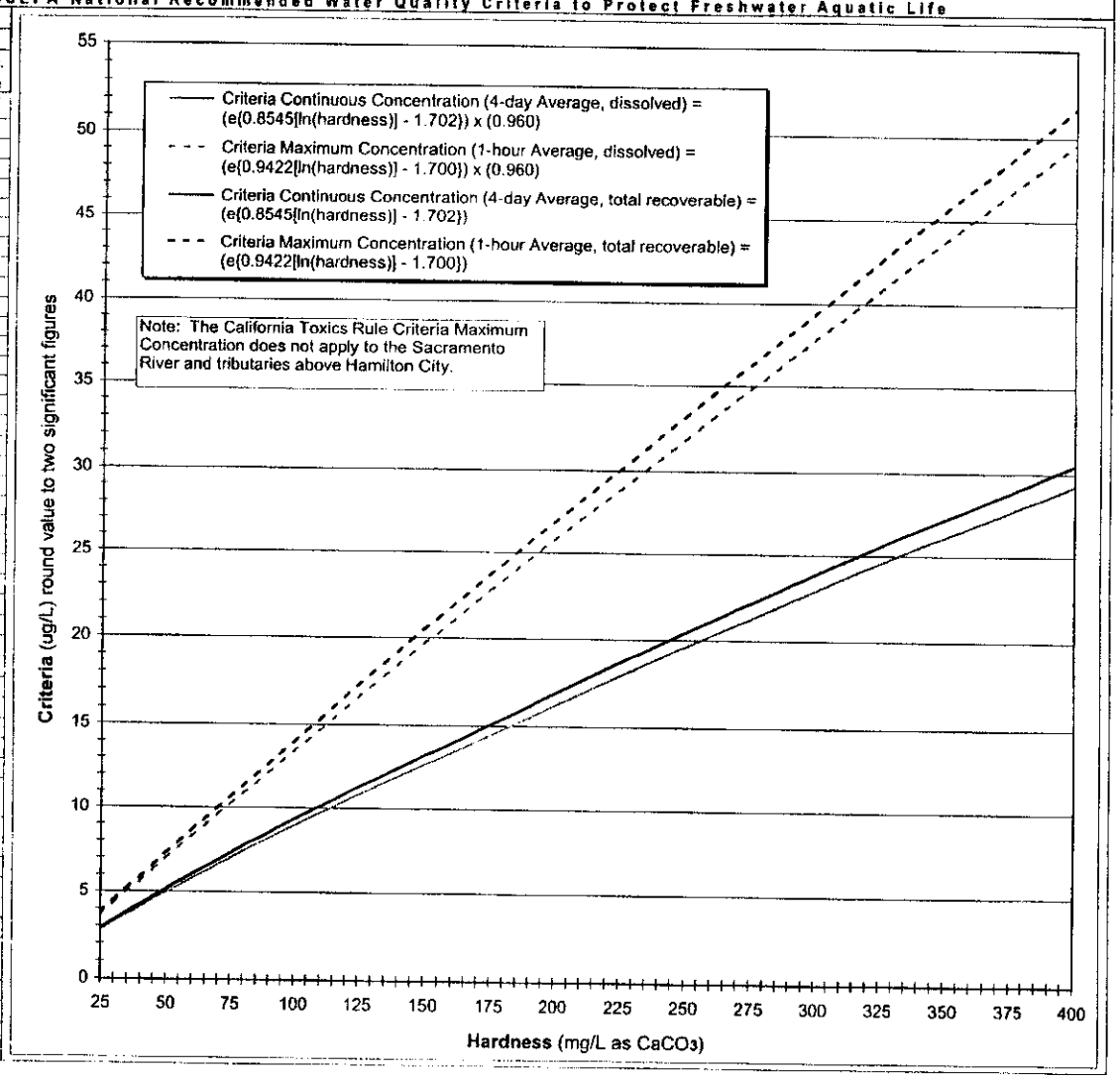
Foothill Associates		Criteria for Active Ingredients in Proposed Products		
		Magnacide H	Cutrine Plus, Copper Sulfate PD and Clearigate	Rodeo and Aquamaster
Primary Source	**Secondary Source**	Active ingredient - **Acrolein**	Active ingredient - **Elemental Copper**	Active ingredient - **Glyphosate**
California Toxics Rule	N/A	320 ppb - drinking water 780 ppb - aquatic organism consumption	see attached discussion regarding hardness dependent criteria	N/A
The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board Central Valley Region - 4th Edition - 1998	N/A	Compliance with SWRCB Resolution No. 68-16 (attached) and narrative criteria for protection of beneficial uses	see attached discussion regarding hardness dependent criteria	Compliance with SWRCB Resolution No. 68-16 and narrative criteria for protection of beneficial uses
California Regional Water Quality Control Board Central Valley Region, A Compilation of Water Quality Goals (Water Quality Goals) August 2003	Agricultural Water Quality Goals	N/A	200ppb	N/A
Water Quality Goals	California Dept. of Health Services (Primary MCL)	N/A	1300 ppb	700 ppb
Water Quality Goals	California Dept. of Health Services (Secondary MCL)	N/A	1000 ppb	N/A
Water Quality Goals	USEPA Primary MCL	N/A	1300 ppb	700 ppb
Water Quality Goals	USEPA Secondary MCL	N/A	1000 ppb	N/A
Water Quality Goals	USEPA MCL Goal	N/A	1300 ppb	700 ppb
Water Quality Goals	California Public Health Goal in Drinking Water	N/A	170 ppb	1000 ppb
Water Quality Goals	USEPA National Recommended Ambient Water Quality Criteria (EPA RAWQC)	Non-cancer human health effects 320 ppb - drinking water 780 ppb - aquatic organism consumption	1300 ppb (Human health, drinking water, non-cancer health effects) and see attached discussion regarding hardness dependent criteria	N/A
Water Quality Goals	Taste and Odor Thresholds	110 ppb	N/A	N/A
Water Quality Goals	EPA RAWQC	N/A	1000 ppb (Human health, taste & odor or welfare)	N/A
Water Quality Goals	EPA RAWQC Freshwater and Inland Surface Water Aquatic Life Protection	N/A	see attached discussion regarding hardness dependent criteria	N/A
Water Quality Goals	USEPA Integrated Risk Information System	N/A	N/A	700 ppb
Water Quality Goals	USEPA Drinking Water Health Advisories or Suggested No-Adverse-Response Levels	N/A	N/A	700 ppb
TMDL or 303(d) listing	none in the project area	none in the project area	none in the project area	none in the project area

Table 2 – 1-Hour and 4-Day Average Copper Criteria

WATER QUALITY LIMITS FOR CONSTITUENTS AND PARAMETERS
FRESHWATER AQUATIC LIFE - COPPER

California Toxics Rule and USEPA National Recommended Water Quality Criteria to Protect Freshwater Aquatic Life

Hardness (mg/L as CaCO3)	Copper (ug/L) Dissolved: Continuous Conc. 4-day Average	Dissolved: Maximum Conc. 1-hour Average	Total Recoverable: Continuous Conc. 4-day Average	Total Recoverable: Maximum Conc. 1-hour Average
< 25	use formula	use formula	use formula	use formula
25	2.7	3.6	2.9	3.8
30	3.2	4.3	3.3	4.5
35	3.7	5.0	3.8	5.2
40	4.1	5.7	4.3	5.9
45	4.5	6.3	4.7	6.6
50	5.0	7.0	5.2	7.3
55	5.4	7.7	5.6	8.0
60	5.8	8.3	6.0	8.7
65	6.2	9.0	6.5	9.3
70	6.6	9.6	6.9	10
75	7.0	10	7.3	11
80	7.4	11	7.7	11
85	7.8	12	8.1	12
90	8.2	12	8.5	13
95	8.6	13	8.9	13
100	9.0	13	9.3	14
110	9.7	15	10	15
120	10	16	11	17
130	11	17	12	18
140	12	18	12	19
150	13	20	13	21
160	13	21	14	22
170	14	22	15	23
180	15	23	15	24
190	15	25	16	26
200	16	26	17	27
210	17	27	18	28
220	18	28	18	29
230	18	29	19	31
240	19	31	20	32
250	20	32	20	33
260	20	33	21	34
270	21	34	22	36
280	22	35	22	37
290	22	37	23	38
300	23	38	24	39
310	24	39	25	41
320	24	40	25	42
330	25	41	26	43
340	25	43	27	44
350	26	44	27	46
360	27	45	28	47
370	27	46	29	48
380	28	47	29	49
390	29	48	30	50
400	29	50	30	52
> 400	29	50	30	52



2.3.6 *General Plans*

A review of the General Plans for Nevada, Placer, and Yuba counties was conducted, and it was concluded that the activities of the NID Aquatic Weed Management Program support the land use and development policies for these counties. NID takes part in a cooperative effort with other public and private agencies in the area that are concerned with water management practices and conservation. Support of the county general plans includes the protection of resources which produce water for domestic and agricultural consumption through the delivery of surface water. The delivery of irrigation water to agricultural areas ensures the preservation of agricultural activities throughout NID's service area.

2.3.7 *General Aquatic Vegetation Information*

Aquatic Plants

There are three basic categories of aquatic plants: floating, submerged, and emergent.

Floating Aquatic Plants - These plants either float freely on the surface deriving their nutrients directly from the water via root systems or cell wall interactions, or they have leaves that float on the surface and are rooted in the bottom sediment. Examples of these plants include duckweed, watermeal, water lilies, and watershield (Marine Biochemists, Aquatic Weed Control).

Submerged Weeds - These plants are completely underwater and are generally rooted in the bottom sediment. If flowers exist, they may extend above the surface of the water. Plants in this group include the many species of pondweed, naiad, water stargrass, eelgrass (also known as wild celery), watermilfoil, eurasian watermilfoil, coontail, bladderwort, and elodea/hydrilla (Marine Biochemists, Aquatic Weed Control).

Emergent Weeds - These plants grow in shallow areas of lakes, ponds, rivers, and ditches. Generally rigid, these plants do not need water for support. Some of these plants are not considered truly aquatic, but can survive submerged in water or in saturated soils for extended periods of time. Plants in this group include cattail, spikerush, bulrush, creeping water primrose, purple loosestrife, arrowhead, pickerelweed, and waterwillow (Marine Biochemists, Aquatic Weed Control).

Algae

Algae are closely related to fungi and consist of over 17,000 different species. The three main types of algae are planktonic, filamentous and attached-erect.

Planktonic algae are microscopic plants usually existing in suspension in the upper few feet of water that often reach bloom proportions making the water appear brownish or pea soup green. The natural die-off of this form can cause summer fish kills due to depletion of dissolved oxygen, and some species are known to be toxic to livestock, wildlife, and man or impart odor and taste problems to water (Marine Biochemists, *Algae Control)*.

Filamentous algae are also known as "pond moss" or "pond scum" due to its formation of greenish mats floating upon the water's surface. Its filaments consist of a series of cells being joined end-to-end giving a thread-like appearance. This form begins growing on the bottom or substrate and then lifts to the surface as buoyancy grows due to its production of oxygen. It can also exist in forms that appear fur-like growing on rocks,

bottom logs, or similar features. This form of algae may also appear cottony, slimy, or coarse in texture (Marine Biochemists, *Algae Control*).

Attached-erect algae (*Chara and Nitella* species) are advanced forms of algae that appear almost weed-like being yellow or grayish-green in color with a gritty/bristly texture and a musky odor. Its leaf-like structures are at fairly uniform intervals and are whorled about the stem. These forms may cover the entire bottom of the pond and are considered in most cases to be beneficial promoting water clarity, enhanced fish habitat, bottom sediment stabilization, and plant population stabilization by crowding out less desired species (Marine Biochemists, *Algae Control*).

2.4 Project Purpose

The purpose of the NID Aquatic Weed Management Program is to remove aquatic vegetation in order to manage and maintain water flows through the canals and waterways under its jurisdiction. For many years irrigation districts in the western United States have routinely applied aquatic herbicides to their ditches and canals to control the growth of submersed and emergent aquatic vegetation. Removing vegetation is essential to maintain unrestricted water delivery to agricultural and residential customers and also to prevent flood damage to canals. This Initial Study will address the environmental effects of the Aquatic Weed Management Program (AWMP) managed by NID, to ensure compliance with the California Environmental Quality Act (CEQA).

2.5 Aquatic Plant Management Techniques

The three main categories of management practices available for aquatic weed management are biological, mechanical and physical, and chemical controls.

2.5.1 Biological Control

Biological controls of aquatic weeds involve the introduction of parasites, predators or pathogens into the aquatic environment that target the vegetation to be removed. This method will suppress, but not eliminate or eradicate the vegetation, and acts by reducing population numbers. Biological control methods are considered the most environmentally acceptable BMP practices for control of aquatic weeds, and several approaches are listed below (AERF, 2003).

- The classical approach involves the introduction of host-specific organisms of the targeted plant.
- The inundative approach applies the use of opportunistic native or exotic pathogens or insects
- The use of general feeders or non host-specific organisms such as grass carp are used to control most types of submersed aquatic vegetation
- The conservation or augmentation of native herbivores

Biological controls are typically a long-term approach, and one of the disadvantages of this method is that its effectiveness may take years to develop. It is best used in low-priority areas where other strategies would be cost prohibitive, or in conjunction with other short-term methods such as mechanical and chemical controls.

Several biological organisms currently used include grass carp (*Ctenopharyngodon idella*), insects, and naturalized pathogens. These act to control vegetation by grazing, internal fluid removal, and implementing disease on the targeted plants. Although the

grass carp used for biological control are sterile, it should be noted that some jurisdictions do not allow their use. California has approved the use of the grass carp throughout the state, but with certain restrictions (personal communication with Michael Mizumoto of Imperial Irrigation District on November 10, 2003). Grass carp are used extensively in the Imperial Irrigation District in southern California.

2.5.2 *Mechanical and Physical Control*

Physical and mechanical practices such as hand pulling and raking are also available to control aquatic weeds. It is important when physically removing vegetation the entire plant including the roots are removed since many plants are able to regenerate from root stems and shoots, or are spread by fragmentation of the plant material. This process often needs to be repeated to control regrowth and is very labor intensive. The removal of weeds by hand or tools is used for localized removal of plants and is best suited for small areas of vegetation, and in shallow areas (AERF, 2003).

Mechanical harvesters are also available to remove vegetation and act by cutting and collecting the aquatic plants. This is useful for plants which extend down into deeper waters and over wide areas as they are able to cut an area 6-20 feet wide. The collected material is removed and deposited in upland areas. A limitation of this method is the requirement of adequate water depth and area to accommodate the size of the harvesting equipment. Another disadvantage to this method is the fragmentation of plant materials during removal which can lead to the spread of the vegetation to new areas if not collected. Insects and fish also have the potential to be damaged or removed along with the vegetation. This method is costly due to equipment operation and the need to be performed several times a year to maintain control (AERF, 2003).

Weed rollers and rotovators are two other methods that can be implemented in the physical removal of unwanted vegetation. Weed rollers can be left in place along the shore attached to a dock and operated periodically. The roller travels forward and reverses in a 270° arc around its anchor position. It compresses the sediments and plants in the area and controls weeds by limiting growth to those periods between operation. This method is not allowed in some states due to the possibility of plant spread due to fragmentation. Rotovators acts similarly to garden rototillers by removing and churning up sediments and plant materials. Many environmental concerns exist with churning up the sediments such as re-suspension of contaminated sediments, impacts to benthic organisms, and impacts to fish spawning areas. It is effective for rapidly clearing areas and can be used year round. These methods are limited to areas with little underwater obstructions since equipment could be damaged by rocks, logs, or other debris. Rotovators are also not allowed in some states and appropriate local and state agencies should be consulted prior to implementing these practices (AERF, 2003).

Bottom or benthic barriers are methods used to cover plants and prevent their spread and growth. A barrier is attached to the benthic area with sandbags or pins, and is commonly composed of geotextiles or a similar erosion control material. Although this method can provide 100% control of weeds in the area, it is limited to smaller areas, as it is only able to cover one acre or less. Divers may be required to apply the material in deeper areas, and periodic maintenance is necessary to inspect the barrier and keep it clear of sediment build up. Due to potential impacts to benthic organisms, many states require permits for the application of materials to the bottom of lakes or streambeds.

Dredging is another physical method that is used to remove rooted vegetation along with the removal of sediments including those that contain toxic materials. This method is very costly and has the potential to create negative environmental effects due to the resuspension of toxic sediments, and increasing turbidity. As a result of these environmental impacts as well as specific local and state requirements, this method is rarely used to remove unwanted vegetation.

Water drawdown is another method aquatic plant managers can use, although its use is limited to those areas where water levels can be controlled. This method is relatively inexpensive and can be effective for 2 or more years. Some disadvantages are the impacts to fish species, interference with drinking water or recreational functions, and the potential to increase the spread of some species such as hydrilla (AERF, 2003).

Shading can be used to reduce the amount of light required by plants for photosynthesis, and is most effective when used on narrow streams and small ponds. Water soluble dyes, shading fabrics or covers, and shade trees are some of the ways this can be achieved.

Algae and phytoplankton may be controlled by nutrient inactivation, which involves the addition of aluminum sulfate (alum) into the water column. Aluminum sulfate acts by binding to phosphorus, thus making it unavailable to the algae, which it requires for growth. This method is limited to algae and phytoplankton, since larger vascular plants are not affected, because they are limited by nitrogen rather than phosphorus. This method may actually promote denser infestations of larger vascular plants since the elimination of algae increases water clarity (AERF, 2003). In California, aluminum sulfate is not labeled for aquatic uses so would not constitute a viable option for usage.

When considering any of these mechanical and physical practices of aquatic vegetation removal it is important to consult local, state, and federal agencies since many areas may require permits or have specific restrictions to these methods.

2.5.3 Chemical Controls

One of the most widely used and effective methods to control aquatic vegetation is the use of chemicals, such as herbicides. Due to safety, health, and environmental concerns, the use of herbicides has been intensively reviewed over the last few decades and major regulations have been implemented because of these concerns. Currently no herbicide product is approved for aquatic use by the USEPA if it has more than a one in million chance of causing significant harmful effects to human health, wildlife, or the environment when used according to its' label requirements. As a result of these standards very few herbicides are available for aquatic applications (see Table 3 — EPA Approved Herbicides for Aquatic Use). Magnacide H (acrolein) is not listed in the table since it is only approved for use in irrigation canals.

When applying aquatic herbicides to water applicators need to consider the water exchange rate to determine the appropriate exposure time needed to control a specific target plant. These exposure times are usually determined in laboratory and field studies. For more details on the specific herbicides used by NID see section 2.6.1.

NID has found that the use of herbicides is the most cost effective and safe method of controlling weeds and algae. Without vegetation removal the buildup of filamentous algae, and aquatic vegetation can cause blockages in access channels and impede flows. The herbicides used include Aquamaster/Rodeo, Clearigate, Copper Sulfate PD,

Cutrine Plus, and Magnacide H. Table 4 — Aquatic Herbicides used by Nevada Irrigation District lists each pesticide used by NID, along with their active ingredient and targeted weed, and Table 5 — Plants targeted by the Nevada Irrigation District Aquatic Weed Management Program, lists the plants targeted. These pesticides are applied in accordance to the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) label requirements (2.7.2)and in a manner consistent with Best Management Practices (BMPs) listed in section 2.7. NID applies herbicides at the rate of every 3-4 weeks depending on need. Appropriate herbicide concentrations are determined by a mathematical formula that takes into consideration flow, volume of discharge and water temperature. Formulas for each application of herbicide are provided in Appendix D.

2.6 Project Components

2.6.1 *Herbicide Use*

Herbicides are defined as chemicals used to control vegetation by causing death or suppressing growth. For the aquatic plant manager, herbicides are tools that can be used to manage aquatic vegetation in a safe, efficient, and cost effective manner, and are often a key component of aquatic management plans. Herbicide formulations consist of an organic (carbon-containing) or inorganic active ingredient, an inert carrier, and perhaps adjuvants, which enhance the products effectiveness.

Herbicides sold in the United States must be registered with the Federal government and state regulatory agencies, and are regulated and reviewed by the EPA Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA 1996; 7 U.S.C. 136 et seq., Public Laws 92-516, 94-140, and 95-356). There are about 200 herbicides (active ingredients) currently registered in the United States, however, only a few (Table 3 — EPA Approved Herbicides for Aquatic Use) are labeled for use in aquatic sites (Langeland and Thayer, 1998). The uniqueness of the aquatic environment limits the number of compounds that will be effective for controlling aquatic plants and also meet the rigid environmental and toxicology criteria necessary for registration. Aquatic herbicides must have the capacity to be taken up by plants quickly in sufficient amounts from water to be toxic to target plants and have sufficiently low toxicity to man and other organisms in the aquatic environment. Aquatic herbicides are classified as either contact or systemic.

Contact herbicides act quickly on the tissues contacted, and are generally lethal to all plant cells that they contact. Because of this rapid action, or other physiological reasons, they do not move extensively within the plant and are effective only where they contact plants. For this reason, they are generally more effective on annual (plants that complete their life cycle in a single year), herbaceous plants. Perennial (plants that persist from year to year), woody plants can be defoliated by contact herbicides but they quickly resprout from unaffected plant parts. Submersed aquatic plants that are in contact with sufficient concentrations of the herbicide in the water for long enough periods of time are affected but regrowth occurs from unaffected plant parts, especially plant parts that are protected beneath the hydrosoil. Because the entire plant is not killed by contact herbicides, retreatment is necessary, sometimes two or three times per year (Langeland and Thayer, 1998).

Systemic herbicides are absorbed into the living portion of the plant and move throughout the plant. Different systemic herbicides are absorbed to varying degrees by different plant parts. A systemic herbicide, such as glyphosate, is only active when applied to and absorbed by the foliage. When applied correctly, systemic herbicides

act slowly in comparison to contact herbicides. They must move to their site of action within the plant. Systemic herbicides are generally more effective for controlling perennial and woody plants than contact herbicides, and generally have more selectivity than contact herbicides (Langeland and Thayer, 1998).

Table 3 — EPA Approved Herbicides for Aquatic Use

Compound	Trade Name	Contact vs. Systemic	Mode of Action
Copper (chelates and sulfates)	Copper Sulfate PD Cutrine-Plus Komeen Koplex K-Tea Several Others	Systemic or Contact	Plant cell toxicant
2,4-D	Navigate Aqua-Kleen IVM 44 Many others	Systemic	Selective plant-growth regulator
Diquat	Reward Weedtrine	Contact	Disrupts plant cell membrane integrity
Endothall Dipotassium Salt (Herbicide) Amine Salt (Algaecide)	Aquathol K Hydrothol 191 Aquathol granular	Contact	Inactivates plant protein synthesis
Fluridone	Sonar AS Sonar SRP Sonar PR Avast!	Systemic	Disrupts carotenoid synthesis, causing bleaching of chlorophyll
Glyphosate	Aquamaster AquaPro Rodeo Eagre Roundup	Systemic	Disrupts synthesis of phenylalanine
Triclopyr	Garlon 3A Renovate	Systemic	Selective plant growth regulator

Table 4 — Aquatic Herbicides used by Nevada Irrigation District

Herbicide	Active Ingredient	Targeted Vegetation
Magnacide H	Acrolein	Submerged and Floating weeds, and algae
Rodeo and Aquamaster	Glyphosate	Floating Plants and Emergent Plants
Copper Sulfate PD	Copper Sulfate	Algae
Cutrine-Plus	Elemental Copper	Algae (filamentous and planktonic)
Clearigate	Elemental Copper	Submerged Plants and Algae

Table 5 — Plants targeted by the Nevada Irrigation District Aquatic Weed Management Program

Emergent Aquatic Plants		Submerged or Floating Aquatic Plants	
Common Name	**Latin Name**	**Common Name**	**Latin Name**
Creeping Waterprimrose	*Ludwigia peploides*	Algae	Many species
Smallflower umbrella sedge	*Cyperus difformis*	Parrotfeather	*Myriophyllum aquaticum*
California arrowhead	*Sagittaria montevidensis*	Southern naiad	*Najas guadalupensis*
Common waterplantain	*Alisma plantago-aquatica*	Curlyleaf pondweed	*Potamogeton crispus*
Jungle rice	*Echinochloa colona*	American pondweed	*Potamogeton nodosus*
Barnyard grass	*Echinochloa crusgalli*	Sago pondweed	*Struckenia pectinatus*
Mexican sprangletop	*Leptochloa uninervia*	Common elodea	*Elodea canadensis*
Dallisgrass	*Paspalum dilatatum*	Eurasian watermilfoil	*Myriophyllum spicatum*
Swamp smartweed	*Polygonum amphibium*	Ferns	Many species
Himalaya blackberry	*Rubus discolor*	Common duckweed	*Lemna major*
Water speedwell	*Veronica anagallis-aquatica*	Mosquito fern	*Azolla filiculoides*
Common cattail	*Typha latifolia*		
Tall vervain	*Verbena bonariensis*		
Witchgrass	*Panicum capillare*		

2.6.2 *Aquamaster/Rodeo*

Glyphosate is the active ingredient in both Aquamaster and Rodeo products. It is a systemic broad-spectrum herbicide that is used to control broad-leafed plants, grasses, and sedge species in both agricultural and non-agricultural landscapes, and is not useful

in controlling submerged plants. Broad-spectrum herbicides are those herbicides that target a wider range of plants in comparison to a narrow-spectrum herbicide. A systemic herbicide is one that is absorbed into the plant through the leaves, stems or roots and transferred throughout the plant to kill it from the inside, and as a result kill less quickly than do contact herbicides (Plant Management in Florida Waters, 2003). Products containing glyphosate should be applied carefully since it has the potential to kill most plants that come into contact with it. Glyphosate's mode of action involves the inhibition of a key nitrogen metabolism enzyme that is essential to plants for growth and survival (Langeland and Thayer, 1998).

Glyphosate has been registered in since 1974 and an estimated 38-48 million pounds per year is used in the United States. USEPA considers Roundup the "most used conventional pesticide in the United States" (Cox, 1998).

Glyphosate is generally applied as a liquid via a sprayer at rates of 4-7.5 pints per acre. One of the benefits of using a backpack or motorized vehicle sprayer with a hose is the ability to target only those plants which need to be removed. Plants can take several weeks to die and a repeat application is often necessary to remove plants that were missed during the first application (Washington State Department of Ecology: Water Quality Home, 2003). Information on the application concentrations and formulas of glyphosate used by NID can be found in Appendix D.

Most products containing glyphosate also contain a surfactant (detergent-like substance), which helps it to penetrate plant cells. Roundup contains the surfactant POEA, and other inert ingredients included in glyphosate products include ammonium sulfate, isobutene, potassium hydroxide, sodium sulfite, and sorbic acid (Cox, 1998).

The half-life of glyphosate in soil ranges from 3-141 days as measured by the manufacturer, with initial degradation being faster than the subsequent degradation of what remains. EPA's Ecological Effect Branch wrote "In summary, this herbicide is extremely persistent under typical application conditions". It is thought to be tightly bound by most soils and is essentially immobile (Cox, 1998). Stream analysis has tested positive for glyphosate in areas where it has been applied for agriculture, urban use, and forestry (PANNA, 1999).

Products containing glyphosate are acutely toxic to animals, including humans. The application of glyphosate can impact non-target organisms such as insects (i.e. Valley Elderberry Longhorn Beetle), mites, and spiders. The water flea, Daphnia pulex, is killed at concentrations of Roundup between 3-25 ppm. Earthworms also show a reduced growth and survival rate when exposed to repeated applications of glyphosate, and it has been shown to reduce the growth of nitrogen-fixing bacteria in laboratory tests. A study involving western chorus frog tadpoles and plains leopard frog tadpoles found that a concentration of less than 1 ppm of glyphosate-containing herbicides was lethal (Cox, 1998).

Both glyphosate and glyphosate-containing products are acutely toxic to fish. The surfactant portion of many glyphosate products causes it to have a much higher toxicity than glyphosate alone (20-70 times more toxic). Acute toxicities (LD_{50}) of Roundup to fish are from 2-55 ppm, with young fish being more sensitive than older fish, and with warmer waters generating an increased toxicity. In both rainbow trout and bluegills the toxicity doubled between 7 and 17°C (45-65 F). Because the herbicide kills shading vegetation it is thought that the water temperature increases for several years following its use in

riparian areas. This could cause increased toxicity to fish as a result of the increase in water temperature, and could be critical to fish such as juvenile salmon, which thrive in cold water (Cox, 1998).

2.6.3 *Copper Compounds*

Cutrine-Plus, Clearigate, and Copper Sulfate PD are three of the aquatic herbicides used by NID that are copper-based. Copper-based herbicides act as a plant cell toxicant and are considered both systemic and contact herbicides.

Copper-based herbicides typically have a ½ life of 3 days (7 days for copper sulfate PD) and can be used to treat submerged plants as well as algae (Boman, Wilson, Vandiver and Hebb, 2002). Advantages to copper-based herbicides are that they are inexpensive, fast-acting and approved for drinking water. Plants respond in 7-10 days and applications are usually effective for 4-6 weeks. If treated water is to be used for drinking, the concentration should not exceed 1 ppm (Kansas State University, Manhattan, 1996). One of the disadvantages for use is its resistance to biodegradation, although it remains biologically inactive when bound to sediments (Madsen, 2000). Concentrations and formulas used to determine application rates for copper compounds used by NID are located in Appendix D.

Cutrine-Plus

Cutrine-Plus is a liquid form of copper and is deep blue in color. It is a systemic algaecide that controls existing algae (planktonic, filamentous, and *Chara* species), and inhibits its recurrence by affecting photosynthesis capabilities. Cutrine-Plus is registered by USEPA for use in potable water reservoirs, farms, fish hatcheries, industrial ponds, lakes, irrigation conveyance systems, ditches, canals, and golf course hazards (Cygnet West Enterprises, *Cutrine-Plus Liquid: Algaecide/Herbicide*). Treated water can be used for swimming, domestic uses, and livestock applications immediately after treatment, and fish can also be consumed immediately after applying Cutrine-Plus to water. It has been used effectively in trout raceways and irrigation canals.

Cutrine-Plus is applied to flowing water using a continuous drip system. To control planktonic and filamentous algae it is applied at a rate of 0.6 gallons per acre-foot (43,560 cubic feet), and applied at a rate of 1.2 gallons per acre-foot to control *Chara* and *Nitella* species. The label suggests that it be diluted with at least 9 parts of water to facilitate even distribution during application (Great Fountains, *Cutrine-Plus Liquid*).

Several steps can be taken to optimize Cutrine-Plus effectiveness. Since copper affects the photosynthesis activities of plants, it should be applied during the day under sunny conditions when the water temperature is at least 60°F, as this is when photosynthesis activity is greatest. Algae should be treated when growth first appears and the product should be applied in a manner that will ensure distribution within the treatment area. If seasonal control is desired retreat areas when regrowth appears and allow 1-2 weeks between consecutive treatments. Allow at least 7-10 days to observe the treatment effects, which will be characterized by bleaching and breaking apart of the plant material (Applied Biochemists, 1998).

Cutrine-Plus may be toxic to trout and other species of fish with the toxicity being dependent upon the hardness of the water. It should not be used in water containing trout if the carbonate hardness of the water does not exceed 50 ppm. When using copper in hard water organic forms of copper are much more effective because they

stay in solution longer, are more readily absorbed by plants, and are less toxic to fish (Applied Biochemists, 1998).

Clearigate

Clearigate is a chelated copper compound that is used to control algae and plants. It is a broad-spectrum herbicide that is blended with adjuvants and emulsifiers (inert ingredients) that enhance copper uptake by plants, and also increases contact time in flowing water. It is formulated as a liquid containing 3.825% active ingredient, and there are no restrictions on water use for irrigation, drinking or stock watering following application (Cygnet West Enterprises, *Clearigate)*.

Recommended application rates are 0.1 - 0.5 ppm for planktonic algae, 0.2 - 0.6 ppm for filamentous algae, and 0.4 - 0.8 ppm for *Chara* and *Nitella* species. A rate of 0.5 - 1.0 ppm is recommended for submerged weeds. Clearigate can be applied by spot spray and injection from shore for low flow systems, gravity drip systems for medium flow, and a 12-volt metering pump set up is recommended for medium to high flow systems.

Early stages of growth are more susceptible to control by Clearigate, and should be applied on a clear sunny day, and early in the season when plants are green and actively growing. In addition, since Clearigate should be applied at the maximum rate when the pH is above 9.0, water should be treated early in the day, as waters will typically have the lowest pH in the early morning before plant photosynthesis begins. (Applied Biochemists, 1998).

Copper Sulfate PD

Copper sulfate PD (copper sulfate pentahydrate) is a contact herbicide and is an inorganic form of copper used as an algaecide, herbicide, fungicide, and bactericide. When inorganic copper is used as an algicide, it is much more effective and lower rates can be used in soft water (<50 ppm calcium carbonate hardness). When using copper in hard water, organic forms of copper are much more effective because they stay in solution longer, are more readily absorbed by plants and are less toxic to fish. Copper sulfate may be toxic to fish species at recommended dosages, especially in soft water. When using copper sulfate keep in mind that as water hardness decreases, toxicity to fish increases (Boman, et al). Sulfate compounds can exacerbate the methylization of mercury, making the mercury bio-available. Mercury exits in many of the watersheds in northern California since it was used extensively in gold mining operations.

2.6.4 Magnacide H

Acrolein is the active ingredient in Magnacide H, and is listed as a federally registered restricted use pesticide, which means it can only be legally applied by trained and certified applicators. It was originally registered as early as 1959 by Shell Chemical Corporation. The reported use of acrolein in California in 2001, which is the most recent data available, was 233,928 pounds. The majority of this amount as reported by USEPA Office of Pesticide Programs was applied to rights-of-way (206,610 lbs.) and water areas (14,513 lbs.) (Turner and Erickson, 2003).

At room temperature acrolein is a clear, colorless liquid with an intensively acrid odor. It is applied by injection from metered, pressurized containers into flowing water at a point of adequate mixing, such as downstream of a weir or siphon. The material is forced from the container using nitrogen gas and is introduced directly into the water from anywhere between 15 minutes to 8 hours. This is the preferred method of application into irrigation canals since acrolein is very volatile unless controlled. The acrolein travels downstream

as a wave of treated water, and the concentration of herbicide drops to zero after the wave has passed. The label developed by the registrant (Baker Petrolite Corporation) reports that efficacy is excellent for submerged algae and vascular plants, is good, though at higher levels, for floating vegetation, and that emergent vegetation is not controlled.

The amount of herbicide required depends on the amount of water flow and weed density in the canal. Concentrations of 1-15 ppm are needed for effective control, and according to label requirements, the concentration of acrolein in the water should never exceed 15 ppm. The actual amount used in any application will depend on the degree to which weeds occur and the size of the canal. Baker Petrolite Corporation, a manufacturer of acrolein, indicated that application amounts range from 1 gallon (6.7 pounds ai) for a very small canal to as much as 400 gallons (2680 pounds ai) for a large canal (Turner and Erickson, 2003). Water temperature affects efficacy, and the amount of product used may need to be increased as much as 100% when water temperatures reach at or below 50°F and up to 50% when the temperature is between 50-55°F. The manufacturer also indicates that acrolein is not really effective for aquatic weeds unless it is well mixed. In irrigation canals, the water flow provides for sufficient mixing. Information on the formulas used by NID to determine application rates and concentrations is located in Appendix D.

Acrolein is rapidly metabolized by organisms and does not bioaccumulate. Based on the high water solubility, low octanol/water partition coefficient (Kow), and high reactivity of acrolein, uptake by organisms is predicted to be low. Based on the low reported bioconcentration factors, acrolein is unlikely to bioaccumulate or bioconcentrate significantly in aquatic organisms (Howard, 1989; ATSDR, 1990; DFO, 1995; Nordone et al., 1996b; as cited in International Programme on Chemical Safety).

There is acceptable data however, that indicates that acrolein is very highly toxic to freshwater fish and invertebrates. The lowest LC50 value of 14 ppb has been established for white sucker and the fathead minnow, and 22 ppb for bluegill sunfish (Turner and Erickson, 2003). Given that acrolein is highly toxic, the question of risk for a chemical of this nature relates far more to exposure than to determining an exact LC50 for the most sensitive species. Because acrolein appears to be of comparable toxicity to fish and to aquatic invertebrates, it does not appear that indirect effects on the invertebrate food supply of fish are as much of a concern as the direct toxicity to the fish. While several reports of fish kills have been associated with acrolein, it appears that these occurred as a result of misuse. Some examples of misuse are the release of water too early from the canal, leaky gate valves or gate valves not being closed properly, or gates being opened by an applicator too soon. Several incidents also resulted from the removal of boards that contain the irrigation water that were removed by children playing.

Products containing acrolein typically contain several "inert" ingredients in their formulations. All of these except for one are considered impurities in the manufacturing process and are therefore part of the technical material. The only added "inert" ingredient is hydroquinone, which is added at 0.25% to inhibit spontaneous reactivity of the acrolein. Hydroquinone is a "list one" ingredient, which means that it is of toxicological concern and is required to be listed on the label (and is therefore not "confidential"). The fate and transport of hydroquinone in the environment is unknown (Turner and Erickson, 2003).

In sediment/water systems, acrolein undergoes hydrolysis, self-oxidation, and biodegradation. Because of its low organic carbon/water partition coefficient (Koc) and high water solubility, acrolein is not expected to significantly adsorb to suspended solids or sediments, nor are these suspended solids or sediments expected to significantly absorb acrolein from water (Irwin, 1988; Howard, 1989; as cited in IPCS, 2002).

In hydrolysis studies acrolein has a half-life of 92 hours at pH 5, 37 hours at pH 7, and 19 hours at pH 9. The reported ½-life persistence of acrolein in freshwater is usually less than 50 hours (Eisler, 1994; as cited in Turner and Erickson, 2003). In waters where acrolein is used routinely or periodically, some microbial components apparently acclimate to acrolein toxicity, and biodegradation occurs. A 100% degradation of acrolein in 7 days is reported in one study, and 30-42% degradation in two other studies, with the initial concentration being the factor that accounts for the different results. The relatively short observed half-life of acrolein in surface waters makes long-range aquatic transport unlikely.

In summary, the maximum concentration according to the label should be not more than 15 ppm. The application concentration may be lower if weeds are relatively small and mostly submerged, and if acrolein is put into the water over a longer period of time. The concentration does need to be proportionately higher at lower water temperatures to maintain efficacy. Under no circumstances should the concentration exceed 15 ppm. Lower concentrations are typical when acrolein is used as part of a preventative maintenance approach when treating weeds and algae before they grow too large, and is more efficient and economical than waiting until there is sufficient growth which warrants using higher concentrations to obtain control.

The federal label allows acrolein use only in irrigation supply canals, and irrigation drain canals are not to be treated. Thus, there would be no use in waters draining into fish-bearing waters. Applications are allowed into 'impounded waters' in California, but these waters are not to be drained into fish bearing waters (Turner and Erickson, 2003). The product label of Magnacide H states that water treated with Magnacide H can be used to irrigate fields or, if not, must be held for 6 days before being released into fish-bearing waters or where it will drain into them. On the label for Magnacide H (Appendix F), the "DIRECTIONS FOR USE" state:

"Water treated with Magnacide H Herbicide must be used for irrigation of fields, either crop bearing, fallow or pasture, where the treated water remains on the field OR held for 6 days before being released into fish bearing waters or where it will drain into them."

The six-day holding time required by the label is almost three times as long the dissipation rate. Most of all fish kills from acrolein occurred when treated water was discharged without a holding period or when fish inhabited the treated irrigation canals. Fish screens, installed according to National Marine Fisheries Service (NMFS) standards, is one measure that would prevent fish from inhabiting treated canals, since fish not in the canals should not be affected from legal registered uses.

2.7 Best Management Practices (BMP's)

Best Management Practices (BMP's) are project techniques and management practices that ensure the protection of the environment with a focus on preserving water quality in lakes, rivers, and streams, while still allowing the productive use of resources. These common-sense actions are required by law, and are designed to protect water quality by keeping soil and other pollutants out of streams and lakes. Nationally recognized

BMP's for aquatic herbicide applications exist to protect or restore fish and wildlife habitat. It is believed that the quality of aquatic habitats can be maintained while allowing for aquatic plant population management (AERF, 2003).

Recent research has indicated that an integrated approach to aquatic weed control may be the best method of controlling aquatic vegetation while maintaining a healthy aquatic ecosystem. Some important steps in this approach are listed below:

- Correctly identify the invasive plant
- Determine how plant was introduced to prevent re-introduction
- Establish tolerable levels of any single plant species
- Make decisions based on site specific information
- Use ecosystem, watershed, and cost perspectives to determine long-term management strategies
- Develop a system of integrated control methods, including mechanical, cultural, biological, and chemical BMP's
- Assess the results of the weed control program, to include quantitative documentation of the results of all control strategies and reevaluating management options

NID will comply with the all of the BMP's listed in the following sections.

2.7.1 BMP's specific to NID

The following BMP's will be adopted by NID to address environmental concerns associated with the application of aquatic herbicides.

- In priority canals, pre-applications inspections will take place to determine the presence/absence of the California Red Legged Frog (*Rana aurara draytonii*), Foothill Yellow Legged Frog (*Rana boylii*), Western Pond Turtle (*Clemmys marmorata* sp.), Chinook salmon (*Oncorhynchus tshawytscha*) and Steelhead (*Oncorhynchus mykiss*). In the event that any of these species are observed in the area of application, no herbicide applications will take place.

- Prior to applications of copper sulfate, Cutrine-Plus, and Clearigate, the alkalinity of the water will be determined. The alkalinity data will be used to determine the appropriate concentration of copper allowable to minimize impacts to aquatic life.

- Prior to herbicide use, a calculation of herbicide concentrations in the receiving waterbody will ensure compliance with regulations.

- No glyphosate will be used within 50 feet of elderberry shrubs (*Sambucus mexicanus*).

- Water treated with copper sulfate will not be discharged into creeks or streams.

- The discharge of treated water into natural creeks and streams will be minimized. Treated water may be released for agricultural uses such as irrigation, but only when conveyed via man-made canals or waterways.

- None of the raw water treated with herbicides is to be discharged to treatment plants.

- Glyphosate will not be used when winds exceed 10 mph. This will be determined with an on-site hand-held wind meter.

- Aside from water released for agricultural irrigation, acrolein will be held for at least 6 days prior to release.

2.7.2 *Label Requirements*

All herbicide containers must have an EPA-approved label. The label requirements are designed to protect the health of the environment, humans using that environment, and the applicators of the herbicide. The herbicide label contains a great deal of information about the product and should be read thoroughly and carefully before each use, as the labels are constantly changing. Information contained on pesticide labels include the name of chemical, EPA registration number, amount of active ingredient per unit, manufacturer name and contact information, use classification, use recommendations, pests controlled by pesticide, precautionary statements, persistence half-life, and toxicity. In addition, the label also contains information on how to store, mix, apply and dispose of the product.

The label represents a legal document and is considered part of compliance with FIFRA and other Federal regulations. Applicators are required to adhere to of all instructions/precautions listed, and if they do not, are subject severe penalties. It is unlawful to alter, detach, or destroy the label, or to transfer herbicides to an improperly labeled container, or to use a pesticide in a manner that is inconsistent with or not specified on the label. Misuse of a herbicide is not only a violation of federal and state law, but also herbicides used in water contrary to label directions may make water unfit for fishing, irrigation, swimming, or domestic use. Most states require that only those individuals that have been trained and have an applicator license apply aquatic herbicides. In addition, most states require permits or have regulatory requirements for the use of herbicides in aquatic environments.

The label can help applicators determine the following:

- Is the product labeled for the site, i.e., ditch banks only, canal banks, ponds, lakes, rivers, etc.?
- Can the weed be controlled with the product?
- Can the herbicide be used safely under particular application conditions?
- How much herbicide is needed?
- What restrictions apply to watering livestock, fishing, swimming, consuming as potable water and irrigation?
- What is the toxicity to fish and nontarget vegetation?
- When should the herbicide be applied (time of year, stage of plant growth, etc.)?
- Is the herbicide classified for restricted use?
- What is the signal word? (DANGER, WARNING, CAUTION)
- What safety equipment should be worn?

All appropriate labels should be kept at the application site, including supplemental labels, special local need labels and emergency use labels. Manufacturers material safety data sheets (MSDS) should also be kept on hand. Labels should be read often even if used routinely as something could have been missed or it may have changed (Langeland and Thayer, 1998). Labels for all of the herbicides used by NID are attached in Appendix F.

2.7.3 BMP's for pesticide application, storage, and disposal

The following section describes standard Best Management Practices that can be used during pesticide applications, storage and disposal.

General

- Aquatic herbicides should be applied according to the regional Public Health Code.
- Educating all personnel who will be involved with the herbicide applications is necessary, as well as the utilization of appropriate protective equipment to minimize exposure.
- Perform site inspections to determine the need for treatment, type and intensity of treatment needed, and potential water quality impacts.
- Evaluate factors immediate to treatment such as day length, precipitation, recreational activity, sunlight, water depth, water flows, water turbidity, and wind. Reschedule application if increased water quality impacts will result.
- The action threshold should be determined which is the density at which action must be taken to prevent problems. The best strategy is to choose an herbicide that will most effectively control the target organisms while minimizing the potential for adverse effects to the environment. Some things to consider are the herbicides half-life, toxicity value and pest resistance.
- Always follow label instructions, and read the label before applying. Apply in a manner that maximizes the percentage of material on-target, and minimize potential off-target effects.
- Ensure equipment is in sound mechanical condition, free of leaks or defects. Application equipment should be calibrated frequently to ensure proper and safe application and to comply with label directions.
- Post public notices in any areas that are publicly accessible. Notify adjacent residents prior to herbicide applications via mailings, flyers, or phone calls. Include the schedule for the whole season, areas to be treated, and contact information.

Mixing and Loading

- Always wear protective clothing when mixing and applying pesticides.
- Mix chemicals away from people and animals, on an impermeable surface, preferably on a sealed concrete pad. The pad should drain to a sump which can contain any spilled pesticides.
- Never leave the filling operation unattended.
- Have spill material available to contain potential spills.

- Accurately measure chemicals in accordance with label directions. If measuring in teaspoons, use level spoonfuls, not heaping spoonfuls. Never use the same measuring device for food preparation.
- If the tank is used to mix two or more chemicals, be sure they are compatible with each other. When mixing 2 or more chemicals in a tank, be sure to mix according to the label instructions.
- Pesticide application equipment designed to draw water must have a properly functioning anti-siphoning device. Avoid back-siphoning by keeping the end of the fill hose above the water level, or by installing devices which prevent back-siphoning.

Application Procedures

- If a restricted use pesticide is used, you MUST have the credentials to use it (Applicator Certification and Registration).
- Pesticide applications should be made in a way that will reduce drift.
- Avoid application during heavy winds (not to exceed 10 mph; use a handheld wind meter to determine wind speed and record on pesticide use record sheet).
- When spraying, leave an unsprayed buffer strip around surface waters or near other sensitive areas.
- Always spray at the rate recommended on the label; on the advice of experts, you may be able to apply less than the recommended rate.
- Apply pesticides in a manner that minimizes exposure to humans, livestock, domestic animals and non-target wildlife.
- Use up excess pesticide mixtures according to label directions.
- Perform post-treatment assessments to observe visible water quality impacts. The results of this assessment should be evaluated to refine future applications. Record any abnormalities observed (i.e. impacts on non-target organisms – fish kills) and report to appropriate authority (DFG).

Pesticide Storage

- Store all pesticides away from food products, seeds, fertilizer, and protective equipment.
- Store all pesticides in a cool, dry location, out of direct sunlight. Ideally pesticides should be stored in a secure room/building. Buildings should be located no closer than 150 feet from a well and no closer than 200 feet from surface water (lake, river, stream, or wetland). If this is not possible additional water source protection methods should be used.
- In the building/room where pesticides are stored:
    - Post the room/building with highly visible warning and "NO SMOKING" signs.
    - The room/building should be properly ventilated with an exhaust fan.
    - Room/building should contain a sealed concrete floor that will prevent spilled pesticides from leaking through cracks.

- Where possible, the room/building should be fireproof and explosion proof.
- The room/building should be locked when not in use. Keep all pesticides out of the reach of children, pets and unauthorized persons.

- If pesticides are stored in a separate building, there should be a containment dike around the building to prevent potential runoff. The room should contain metal shelves for smaller containers and pallets on the floor for large drums.
- Store all pesticides in their original container. Secondary containment should be provided for all pesticide containers.
- Store all pesticides by classification (herbicide, fungicide, etc.) to prevent misuse or contamination.
- Mark the date of purchase on each container so older material can be used first.
- Have supplies for clean-up of spills readily available. These include kitty litter, sawdust, and buckets. A fire extinguisher approved for chemical fires should also be readily accessible.
- Have emergency phone numbers visibly posted, and first aid equipment readily available.
- Store protective clothing in a location separate from the pesticides.
- Store equipment for measuring and mixing pesticides in the pesticide storage room/building.
- Do not store pesticides in underground tanks.

Pesticide Disposal

- Read the label for disposal instructions.
- Do not discard partially filled pesticide containers in the trash
- Before disposing of empty pesticide containers, triple rinse or power rinse the container. If conducted at a common site, the rinsing operation should be performed over an impervious pad; otherwise the operation should occur in the filed at the time of application. To triple rinse, follow steps below:
  - Allow concentration to drain into the tank for 30 seconds.
  - Add water to the container (10% of volume), replace lid and rotate container.
  - Dump rinse into tank and drain for 30 seconds.
  - Repeat twice and use the rinseate according to the label directions.
- It is critical that pesticide containers are rinsed immediately after they are emptied. Once the pesticide residues become dry in the containers, they are difficult to remove.
- Puncture the container so it is not used for other purposes.
- Where possible, recycle plastic containers.
- Dispose of glass containers in a sanitary landfill.
- Never reuse a pesticide container.

- Open burning of pesticide containers is prohibited by law.

Spill cleanup

- Develop a spill response plan to identify procedures which will be followed to contain and clean up spills.
- If spill occurs indoors and the area drains to a sanitary sewer:
    - If pesticide is a liquid, surround the area with an absorbent material to keep the pesticide from moving.
    - If pesticide is a liquid, sprinkle sawdust, kitty litter or other absorbent materials over the spill. Wear gloves and rubber boots.
    - Collect the absorbent material and read label directions for proper disposal of the waste.
    - After removing waste material, contact the wastewater treatment operator. Upon their approval, wash the area down with water, again, only if the area drains to a sanitary sewer. Do not wash into a storm sewer.

Record keeping

The pesticide applicator should record pesticide applications in a Pesticide Use Record. Include date of application, chemical applied, rate per acre, method of application, area treated with pesticides, purpose of application (target pests), weather conditions at time of application, most recent date of calibration, and name of applicator. Keep on file for at least three years along with copies of labels.

Maintenance

- Ongoing maintenance should include a minimum annual check to ensure:
    - Applicators are applying pesticides according to label directions.
    - Equipment is calibrated so that pesticides are applied at the appropriate rate.
    - Labels on pesticide containers are legible.
    - Pesticides are being stored according to label directions, and that there is secondary containment for all pesticides.
    - Records are being kept which accurately document the use and application of the pesticide.

Transporting pesticides

When transporting pesticides be sure to secure containers to avoid breakage and leakage, and use packaging containers to avoid contamination with other chemicals.

Applicator Certification/Registration

Anyone purchasing and applying restricted use pesticides must be certified via a testing procedure. Recertification is required every three years.

2.8 Other Project Approvals

In addition to the approval of the proposed project by the Nevada Irrigation District Board of Directors, the project may also require approvals, permits, authorizations and/or other agreements from Federal, State and Local agencies. It is anticipated that the General Permit will require annual reporting. Any other approvals, permits, authorizations and/or other agreements not listed above that may be required will be obtained by NID as part of implementation of the project.

3.1 Aesthetics

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Have a substantial adverse effect on a scenic vista?	☐	☐	☐	☒
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	☐	☐	☐	☒
c) Substantially degrade the existing visual character or quality of the site and its surroundings?	☐	☐	☐	☒
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The Nevada Irrigation District operates and maintains 151 canals with a total length of 420 miles within Nevada, Placer, and Yuba counties (Figure 1 — Nevada Irrigation District Service Area and Herbicide Application Sites). These canals function to supply water to approximately 5200 irrigation customers, and serves as a conduit of water to the Districts 8 water treatment plants serving approximately 17,000 customers. The majority of the canals are located near agricultural areas, rural residential, and within forested or open areas. Portions are also routed through urban areas, along roadsides, and private property. The Nevada Irrigation District, Aquatic Weed Management Program has several herbicide application sites. The herbicide application sites are located near rural residential communities, farms, housing developments, and open space. The herbicides are applied directly into the canal via a controlled drip box, hand-held sprayer, or hose. Most of the application sites are located within the lower range of the Sierra Nevada foothills and extended to the sites near the California Central Valley.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts to aesthetics and visual resources would normally be significant if the project would:

Adversely affect a scenic vista;

Substantially damage scenic resources;

Substantially degrade the existing visual character or quality of the site or its surroundings;

Create a new source of substantial light or glare

DISCUSSION OF IMPACTS

a) Have a substantial adverse effect on a scenic vista?

This project relates to the application of aquatic herbicides. Designated scenic vistas in the project vicinity will not be affected. Therefore, the proposed project would not have a substantial adverse effect on scenic vistas, and no impact would occur.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

This project pertains to aquatic herbicide applications conducted by NID and does not contain any constructional elements. No significant rock outcroppings or historic buildings will be damaged as a result of this project. As such, no impact to scenic resources will occur.

c) Substantially degrade the existing visual character or quality of the site and its surroundings?

The project pertains to aquatic herbicide applications and will not substantially degrade the existing visual character or quality of the site and its surroundings. Relevant structures include preexisting canals and waterways, which are not going to be altered as part of this project. Existing visual character of the project area will not be impacted by the project. Therefore, no impact to visual character or quality of the site and its surroundings will occur.

d) Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

No additional sources of lighting are going to be installed as part of the Aquatic Weed Management Program. As such, no impacts from light or glare are anticipated to adversely affect day or nighttime view in the area.

CONCLUSION

By having no impact on scenic vistas, and scenic resources, the project is compatible with the current use, vistas, and scenic resources of the affected environment.

3.2 Agricultural Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	☐	☐	☐	☒
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?	☐	☐	☐	☒
c) Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The California Department of Conservation's Farmland Mapping and Monitoring Program (FMMP) produces maps and statistical data used for analyzing impacts on California's agricultural resources. The FMMP Important Farmland Map for Nevada, Placer, and Yuba counties includes classifications for urban/built up land, grazing land, prime farmland, farmland of statewide importance, unique farmland, farmland of local importance, water and other lands. The project site is not designated prime farmland, farmland of statewide importance, unique farmland, or farmland of local importance on the FMMP map Nevada, Placer, and Yuba counties. Properties utilized for agricultural purposes are located within or adjacent to the proposed project.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts to agricultural resources would normally be significant if the project would:

Convert state designated Prime Farmland, Unique Farmland, or Farmland of Statewide Importance to non-agricultural use;

Conflict with existing County zoning for agricultural use, or conflict with land under a designated Williamson Act contract; and

Involve changes to the existing environment, which, due to the location or nature of the changes, could result in conversion of Farmland to non-agricultural use.

DISCUSSION OF IMPACTS

a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance?

The project consists of management measures to control vegetation and will not result in converting any land, farmland or otherwise. Existing facilities located in the project area are those that are utilized for the purpose of conveying irrigation water. Waters delivered to existing farms help to maintain their existence. Since no conversion of agricultural lands to non-agricultural lands will take place no impact will occur.

b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

The proposed Aquatic Weed Management Program will not conflict with existing zoning for agricultural uses or a Williamson Act contract. Therefore, no impact would occur.

c) Involve other changes in the existing environment, which due to their location or nature, could result in conversion of Farmland, to non-agricultural use?

The proposed Aquatic Herbicide Weed Management program is not anticipated to change the existing environment in a manner that could result in conversion of farmland. Therefore, no impact will occur.

CONCLUSION

The project will not introduce any changes that will result in the conversion of Farmland to non-agricultural use. The project has no significant impacts on agricultural resources and therefore no mitigation is required.

3.3 Air Quality

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Where available, the significance criteria established by the applicable air quality management or air pollution control district is relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	☐	☐	☐	☒
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	☐	☐	☐	☒
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is in non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors)?	☐	☐	☐	☒
d) Expose sensitive receptors to substantial pollutant concentrations?	☐	☐	☐	☒
e) Create objectionable odors affecting a substantial number of people?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The U. S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) has established ambient air quality standards for common pollutants (Table 6 — Federal and State Ambient Air Quality Standards). These ambient air quality standards are levels of contaminants, which represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. The California Air Resources Board in conjunction with the Feather River Air Quality Management District (FRAQMD), Northern Sierra Air Quality Management District (NSAQMD), and Placer County Air Pollution Control District (PCAPCD) operates air quality monitoring stations within the region that monitor the level of criteria pollutants in the atmosphere.

The project is located within two air basins, the Sacramento Valley Air Basin (Yuba and Placer counties) and the Mountain Counties Air Basin (Nevada and Placer counties). Sacramento Valley Air basin (SVAB) is a broad, flat valley bounded by the Coast Ranges to the west and the Sierra Nevada to the east. The entire air basin is about 200 miles long in a north-south direction, and has a maximum width of about 150 miles, although the valley floor averages only about 50 miles in width. The SVAB is bounded on the north by the Cascade Range, on the south by the San Joaquin Valley Air Basin, on the east by the Sierra Nevada, and on the west by the Coast Range.

The project site is located within the portion of the Sierra Nevada Foothills that is situated within the Mountain Counties Air Basin (MCAB) which includes portions of Plumas, Sierra, Nevada, Placer (middle portion),El Dorado (western portion), Amador, Calaveras, Tuolumne, and Mariposa counties. The MCAB lies along the northern Sierra Nevada mountain range, close to or contiguous with the Nevada border, and covers an area of roughly 11,000 square miles. The prevailing wind is southwesterly and air pollution generally moves west to east through the air basin.

Air quality concerns in these counties include the most common pollutants including ozone, particulate matter from dust and diesel exhaust, and state defined Toxic Air Contaminants (TAC's). Two TAC's which are of concern in the county are diesel exhaust particulates and naturally occurring asbestos.

The U. S. Environmental Protection Agency (EPA) and the California Air Resources Board (CARB) has established ambient air quality standards for common pollutants (Table 6 — Federal and State Ambient Air Quality Standards). These ambient air quality standards are levels of contaminants, which represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents.

Table 6 — Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone 1-Hour	1-Hour 8-Hour	0.12 ppm 0.08 ppm	0.09 ppm --
Carbon Monoxide	8-Hour 1-Hour	9.0 ppm 35.0 ppm	9.0 ppm 20.0 ppm
Nitrogen Dioxide	Annual 1-Hour	0.05 ppm --	-- .25 ppm
Particulate Matter (PM10)	Annual 24-Hour	50 ug/m3 150 ug/m3	30ug/m3 50 ug/m3

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts to air quality would normally be considered significant if the project would:

Conflict or obstruct the implementation of an air quality plan;

Result in ambient pollutant concentrations of PM10, Co, SO2 and NOX from construction or operational emissions that are in excess of applicable National or state Ambient Air Quality Standards;

Expose sensitive receptors to substantial pollutant concentrations; or

Create objectionable odors affecting a substantial number of people.

DISCUSSION OF IMPACTS

In the NID Aquatic Weed Management Program, the herbicides are applied directly to plants and the water within the irrigation canals, and not applied if wind speeds exceed 10 m.p.h. Given these site-specific applications, the potential for air borne chemicals is low.

a) **Conflict with or obstruct implementation of the applicable air quality plan?**

None of the herbicide application activities of NID are expected to result in conflicts with or obstruct the implementation of applicable air quality plans. Thus, the project is expected to have no impact.

b) **Violate any air quality standard or contribute substantially to an existing or projected air quality violation?**

The activities of the NID Aquatic Weed Management Program are not expected to violate any air quality standards or to contribute substantially to any existing or projected air quality violations. No impact.

c) **Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?**

Activities of the NID Aquatic Weed Management Program will not result in any cumulative increase of criteria pollutants for PCAPCD, FRAQMD, or NSAQMD for non-attainment or federal or state ambient air quality standards (including emissions which exceed quantitative thresholds for ozone precursors). No impact.

d) **Expose sensitive receptors to substantial pollutant concentrations?**

None of the activities of the Aquatic Weed Management Program operated by NID will expose sensitive receptors to substantial pollutant concentrations. No impact.

e) **Create objectionable odors affecting a substantial number of people?**

The application of aquatic herbicides by NID will not create objectionable odors that will affect a substantial number of people, so there will be no impact.

CONCLUSION

The NID herbicide application activities of the Aquatic Weed Management Program will not violate air quality standards, plans, or requirements of the local Air Quality Management Districts.

3.4 Biological Resources

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☒	☐	☐
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	☐	☐	☐	☒
c) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.), through direct removal, filling, hydrological interruption or other means?	☐	☐	☐	☒
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?	☐	☐	☐	☒
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?	☐	☐	☐	☒
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?	☐	☐	☐	☒

METHODOLOGY

BACKGROUND

Available information pertaining to the natural resources of NID was reviewed. These documents include: a list of special-status plant and wildlife species from the U.S. Fish and Wildlife Service (USFWS) for the Nevada, Placer, and Yuba counties, the USFWS National List of Plants that Occur in Wetlands, and the Jepson Manual: Higher Plants of California (Hickman 1993).

ENVIRONMENTAL SETTING

The affected environment includes the canals that are treated with herbicides, agricultural lands that are irrigated, and the water bodies that are located downstream of the treated canals. Habitat types occurring within the study area include agricultural, annual grassland, canal, horticultural/ landscaped, and riparian. Additionally, wetlands, stock ponds, and ornamental ponds occur in agricultural and riparian areas.

Agricultural

The predominant habitat type in the study area is consistent with agricultural land uses. Fallow agricultural fields, consisting primarily of ruderal vegetation, annual grassland vegetation, irrigated pastures, orchards, and horticultural operations are located in the study area.

Annual Grassland

Annual grassland habitat occurs interspersed throughout the study area. Species expected to occur in this habitat include pasture grasses, weeds, and forbs. Additionally, native tree species include valley oaks, blue oaks, and willows.

Canals

Canals occur throughout the project area and are the sites of direct herbicide application. These canals convey agricultural and residential water to customers located within the District. Some of the canals are lined with concrete or gunite, but generally they are unlined structures with an earthen substrate. Canals are steep-sided with little vegetation occurring within the channels except where sediment build-up has enabled establishment of emergent and aquatic vegetation. Vegetation outside of the canals includes species occurring in the agricultural, grassland, horticultural/landscaped, and riparian habitats in the study area. The canals flow into ditches, ponds reservoirs, or streams, which are be found throughout the NID.

Horticultural/Landscaped

Horticultural/landscaped habitat occurs throughout the study area in association with rural and urban residences and commercial lots. Non-native plant species are incorporated into the landscape design of these areas.

Riparian

Riparian habitat occurs adjacent to many of the canals and waterways operated by NID. Riparian habitat supports a diversity of plant species that have adapted to wet soil conditions found adjacent to waterways. Species expected to occur in this habitat include blackberry, broad-leaved cattail, cluster dock, curly dock, narrow-leaved cattail, sedges, and rushes. Additionally, native tree species were observed in this habitat in the study area, including oak, cottonwood, and willow.

Wetlands

Wetlands occur in agricultural and annual grassland habitats in the study area. Vegetation in these areas varies from ruderal herbaceous species such as dove weed, tarweed, and cranesbill to seasonal wetland species such as fiddle dock, Mediterranean barley, mint, sedges, and rushes.

Wildlife Species

Wildlife species expected to occur in the study area include American crow (Corvus brachyrhynchos), red-tailed hawk (Buteo jamaicensis), western scrub jay (Aphelocoma californica), yellow-billed magpie (Pica nuttalli), American kestrel (Falco sparverius), Cooper's hawk (Accipiter cooperii), red-winged blackbird (Ageleaius phoeniceus), Swainson's hawk (Buteo swainsoni), coyote (Canis latrans), and raccoon (Procyon lotor).

SPECIAL-STATUS SPECIES

Special-status species that are listed on the USFWS list for Nevada, Placer, and Yuba counties are found in Appendix B. Many of these special status species are not typically found in the affected environment. Examples include upland plant species and raptors that forage and nest in upland areas, and flora and fauna that only occur above 3,500 feet MSL.

Special status species that may occur in the affected environment include wetland and riparian vegetation, fish, amphibians, aquatic invertebrates, upland invertebrates, birds, and aquatic reptiles. Only those organisms that are exposed to relatively high concentrations of the herbicides may potentially be significantly affected.

Wetland and riparian plant species, such as Bogg's Lake hedge-hyssop and Hispid bird's beak have specific habitat requirements and are not likely to be found in irrigation canals and similar structures. For the same reason, aquatic invertebrates, such as amphibious caddisfly and vernal pool fairy shrimp are not likely to be exposed to relatively high concentrations of the herbicides because they do not typically occur in canals.

Special status bird species, such as Aleutian Canada goose, American bittern, and greater sandhill crane may feed and nest in wetland areas but are unlikely to do so in irrigation canals. These wildlife species may be exposed to sediments in wetlands and agricultural areas that could contain elevated levels of copper as a result of herbicide applications. The levels of copper are low and generally considered to not be bio-available.

The listed species of invertebrate that may occur in the affected environment is the valley elderberry longhorn beetle. This species is associated with its host plant, the elderberry shrub (Sambucus mexicanus). Impacts to this shrub and to the beetle will be avoided by not using herbicides within 50 feet of any shrubs that may occur in the affected environment.

The species most likely to be affected by herbicides are those that could occur in the canals that are receiving herbicide applications. These are the fish, amphibian, and aquatic reptile species: Chinook salmon, steelhead trout, California red-legged frog, foothill yellow-legged frogs, and northwestern pond turtles. Significant impacts to these species will be avoided by conducting pre-application surveys in those canal systems in which these species are most likely to occur.

SENSITIVE HABITATS

Sensitive habitats include those that are of special concern to resource agencies or those that are protected under Section 404 of the Clean Water Act, Section 1600 et seq. of the California Fish and Game Code, or California Environmental Quality Act (CEQA). Additionally, sensitive habitats are protected under the Yuba, Nevada, and Placer

County General Plans. Sensitive habitats occurring in the project area include potential waters of the U.S. (includes wetlands), native oak trees, wildlife migration corridors, and riparian habitat.

CRITERIA FOR DETERMINING SIGNIFICANCE

The criteria utilized to determine the project's impacts on biological resources were based on federal, state, and local requirements, regulations, and policies (including the Federal Endangered Species Act (FESA), California Endangered Species Act (CESA), CEQA, and the California Fish and Game Code. An impact is considered significant if it would:

Substantially reduce the habitat of any fish or wildlife species;

Cause a fish or wildlife population to drop below self-sustaining levels;

Threaten to eliminate a plant or animal community;

Reduce the number or restrict the range of an endangered, rare or threatened species;

Cause a substantial adverse impact, either directly or through habitat modifications, on any species not formally listed under ESA or CESA as "endangered," "threatened," or "rare" but identified as a candidate, sensitive, or special stats species in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;

Cause a substantial adverse impact on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Game or U.S Fish and Wildlife Service;

Adversely impact federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) either individually or in combination with the known or probable impacts of other activities through direct removal, filling, hydrological interruption, or other means;

Interfere substantially with the movement of any resident or migratory fish or wildlife species or with established resident or migratory wildlife corridors, or impede the use of wildlife nursery sites;

Conflict with any local policies or ordinances protecting biological resources, such as tree preservation policy or ordinance; or

Conflict with any of the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

DISCUSSION OF POTENTIAL IMPACTS

a) **Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?**

Listed and Special-Status Amphibian/Reptile Species

California Red-Legged Frog (*Rana aurora draytonii*)

California red-legged frog (*Rana aurora draytonii*) is endemic to California and Baja California, Mexico. CRLF are federally listed as threatened and are a state species of concern. They utilize a variety of habitats including various aquatic, riparian, and upland habitats below 5,200 feet (Jennings & Hayes, 1994); nearly all sightings have occurred below 3,500 feet (USFWS, 2002). Although the use of upland habitats by CRLF is not well understood, during periods of wet weather, this species is known to make movements through upland habitats (USFWS, 2002). CRLF rarely occur far from water during dry periods. Deep (greater than 2 feet) still or slow moving water and dense, shrubby riparian or emergent vegetation is necessary for the deposition of eggs (USFWS, 2002).

Foothill yellow-legged frogs (*Rana boylii*) are federal species of concern and state species of concern that inhabit perennial streams with cobble substrate. FYLF may possibly occur in the waterways within the affected environment.

The following mitigation measure shall be implemented to reduce impacts to CRLF and FYLF to less than significant:

Mitigation Measure # 1

Pre-application surveys will be implemented in those areas most likely to have occurrences of CRLF or FYLF. These surveys will be conducted prior to herbicide applications to determine the presence/absence of either species. To reduce direct impacts to these amphibians, herbicides will not be used in those areas of occurrence.

Northwestern Pond Turtle (*Clemmys marmorata marmorata*)

The western pond turtle (*Clemmys marmorata*) occurs from the vicinity of the American River in California northward to the lower Columbia River in Oregon and Washington. Northwestern pond turtles are habitat generalists and occur in a wide variety of permanent or nearly permanent aquatic habitats, normally ponds, lakes, streams and irrigation ditches, with basking sites such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks (Zeiner et al., 1988). Aquatic sites are usually left to reproduce, aestivate, and overwinter in upland habitats such as annual grasslands and oak woodlands (Jennings & Hayes 1994).

The following mitigation measure shall be implemented to reduce impacts to northwestern pond turtle to less than significant:

Mitigation Measure # 2

Pre-application surveys will be implemented in those areas most likely to have occurrences of NW pond turtles. To reduce direct impacts to NW pond turtles, herbicides will not be used in those areas of occurrence.

Listed and Special-Status Fish Species

Chinook and steelhead are salmonids found in some tributaries of the Sacramento and American Rivers. They may occasionally occur in canal systems

to which they have access, and potentially be affected by herbicide levels in those canals systems. The following mitigation measure shall be implemented to reduce impacts to salmonids to less than significant:

Mitigation Measure # 3

Pre-application surveys will be implemented in those areas most likely to have occurrences of salmonids. To reduce direct impacts to salmonids, herbicides will not be used in those areas of occurrence. In canals where acrolein is used the waters will held for a minimum of 6 days prior to release into natural waterways. Acrolein treated water may be released sooner for agricultural irrigation as long as it does not intercept natural waterways.

Listed and Special-Status Invertebrate Species

Valley elderberry longhorn beetle may occur in riparian areas in their host plant, *Sambucus mexicanus*. The following mitigation measure shall be implemented to reduce impacts to this invertebrate species to less than significant:

Mitigation Measure # 4

Elderberry shrubs located in the vicinity of canals that receive herbicide applications will be inventoried and mapped. No glyphosate will be used within 50 feet of these shrub locations.

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Important Biological Communities

Riparian habitat occurs adjacent to portions of the canals in the project area. This important habitat is recognized as a significant resource in the Nevada County General Plan and is a concern to the CDFG. Herbicides will be applied directly within the banks of canals and no herbicides will be applied to riparian vegetation. This will avoid any impacts to riparian vegetation and habitat functions.

c) Have a substantial adverse effect on federally protected wetlands, as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal wetlands, etc.), through direct removal, filling, hydrological interruption or other means?

The affected environment contains jurisdictional waters of the U.S., including wetlands. These wetlands are regulated by the U.S. Army Corps of Engineers (Corps) and CDFG. However, no filling, dredging, or alteration of wetland hydrology is anticipated. Herbicides will be applied directly within the banks of canals and no herbicides will be applied to wetlands. This will minimize any impacts to wetland vegetation and habitat functions. Therefore, no significant impacts to wetlands will occur.

d) **Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?**

The proposed project is not anticipated to interfere with the movement of native or migratory fish or wildlife species or affect established native resident or migratory wildlife corridors. The project consists of maintaining existing canals and water conveyance systems. Therefore, minimal impact to the ability of native or migratory fish or wildlife species to migrate would occur as a result of the proposed project.

e) **Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?**

Herbicides will be applied directly within the banks of canals and no herbicides will be applied to riparian vegetation. This will avoid any impacts to native trees including oaks and landmark and heritage trees, riparian vegetation, and riparian habitat functions.

f) **Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional or state habitat conservation plan?**

There are no adopted Habitat Conservation Plans, Natural Community Conservation Plans or other approved local, regional, or state habitat conservation plans for the project area. Therefore, no impact would occur as a result of project construction.

CONCLUSION

The impacts to biological resources include potentially significant impacts to special status species and/or their habitats. Mitigation measures for special status species and their associated habitat include pre-application habitat assessments and surveys by a qualified biologist, and avoidance. The potential impacts to listed fish and wildlife species are to be mitigated by these avoidance and minimization measures. No important biological communities, wetlands, fish and wildlife corridors, native or heritage trees, or Habitat Conservation Plans will significantly be affected by the NID Aquatic Weed Management Program. Mitigation Measures #1 through #4 will reduce the impacts to biological resources to less than significant.

3.5 Cultural Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?	☐	☐	☐	☒
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?	☐	☐	☐	☒
c) Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?	☐	☐	☐	☒
d) Disturb any human remains, including those interred outside of formal cemeteries?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

HISTORIC RESOURCES

Properties of historical significance in California are designated in one of three state registration programs: State Historical Landmarks, Points of Historical Interest, and the California Register of Historic Place. The California Department of Parks and Recreation Office of Historic Preservation is the governmental agency responsible for administering the historic preservation program in California including oversight of the designation program and maintenance of the list of registered sites. All sites registered with the Office of Historic Preservation are tracked by listing number.

Cultural resources can include historic and archaeological objects, structures, records, and sites which are associated with past human activities. A substantial adverse change in the significance of an historical resource means the physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired. (Section 15064.5 (b) (1), CEQA Guidelines).

Per the CEQA Guidelines, historical resources include the following:

- A resource listed in, or eligible for listing in, the California Register of Historical Resources (California Pub. Res. Code SS5024.1, Title 14 CCR, Section 4850 et seq.)
- A resource included in a local register of historical resources, as defined in Section 5020.1(k) of the Public Resources Code
- Any object, building, structure, site, area, place, record, or manuscript, which:
  a) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
  b) is associated with the lives of persons important in our past;

c) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic value; or
d) has yielded, or may be likely to yield, information important in prehistory or history.

Per Public Resources Code Section 21983.2(g), an archaeological resource shall be considered unique if "it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

- Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
- Has a special and particular quality such as being the oldest of its type or the best available example of its type.
- Is directly associated with a scientifically recognized important prehistoric or historic event or person."

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts to cultural resources would normally be significant if the project would:

Adversely change the significance of an historical or unique archeological resource, including the demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the resource would be materially impaired (Section 15064.5 (b)(1), CEQA Guidelines);

Directly or indirectly destroy a unique paleontological resource or site or unique geological feature; or

Disturb any human remains, including those interred outside of formal cemeteries.

DISCUSSION OF IMPACTS

a) Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5?

Section 15064.5 of CEQA identifies substantial adverse change in the significance of a historical resource as: "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired." This project pertains to herbicide applications to the canals and waterways operated by NID and will not affect any state listed historic sites registered with the Office of Historic Preservation. Additionally, no potential uncovering of historic resources is expected to occur since no soil disturbance activities apply to this project. As a result no impact to historical resources will occur.

b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to Section 15064.5?

The NID Aquatic Weed Management Program is not expected to adversely change the significance of an archeological resource since it is concerned with aquatic vegetative management. No impact.

c) **Directly or indirectly destroy a unique paleontological resource or site or unique geological feature?**

No development or construction is associated with this project so it is not anticipated that any unique paleontological resources or unique geologic features will be directly or indirectly destroyed. As a result no impacts to such sites are expected to occur.

d) **Disturb any human remains, including those interred outside of formal cemeteries?**

The project is not anticipated to disturb any human remains, including those interred outside of formal cemeteries. No impact.

CONCLUSION

This project does not entail soils movement or construction. No potentially significant impacts to cultural resources are anticipated from this project.

3.6 Geology and Soils

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death, involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?	☐	☐	☐	☒
ii) Strong seismic ground shaking?	☐	☐	☐	☒
iii) Seismic-related ground failure, including liquefaction?	☐	☐	☐	☒
iv) Landslides?	☐	☐	☐	☒
b) Result in substantial soil erosion or the loss of topsoil?	☐	☐	☐	☒
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	☐	☐	☐	☒
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	☐	☐	☐	☒
e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

Due to the presence of active and potential active faults in the state, all areas within the state are susceptible to some degree of seismic ground shaking and associated seismic hazards including liquefaction. Fault features can be classified as active, potentially active, or inactive. Active faults are those faults where movement has taken place over the last 11,000 years (the Holocene Epoch). Potentially active faults are those considered to have been active within approximately the last 1.6 million years (the Quaternary period). Faults with no known movement within the last 1.6 million years are considered inactive. There are no identified active faults within Nevada, Placer, or Yuba counties.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts to geology and soils would normally be significant if the project would:

Expose people or structures to risk of loss, injury, or death from earthquake, seismic ground shaking, seismic related ground failure or landslides;

Result in substantial soil erosion or loss of topsoil;

Be located on unstable or expansive soil; or

Have soils incapable of supporting proposed septic systems or other wastewater systems.

DISCUSSION OF IMPACTS

a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury or death, involving:

i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault?

ii) Strong seismic ground shaking?

iii) Seismic-related ground failure, including liquefaction?

iv) Landslides?

The project is not located in an Alquist-Priolo Earthquake Fault Zone. The proposed project affects aquatic vegetation and is not anticipated to result in the exposure of people or structures to adverse affects associated with a known earthquake fault, seismic ground shaking, seismic ground failure, liquefaction or landslides. Therefore, the project would have no impact from earthquakes, seismic ground shaking, seismic related ground failure, or landslides.

b) Result in substantial soil erosion or the loss of topsoil?

No grading or construction activities are associated with this project, and as such no soil erosion activities are expected to occur as a result of herbicide applications. No impact.

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

The result of herbicide applications into the canals and waterways managed by NID will not lead to the instability of the projects' structures. In addition the applications will not contribute to on or off site landslides, lateral spreading, subsidence, liquefaction, or collapse.

d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

The proposed project involves the application of aquatic herbicides to the water conveyance structures and waterways maintained by NID. As a result no substantial risks to life or property are expected to occur due to these applications. The soils associated with this project are the sediments located in the canals and waterways. There would be no impact to life or property from this project due to expansive soil.

e) Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?

No septic tanks or alternative wastewater disposal systems are planned for this project, so there would be no impact.

CONCLUSION

The area of the project site is considered a low seismic risk. Any seismic event occurrence will produce ground shaking but should not result in liquefaction or landslides. Both the underlying geology and the soils of the project site are relatively stable. No potentially significant impacts resulting from the geology and soils of the site will result from the proposed project.

3.7 Hazards and Hazardous Materials

	Potentially Significant impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?	☐	☐	☒	☐
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	☐	☐	☒	☐
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school?	☐	☐	☒	☐
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?	☐	☐	☐	☒
e) For a project located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	☐	☐	☐	☒
g) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?	☐	☐	☐	☒
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

For the purpose of evaluating hazards and hazardous materials, this section of the Initial Study addresses the application of aquatic herbicides into the canals and waterways operated by NID.
The Aquatic Weed Management Program is conducted by NID to deter the growth of algae and aquatic plants in the canals and ensure adequate flows. The herbicides used in the management program are obtained in concentrated form and if mishandled could result in bodily injury or harm. The storage, usage, and disposal of the herbicides comply with the guidelines concerning hazardous materials. The BMP's discussed in section 2.7 of this document explain the safety measures and precautions taken by NID when handling, preparing, and applying the herbicides for application.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts relating to hazards and hazardous materials would normally be significant if the project would:

Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials;

Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school;

Be located on a site which is included on a list of hazardous materials sites;

If within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, or within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area;

Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan; or

Expose people or structures to a significant risk of loss, injury or death involving wildland fires.

DISCUSSION OF IMPACTS

a) Create a significant hazard to the public or the environment through the routine transport, use or disposal of hazardous materials?

The routine transport and usage of hazardous materials could potentially create a hazard to the public and the environment. NID routinely uses the aquatic herbicides Magnacide H, Aquamaster, Clearigate, Copper Sulfate PD, Cutrine Plus, and Rodeo to control the growth of aquatic weeds and vegetation. These chemicals when used correctly (FIFRA label requirements) are not expected to adversely affect water quality or the surrounding environment. In the event of a spill or accidental leakage of these chemicals, spill abatement measures will be implemented. Because of the relatively small quantities of materials transported and used, these potential impacts are considered less than significant.

b) **Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?**

This project requires the use of potentially hazardous materials (i.e. acrolein, Clearigate, copper sulfate PD, Cutrine-Plus, Rodeo, and Aquamaster). There are reasonably foreseeable accidents involving the release of hazardous materials into the environment due to accidental leakage, or spills. However, the storage, handling, and use of hazardous materials related to aquatic herbicide application are conducted in accordance with applicable federal, state, and local laws. This minimizes the potential of an accidental spill of hazardous materials during applications, transport, and storage. The impact of such an event would be less than significant because of the small quantities of materials used.

c) **Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances or waste within one-quarter mile of an existing or proposed school?**

While the project site may be located within one-quarter mile (1320 feet) of a school, most of NID's herbicide application sites are located in rural areas, and areas outside of school zones. Moreover, the application of herbicides for this project is site specific and not widespread. Along with other BMP's implemented as part of NID's Aquatic Weed Management Program concerning herbicide transportation, handling, and application, it is anticipated that the level of impact of hazardous materials within one-quarter mile of existing schools will be less than significant.

d) **Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code § 65962.5 and, as a result, would it create a significant hazard to the public or the environment?**

The project site is not located on the United States EPA list of Superfund hazardous waste sites, nor is it on the State of California Department of Toxic Substances Control Hazardous Waste and Substances Site list (the Cortese List). No impact.

e) **For a project located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project result in a safety hazard for people residing or working in the project area?**

Although the project site is located within two miles of the Grass Valley and Auburn public airports, it will not result in a safety hazard. No impact.

f) **For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?**

The project site may be located within the vicinity of private airstrips, however it will not result in a safety hazard. No impact.

g) Impair implementation of, or physically interfere with, an adopted emergency response plan or emergency evacuation plan?

The NID Aquatic Weed Management Program would not impair implementation or physically interfere with an adopted emergency response plan or emergency evacuation plan. No impact would occur.

h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

None of the proposed activities by NID are expected to expose people or structures to a significant risk of loss, injury, or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands. No impact.

CONCLUSION

Because of the BMPs used to handle and use herbicides, there are no potentially significant impacts related to hazards and hazardous materials.

3.8 Hydrology and Water Quality

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Violate any water quality standards or waste discharge requirements?	☐	☒	☐	☐
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?	☐	☐	☐	☒
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?	☐	☐	☐	☒
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?	☐	☐	☐	☒
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?	☐	☐	☐	☒
f) Otherwise substantially degrade water quality?	☐	☒	☐	☐
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?	☐	☐	☐	☒
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?	☐	☐	☐	☒

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of a failure of a levee or dam?	☐	☐	☐	☒
j) Inundation by seiche, tsunami or mudflow?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

NID has been conducting aquatic weed management since the 1960's. Currently, aquatic herbicides are applied to specific canals and waterways operated by NID to control, eliminate, and reduce aquatic vegetation which can impede flows to their customers. All herbicides are applied in compliance with FIFRA label requirements and take flows into consideration. NID has a monitoring program for herbicide applications that has been in place since the spring of 2003. NID is currently covered by Water Quality Order No. 2001-12-DWQ, Statewide General National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Aquatic Pesticides to Waters of the United States (General Permit No. CAG990003).

Requirements of the General NPDES Permit for Aquatic Herbicide Applications

The basic requirements of this General Permit include:

1. The General Permit requires that the dischargers must comply with all pesticide label instructions, DPR and DHS regulations, and any Use Permits issued by the County Agricultural Commissioner.

2. The discharger must identify and implement best management practices (BMPs) that are designed to maximize efficacy of control efforts and minimize adverse impacts to the environment.

3. The General Permit requires that the dischargers comply with the Monitoring and Reporting Program (MRP) that is incorporated as Attachment B of the General Permit. Dischargers are also required to submit technical and monitoring reports as directed by the appropriate RWQCB's Executive Officer.

Clean Water Act Section 301 and 402

The 1972 amendments to the Federal Water Pollution Control Act established the National Pollutant Discharge Elimination System (NPDES) permit program to control discharges of pollutants from point sources (Section 402). NPDES permits for discharges to surface waters must meet all applicable provisions of Sections 301 and 402 of the CWA. These provisions require controls of pollutant discharges that utilize best available technology economically achievable (BAT) and best conventional pollutant control technology (BCT) to reduce pollutants and any more stringent controls necessary to meet water quality standards.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts to hydrology and water quality would normally be significant if the project would:

Violate any water quality standards or waste discharge requirements;

Substantially deplete groundwater supplies or interfere substantially with groundwater recharge;

Substantially alter the existing drainage pattern of the site or area, including changes that result in substantial erosion or siltation on- or off-site;

Substantially alter the existing drainage pattern of the site or area, including changes that substantially increase the rate of surface runoff that causes flooding on- or off-site, creating or contributing to a local or regional flooding problem;

Create or contribute to runoff water that would exceed the capacity of existing or planned stormwater drainage systems; or

Expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam.

DISCUSSION OF IMPACTS

a) Violate any water quality standards or waste discharge requirements?

NID's goal is to adhere to the water quality standards and discharge requirements of the CWA as they pertain to herbicide applications into the waters of the United States. Proposed activities of this project have the potential to violate these requirements if the recommended label requirements are not strictly adhered to. This is considered a potentially significant impact.

The following mitigation measures shall be implemented to reduce potential impacts associated with the violation of water quality standards or waste discharge requirements:

Mitigation Measure # 5

Herbicides will only be applied by licensed applicators in a manner consistent with the label requirements.

Mitigation Measure # 6

Discharges of waters treated with herbicides to natural stream systems will be avoided where possible and otherwise minimized. Canals treated with acrolein will be held for a minimum of 6 day prior to being released into natural water bodies. Acrolein treated water may be released sooner if released directly for agricultural irrigation and will not intercept natural waterways.

Mitigation Measure # 7

Ambient levels of alkalinity will be monitored and the application rates (and resultant concentrations of herbicides that contain copper) will be decreased to minimize potential toxic impacts. When the receiving natural waterbody flows are low, calcium carbonate ($CaCO_3$) will be added to the water prior to discharge. This will raise the

existing alkalinity in the treated water and reduce the toxicity of the copper in the receiving waters to a less than significant level.

b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

This project requires the application of herbicides into canals and waterways maintained by NID. NID will not be required to access or recharge any groundwater supplies as a result of their Aquatic Weed Management Program. As a result, their activities will not affect the groundwater table level or nearby wells. NID relies on rainfall and snowmelt activities in the recharging of reservoirs, creeks, and canals. These activities will not deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume. No impact.

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner which would result in substantial erosion or siltation on- or off-site?

It is the intent of NID to convey water from reservoirs, canals, and creeks to their irrigation customers. No alteration of drainage ways, including the alteration of streams and rivers is anticipated under the Aquatic Weed Management Program. Therefore, no impacts to drainage patterns will occur.

d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?

As discussed in section c) above, no alteration of drainage ways, including the alteration of streams and rivers is anticipated under the Aquatic Weed Management Program. In addition, the elimination and/or reduction of aquatic vegetation in NID canals and waterways significantly decrease the potential for flooding due to the creation of unimpeded flows. No impacts will occur.

e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

This project involves the application of herbicides into established water conveyance systems operated by NID. NID water is conveyed through canals, pipes, and waterways and is not discharged into stormwater drainage systems. The activities of the Aquatic Weed Management Program are not anticipated to contribute any substantial additional sources of polluted runoff. No impacts will occur.

f) **Otherwise substantially degrade water quality?**

Due to the application of aquatic herbicides directly into canals and waterways managed by NID, a potential to degrade water quality exists. Magnacide H, Cutrine Plus, Copper Sulfate PD, Rodeo, and Aquamaster are the herbicides that are used to manage aquatic vegetation. Copper may exacerbate the toxicity of herbicides present in downstream waterways, and Sulfate loading may exacerbate the methylization of mercury contaminated sediments in downstream waterways. Implementation of the mitigation measures described in this document will reduce this potentially significant impact to a less than significant level.

Mitigation Measure # 8

The minimum effective amounts of herbicides will be applied to minimize potential water quality impacts.

Mitigation Measure # 9

Discharges of waters treated with sulfate compounds to natural waterways will be avoided. This will prevent the loading of sulfate to waterways with sediments contaminated with mercury.

Mitigation Measure # 10

Discharges of waters treated with herbicides to water treatment plants will be avoided.

g) **Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?**

This project will not result in the placement of housing within a 100-year flood hazard area. There is no impact.

h) **Place within a 100-year flood hazard area structures that would impede or redirect flood flows?**

This project will not result in the redirection of flood flows. No impact is expected to occur as a result of this project.

i) **Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of a failure of a levee or dam?**

This project requires the application of herbicides into canals that are operated by NID. These applications do not contribute to flooding, or contribute to the failure of a levee or dam. The herbicide applications will not expose people or structures to significant risk of loss, injury or death involving flooding, or flooding as a result of dam or levee failure. No impact.

j) Inundation by seiche, tsunami or mudflow?

The project site is not located in an area subject to seiche, tsunami, or mudflow. No impact.

CONCLUSION

The Aquatic Weed Management Program serves to ensure a reliable source of drinking water and irrigation. The application of aquatic herbicides into the canals and waterways has the potential to result in a significant impact to water quality if not applied in accordance with the DPR, DHS, CWA and EPA regulations. This impact is mitigated to less than significant by implementing the mitigation measures proposed within this document.

3.9 Land Use Planning

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Physically divide an established community?	☐	☐	☐	☒
b) Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	☐	☐	☐	☒
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

This project will be implemented throughout a wide range of land uses and zoning designations. However, the project does not require any construction of structures or alterations to existing land uses.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts to land use and planning would normally be significant if the project would:

Physically divide an established community;

Conflict with any applicable land use plan or policy, including the El Dorado County General Plan alternatives and the El Dorado Zoning ordinance; or conflict with any regulation adopted to avoid or mitigate an environmental effect of an agency with jurisdiction over the project; or

Conflict with any applicable habitat conservation plan or natural community conservation plan.

DISCUSSION OF IMPACTS

a) Physically divide an established community?

This project will not result in the physical division of any established community and therefore there is no impact to established communities.

b) Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

The NID will comply with all required permits and adhere to all required County and District requirements and standards. Therefore, there is no impact.

c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

The project site is not located within a designated Habitat Conservation Plan (HCP) area or within a designated Natural Community Conservation Plan (NCCP) area. There are no conflicts with any conservation plans and therefore no impact.

CONCLUSION

The project is consistent will all existing County land use and zoning policies and regulations. The project will not physically divide an existing community and is not located in any designated Habitat Conservation Plan or Natural Community Conservation Plan. There are no impacts to land use and planning and therefore no mitigation is necessary.

3.10 Mineral Resources

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?	☐	☐	☐	☒
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

A range of mineral resources occurs throughout the project area. However, the project does not entail any earthmoving or construction activities.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts to mineral resources would normally be significant if the project would:

Result in the loss of availability of a known mineral resource with value to the region and residents of the state; and

Result in the loss of availability of a locally important mineral resource recovery site delineated on County General Plans or on a specific plan in the immediate vicinity of the project.

DISCUSSION OF IMPACTS

a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?

This project will not result in the loss of availability of known mineral resources that would be of value to the region and residents of the state. There is no impact.

b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

This project will not result in the loss of availability of locally important mineral resource recovery sites delineated on a local general plan, specific plan or other land use plan. There is no impact.

CONCLUSION

As there are no earthmoving or construction activities anticipated, there are no expected impacts to mineral resources.

3.11 Noise

Would the project result in:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies?	☐	☐	☐	☒
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	☐	☐	☐	☒
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	☐	☐	☐	☒
e) For a project located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The NID herbicide application sites are located in rural, open space, or agricultural areas. No aspects of this project are proposed to increase or create any significant level of noise. The most significant source of noise generated in the project area is associated with vehicular traffic on roadways that are adjacent to canals and waterways. Because the majority of land within the district is rural or undeveloped, noise levels in the project area are expected to be relatively low and insignificant.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts from noise levels would normally be significant if the project would:

Expose people to noise levels in excess of standards established in the local general plan and noise ordinance;

Expose people to excessive groundborne vibration or groundborne noise levels;

Create a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;

If located within an airport land use plan or within two miles of a public airport, expose people in the project area to excessive noise levels;

If located within the vicinity of a private airstrip, expose people in the project area to excessive noise levels.

DISCUSSION OF IMPACTS

a) **Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance or of applicable standards of other agencies?**

Placer, Nevada, and Yuba counties have not adopted any noise standards through an ordinance or plan that would be applicable to the proposed project. As such, the project will not result in the exposure of persons to or generation or noise levels in excess of standards established by the County General Plans, noise disturbance or other applicable planning documents. Therefore, there is no impact.

b) **Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?**

None of the proposed activities of this project will generate or expose persons to ground-borne vibrations or ground-borne noise levels. Therefore, there is no impact.

c) **A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?**

The project will not result in a substantial permanent increase in ambient noise levels above existing noise levels and therefore is no impact.

d) **A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?**

No increase in ambient noise levels in the project vicinity is anticipated and as a result no impact will occur.

e) **For a project located within an airport land use plan area or, where such a plan has not been adopted, within two miles of a public airport or a public use airport, would the project expose people residing or working in the project area to excessive noise levels?**

Portions of the project are located within two miles of a public airport. Since the minimal increase in noise levels will occur as a result of project activities, no

impact is expected within the airport land use zone, and is not expected to expose people working in the project area t excessive noise levels.

f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

The project will not generate excessive noise. No impact.

CONCLUSION

The operations of the Aquatic Weed Management Program will have no substantial impact to noise levels due to the operation of equipment associated with herbicide applications.

3.12 Population and Housing

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?	☐	☐	☐	☒
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

This project will neither create nor destroy housing units, and will not affect housing in the project area. No one will be displaced as a result of this project.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts to population and housing would be significant if the project would:

Induce substantial economic or population growth in an area not considered in the General Plan, Specific Plan or other regional planning document;

Displace substantial numbers of existing housing; or

Displace substantial numbers of people.

DISCUSSION OF IMPACTS

a) Induce substantial population growth in an area, either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., through extension of roads or other infrastructure)?

The proposed activities of this project are not expected to directly or indirectly induce population growth. No impact.

b) **Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?**

The proposed activities of this project are not expected to displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere. No impact.

c) **Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?**

The proposed activities of this project are not expected to displace substantial numbers of people, necessitating the construction of replacement housing elsewhere. No impact.

Consistency with Land Use Planning

This project does not require construction or changes in land use. Therefore, it is consistent with existing zoning and land use plans.

CONCLUSION

The aquatic Weed Management Program does not have the potential for significant impacts to housing or land use.

3.13 Public Services

		Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:					
a)	Fire protection?	☐	☐	☐	☒
b)	Police protection?	☐	☐	☐	☒
c)	Schools?	☐	☐	☐	☒
d)	Parks?	☐	☐	☐	☒
e)	Other public facilities?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

The Aquatic Weed Management Program is intended for existing canals and waterways within the District's existing service area. The effect of the treated water is not expected to result in any additional demand for governmental fire, police, school, park, or other services. Therefore the project is not expected to result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities for these services.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts from the provision of public services would normally be significant if the project would:

> Create a need for new or altered governmental services or facilities, including fire, police, schools, and parks; the construction of which could cause substantial and significant adverse environmental impacts.

DISCUSSION OF IMPACTS

> **Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the following public services:**
>
> a) No additional fire protection facilities are required. No impact.

b) No additional police protection facilities are required. No impact.

c) No additional school facilities are required. No impact.

d) No additional park facilities are required. No impact.

e) No additional other public facilities are required. No impact.

CONCLUSION

As the project would not create a need for additional public services, there is no impact.

3.14 Recreation

	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	☐	☐	☐	☒
b) Include recreational facilities, or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?	☐	☐	☐	☒

ENVIRIONMENTAL SETTING

There are no components of the project that would require the construction or expansion of new parks or recreational facilities, nor cause or accelerate substantial physical deterioration of existing facilities.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts from recreation would normally be significant if the project would:

Cause or accelerate substantial physical deterioration of existing area parks or recreational facilities.

Have an adverse effect on the environment by creating a need for construction or expansion of recreational facilities.

DISCUSSION OF IMPACTS

a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

The project will not increase the use of existing parks. No impact.

b) Include recreational facilities, or require the construction or expansion of recreational facilities, which might have an adverse physical effect on the environment?

The project does not include the development of additional recreational facilities. No impact.

CONCLUSION

The project does not create any changes to recreational or park facilities, either existing or planned. There are no impacts.

3.15 Transportation/Traffic

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?	☐	☐	☐	☒
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	☐	☐	☐	☒
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?	☐	☐	☐	☒
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	☐	☐	☐	☒
e) Result in inadequate emergency access?	☐	☐	☐	☒
f) Result in inadequate parking capacity?	☐	☐	☐	☒
g) Conflict with adopted policies, plans or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

This project requires the application of aquatic herbicides into the canals and waterways operated by NID. Transportation to and from the application sites by NID employees are not expected to contribute to a substantial increase in traffic. Most of the application sites are located off of main traffic routes and will not affect traffic patterns within their service area. No new structures are part of this project and it is not expected to generate additional traffic to the site. As a result there will be no impacts to increases in traffic, congestion, air traffic patterns, hazards from design features, emergency access or parking capacity.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts relating to transportation and traffic would normally be significant if the project would:

Substantially increase traffic relative to existing load and capacity;

Exceed an established level-of-service standard;

Result in a change in air traffic patterns;

Substantially increase hazards due to design or incompatible uses

Result in inadequate emergency access;

Result in inadequate parking capacity; or

Conflict with adopted alternative transportation policies, plans, or programs.

DISCUSSION OF IMPACTS

a) **Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume-to-capacity ratio on roads, or congestion at intersections)?**

See discussion in Environmental Setting above. No impact.

b) **Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?**

See discussion in Environmental Setting above. No impact.

c) **Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?**

See discussion in Environmental Setting above. No impact.

d) **Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?**

See discussion in Environmental Setting above. No impact.

e) **Result in inadequate emergency access?**

See discussion in Environmental Setting above. No impact.

f) **Result in inadequate parking capacity?**

See discussion in Environmental Setting above. No impact.

g) **Conflict with adopted policies, plans or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?**

See discussion in Environmental Setting above. No impact.

CONCLUSION

The Aquatic Weed Management Program will not create substantial traffic increases nor adversely impact county levels of service. There are no conflicts with alternative transportation plans and no significant impacts to parking, air traffic patterns, or emergency access.

3.16 Utilities and Service Systems

Would the project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	☐	☐	☐	☒
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	☐	☐	☐	☒
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	☐	☐	☐	☒
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?	☐	☐	☐	☒
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	☐	☐	☐	☒
g) Comply with federal, state and local statutes and regulations related to solid waste?	☐	☐	☐	☒

ENVIRONMENTAL SETTING

This project pertains to the application of aquatic herbicides used by NID into their canals and waterways, which are considered to be waters of the United States. These applications do not pertain to wastewater treatment requirements of the RWQCB, nor are these activities served by a landfill. No additional wastewater or water supply infrastructure is currently planned within the project area. The expansion of other water supply facilities or wastewater facilities is also not anticipated with this project, nor is it expected to cause significant environmental effects to utilities or service systems.

CRITERIA FOR DETERMINING SIGNIFICANCE

Impacts relating to utilities and service systems would normally be significant if the project would:

Exceeds wastewater treatment requirements of the applicable Regional Water Quality Control Board;

Does not have sufficient water supplies from existing entitlements to serve the project;

Results in a determination by a local wastewater treatment provider, that there is not adequate capacity to serve the project;

Is not served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.

DISCUSSION OF IMPACTS

a) **Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?**

No wastewater facilities are associated with this project. As such this project will not exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board. No impact.

b) **Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

This project will not require or result in the construction of new water or wastewater treatment facilities or necessitate expansion or existing facilities. No impact would occur.

c) **Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?**

No construction or expansion of stormwater drainage facilities will be required, or is expected to occur with this project. As a result no significant environmental effects from the construction of stormwater drainage facilities will occur, and there will be no impact.

d) **Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?**

No new or expanded entitlements are expected with this project and no impact is expected.

e) **Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand, in addition to the provider's existing commitments?**

This project will not be served by wastewater treatment facilities and no impact would occur.

f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

This project will not be served by a landfill. Therefore, there is no impact.

g) Comply with federal, state and local statutes and regulations related to solid waste?

This project will comply with all federal, state, and local statues and regulations related to solid waste. No impact.

CONCLUSION

This project will not have an impact on water supply, wastewater, solid waste, or other utilities and service systems.

3.17 Mandatory Findings of Significance

Does the Project:	Potentially Significant Impact	Potentially Significant Unless Mitigation Incorporated	Less Than Significant Impact	No Impact
a) Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of rare or endangered plants or animals, or eliminate important examples of the major periods of California history or prehistory?	☐	☒	☐	☐
b) Have impacts that are individually limited, but cumulatively considerable? "Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.	☐	☐	☒	☐
c) Have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?	☐	☐	☐	☒

DISCUSSION OF IMPACTS

a) **Have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of rare or endangered plants or animals, or eliminate important examples of the major periods of California history or prehistory?**

The project does have the potential to significantly impact the environment by potentially impacting listed species of fish and wildlife or potentially impacting water quality. However the implementation of mitigation measures in sections 3.4 (Biological Resources) and 3.8 (Hydrology and Water Quality) will reduce the impacts in these areas to less than significant.

b) **Have impacts that are individually limited, but cumulatively considerable? "Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.**

The loading of herbicides to waterways as a result of this project will add to the herbicide loadings that result from other activities, including agriculture, forest

practices, roadside maintenance, and domestic use. However, these additional loadings are incremental and not cumulatively considerable, and are not anticipated to have significant impacts.

c) Have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

The implementation of BMPs and compliance with all regulations pertaining to the handling and use of herbicides allows for the application of these products without substantial adverse effects on human beings.

4.0 DETERMINATION

On the basis of this initial evaluation:

☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.

☒ I find that although the proposed project could have a significant effect on the environment, there will not be a significant effect in this case because the mitigation measures described on the attached sheets have been added to the project (see Appendix H). A NEGATIVE DECLARATION will be prepared.

☐ I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.

☐ I find that the proposed project MAY have a significant effect on the environment, but at least one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based upon the earlier analysis as described on attached sheets, if the effect is a "potentially significant impact" or "potentially significant unless mitigated." An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that, although the proposed project could have a significant effect on the environment, there will NOT be a significant effect in this case because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project. Nothing further is required.

Robin K. Lantz
Signature

12-10-03
Date

Robin Lantz, Maintenance Manager
Printed Name

NEVADA IRRIGATION DISTRICT
For

5.0 REPORT PREPARATION AND REFERENCES

5.1 Report Preparation Update

NEVADA IRRIGATION DISTRICT – LEAD AGENCY

Robin Lantz, Maintenance Manager
Bruce Early, Pest Control Superintendent
Sue Sindt, Operations Supervisor

FOOTHILL ASSOCIATES

John Heal, Project Manager
David Kelley, Regulatory Specialist
Brian Mayerle, Biologist
Linda Rivard, Biologist/ Resource Specialist
Robin Mahoney, Water Resource Engineer

5.2 Persons and Agencies Consulted

REGIONAL WATER QUALITY CONTROL BOARD

Jason Churchill, Ph.D., Environmental Scientist III, and other Regional Board staff.

SOLANO IRRIGATION DISTRICT

Mike Messina, Maintenance Manager

5.3 Glossary

AWMP — **Aquatic Weed Management Program** – program designed to remove, control, or eradicate aquatic weeds by physical, chemical, or biological methods

BMPs — **Best Management Practices** - management practices developed pursuant to federal water quality legislation, to prevent or reduce non-point source pollution of surface and ground waters while still allowing the productive use of resources. These common-sense actions are required by law, and are designed to protect water quality by keeping soil and other pollutants out of streams and lakes.

CARB — **California Air Resources Board** – Established up by the California Legislature in 1967 to protect California's air quality. CARB sets and enforces emissions standards and health-based air quality standards, conducts research, monitors air quality, identifies and sets control measures for toxic air contaminants, provides assistance to businesses, educates and conducts outreach

programs, and oversees and assists local air quality districts which regulate most non-vehicular sources of air pollution.

CEQA — **California Environmental Quality Act** - statute that requires state and local agencies to identify the significant environmental impacts of their actions and to avoid or mitigate those impacts, if feasible.

CWA — **Clean Water Act –** act that originated in the Federal Water Pollution Control Act Amendments of 1972, generally prohibits the discharge of pollutants into "navigable waters" or "waters of the United States". The objective of the CWA is to "restore and maintain the chemical, physical and biological integrity of the Nation's waters" so that they can "support the protection and propagation of fish, shellfish, and wildlife and recreation in and on the water."

The CWA requires a **National Pollutant Discharge Elimination System (NPDES)** permit before any pollutant can be discharged into navigable waters from a point source.

FIFRA — **Federal Insecticide, Fungicide, and Rodenticide Act –** a comprehensive federal statute which regulates pesticide use, sales, registration and labeling, and grants enforcement authority to the Environmental Protection Agency (EPA). All pesticides used in the U.S. must be registered (licensed) by EPA. Registration assures that pesticides will be properly labeled and that if in accordance with specifications, will not cause unreasonable harm to the environment. FIFRA's objective is to protect human health and the environment from harm from pesticides.

GC/MS — **Gas Chromatograph/Mass Spectrometer** - instrument used routinely in the determination of organics in environmental samples. The system consists of a gas chromatograph (GC) directly attached to a mass selective detector (MS). Gas chromatography vaporizes a sample and transports it through a column of inert gas. Sample components are separated based on their relative affinity for the column stationary phase. The components are then detected and represented as peaks by the detector. The detector sends a minivolt signal to the integrator which plots and integrates the chromatograph. Following separation by GC, the mass spectrometer separates and identifies ionized atoms or molecules based on their mass to charge ratio (m/z). Structural information about a compound is gained from the resulting fragmentation pattern.

IS — **Initial Study –** requirement of the California Environmental Quality Act (CEQA) Guidelines. It is a preliminary analysis prepared by the lead agency to determine whether a Negative Declaration (ND) or Environmental Impact Report (EIR) must be prepared or to

identify the significant environmental effects to be analyzed in an EIR.

Lead Agency — The **Lead Agency** is the public agency which has the principal responsibility for carrying out or approving the project which may have a significant effect upon the environment. The Lead Agency will decide whether an EIR or Negative Declaration will be required for the project and will cause the document to be prepared.

MND — **Mitigated Negative Declaration** – negative declaration prepared for a project when the CEQA initial study has identified potential significant effects on the environment, but (1) revisions in the project plans or proposals made by, or agreed to by, the applicant before the proposed negative declaration and initial study are released for public review would avoid the effects or mitigate the effects to a point where clearly no significant effect on the environment would occur, and (2) there is no substantial evidence in light of the whole record before the public agency that the project, as revised, may have a significant effect on the environment.

ND — **Negative Declaration** – written statement briefly describing the reasons that a proposed project will not have a significant effect on the environment and does not require the preparation of an EIR.

NID — **Nevada Irrigation District** – public water agency that provides water to customers in Nevada, Placer, and Yuba counties for urban and agricultural uses.

NPDES — **National Pollution Discharge Elimination System** - authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. The Clean Water Act prohibits anybody from discharging "pollutants" through a "point source" into a "water of the United States" unless they have an NPDES permit. The permit contains limits on what you can discharge, monitoring and reporting requirements, and other provisions to ensure that the discharge does not hurt water quality or people's health. The permit translates general requirements of the Clean Water Act into specific provisions tailored to the operations of each person discharging pollutants.

SWRCB — **State Water Resources Control Board** - The State Board's mission is to preserve, enhance and restore the quality of California's water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations.

USEPA — **United States Environmental Protection Agency** –The USEPA's mission is "to protect human health and to safeguard the natural environment — air, water, and land". EPA works to develop and

enforce regulations that implement environmental laws enacted by Congress. EPA is responsible for researching and setting national standards for a variety of environmental programs, and delegates to states and tribes the responsibility for issuing permits and for monitoring and enforcing compliance. Where national standards are not met, EPA can issue sanctions and take other steps to assist the states and tribes in reaching the desired levels of environmental quality.

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NEVADA IRRIGATION DISTRICT
MITIGATION MONITORING PLAN
for the
AQUATIC WEED MANAGEMENT PROGRAM

Aquatic Weed Management Monitoring Program Overview

A monitoring program can be a key element in determining the success of an aquatic weed management program along with ensuring minimal impacts to the environment and public health and safety. Monitoring also provides an effective means of determining if mitigation measures are effective and that potential impacts are below the level of significance, as required by CEQA. Visual inspections along with the collection of water quality parameters and samples for analysis are some of the components of a monitoring program.

Nevada Irrigation District will be responsible for mitigation monitoring and reporting as required by CEQA. NID will also be responsible for the monitoring and reporting that is required by the Statewide General NPDES Permit that will be issued in January 2004, Discharges of Aquatic Pesticides to Surface Waters of the United States. Details of the parameters monitored for CEQA compliance are located in Appendix H – Mitigation Measures; details of the draft NPDES monitoring and reporting program are found within this appendix below.

Parameters to be measured for CEQA compliance

Two types of parameters will be measured as part of the Aquatic Weed Management Program. One set of water quality and biological parameters will be monitored to characterize the background conditions in the affected environment and the second set of herbicide concentration parameters will be monitored to assess the potential for significant impacts and the effectiveness of the mitigative measures.

The water quality and biological parameters that measure and characterize background conditions are alkalinity, temperature, pH, presence/absence of flora and fauna, flows in canals and receiving bodies, and assessments of canal integrity. Much of these data already exist and will be utilized to plan the most cost-effective means of characterizing the affected environment.

Data on alkalinity indicate that it is generally low and ranges from 25 – 35 mg/l. Low ambient levels of alkalinity are indicative that copper toxicity is exacerbated and that the water quality criteria are more stringent. The criterion for the maximum concentration (4 day average, total recoverable) of copper at these levels of alkalinity is approximately 3 ppb (CA Toxics Rule and USEPA National Recommended Water Quality Criteria to Protect Freshwater Aquatic Life) beyond the mixing zone.

Presence and absence survey data for sensitive biological resources will be collected in those areas where they may reasonably be expected to occur and where mitigative measures could be implemented to reduce the potential for exposure to elevated herbicide levels. In these areas, the immediate vicinity of canals will be surveyed for the presence of sensitive biological species. Surveys will assess for the presence of elderberry shrubs, listed salmonids, California Red-legged Frogs, foothill yellow-legged frogs, and northwestern pond turtles.

Flows in canals and in receiving bodies (creeks) will be monitored to determine concentrations of herbicides in those waters. Assessments of canals integrity will be conducted on an annual basis during routine maintenance tasks. This includes observation of leaks, unsecured gates and other control structures, and other locations of uncontrolled discharge from canals that may be treated with herbicides.

The parameters to be measured to assess potential impacts are the concentrations of herbicides in treated waters (canals), including acrolein, glyphosate, and copper. These relatively high concentrations of herbicides can be more effectively characterized than the very low concentrations found in downstream locations.

Requirements of the NPDES Monitoring Program

The Statewide General Permit requires aquatic herbicide dischargers to comply with the Monitoring and Reporting Program (MRP). This requires dischargers to submit technical and monitoring reports to the Regional Water Quality Control Board (RWQCB) Executive Officer, and to develop and implement an appropriate Monitoring Plan.

The goals of the Plan are as follows:

1. Document compliance with the requirements of the General Permit;
2. Support the development, implementation and effectiveness evaluation of Best Management Practices (BMP's);
3. Demonstrate the full restoration of water quality and protection of beneficial uses of the receiving waters following completion of resource or pest management projects;
4. Identify and characterize aquatic pesticide application projects conducted by the discharger; and
5. Assure that the Plan proves for monitoring of projects that are representative of all pesticides and application methods used by the discharger.

NID has implemented a monitoring program to comply with current National Pollution Discharge Elimination System (NPDES) General Permit requirements. The monitoring program provides documented compliance and supports the development, implementation and effectiveness of BMP's used by NID in their Aquatic Weed Management Program. Monitoring also provides information that demonstrates the full restoration of water quality and protection of beneficial uses of the receiving waters following completion of pest control applications. The plan identifies and characterizes aquatic pesticide applications conducted by NID, and assures that the monitoring projects are representative of all pesticide and application methods used by NID. U.S. EPA Guidance on Quality Assurance Project Plans Final (U.S. EPA QA/g-5, February 1998) was used to develop the specifications and procedures of the monitoring plan. The results of the monitoring will be analyzed and the mitigative measures of the Aquatic Weed Management Program will be modified as needed to ensure that potential impacts remain below the level of significance. Details of the Aquatic Herbicide Monitoring and Reporting Plan implemented by NID can be located in Appendix B; the details of the Quality Assurance Protection Plan (QAPP) located in Appendix C; the 2002 annual report is found in Appendix G.

NID Monitoring Methods

NID has been actively monitoring their applications of aquatic herbicides since the beginning of the application season in March 2002. Sample locations are selected

based on safety of access, permission to access from property owners, and summer flow rates that would allow for sufficient sampling. Samples will be collected both upstream and downstream of the application site where canal waters are connected to the receiving waters, and the flow data for the canal and receiving waterbody will be recorded. The concentration of the herbicide in the canals is determined along with the concentration of the herbicide in the receiving body upstream of the discharge location. Other parameters that are measured along with each sample are alkalinity, temperature, and pH.

Samples will be collected at representative sites after each herbicide application (generally every 3-4 weeks). A state certified laboratory will analyze each sample for concentrations of the active ingredient of the herbicide used. All samples with detected concentrations of the active ingredient will be confirmed by gas chromatograph/mass spectrometer (GC/MC). All personnel receive training on field and laboratory procedures prior to conducting sampling to ensure that the work is conducted accurately and safely. In addition, an experienced supervisor will accompany personnel when collecting samples for the first time.

NID is also responsible for monitoring and reporting water quality parameters to the Regional Water Quality Control Board (RWQCB). The draft General Permit State Water Resources Control Board Monitoring and Reporting Program is located below. Monthly Pesticide Use Reports are submitted to the RWQCB Executive Officer. Submitted reports comply with the provisions stated in "Standard Provisions and Reporting for Waste Discharge Requirements (NPDES)", Attachment C, Section 1B, "Monitoring and Reporting Requirements," to include the signatory requirements of Standard Provision B.2. A yearly annual report is also submitted to the SWRCB by January 31 of the following year. The Annual Report describes the objectives of the monitoring program, a summary of aquatic herbicide monitoring data obtained during the previous year, and interpretation of the data in relation to frequency, duration, and magnitude of impacts to beneficial uses. A copy of the most recent Annual Report submitted by NID is included in Appendix G.

Data Analyses and Mitigative Measures

Where low levels of alkalinity indicate increased toxicity of copper and more stringent water quality criteria, reduced levels of copper compounds and/or greater dilution of treated waters will be implemented to reduce these potential impacts to a level below significance. An alternative mitigative measure that may be appropriate would be to increase levels of alkalinity in treated waters prior to discharge.

The listed species of invertebrate that may occur in the affected environment is the valley elderberry longhorn beetle. This species is associated with its host plant, the elderberry shrub. Impacts to this shrub and the beetle will be avoided by not using herbicides within 50 feet of any shrubs that may occur in the affected environment.

If listed salmonids, amphibians, or reptiles are found during surveys, herbicides will not be applied in those areas. Significant impacts to these species will be avoided by conducting pre-application surveys in those canal systems in which these species are most likely to occur.

Flow data and herbicide monitoring data will be used to calculate the concentrations of herbicides in receiving bodies beyond the mixing zone. If required, the levels of herbicides in receiving bodies will be reduced by either greater dilution or lower levels of

pesticide use. Flow data will also be used to determine herbicides application rates so that the minimum effective amounts are used.

Attachment E
to Water Quality Order
No. 200_-__-DWQ
November 26, 2003

STATE WATER RESOURCES CONTROL BOARD

MONITORING AND REPORTING PROGRAM

WATER QUALITY ORDER NO 2004_-__-DWQ
STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FOR DISCHARGE OF AQUATIC PESTICIDES FOR AQUATIC WEED CONTROL IN IRRIGATION SYSTEMS, DRINKING WATER CANALS, AND SURFACE WATER IMPOUNDMENTS THAT ARE WATERS OF THE UNITED STATES
GENERAL PERMIT NO. CAG_____

A. MONITORING PROVISIONS

1. **Sampling Procedures.** Unless otherwise approved by the appropriate Regional Water Quality Control Board (Regional Board) Executive Officer, all analyses shall be conducted at a laboratory certified for such analyses by the California Department of Health Services. All analyses shall be conduced in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants," promulgated by the U.S. Environmental Protection Agency (USEPA).

2. **Monitoring Frequency.** If the discharger monitors any constituent more frequently than required by this General Permit, the monitoring results shall be submitted to the appropriate Regional Board.

3. **Retention of Records.** The discharger shall retain records of all monitoring information including all calibration and maintenance records, copies of all reports required by this General Permit, and records of all data used to complete the application for this General Permit. Records shall be maintained for a minimum of three years from the date of the sampling, measurement, or report. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the appropriate Regional Board Executive Officer.

4. **Monitoring Records.** Records of monitoring information shall include the following:

   a. The date, exact place, and time of sampling or measurements;

   b. The individuals who performed the sampling or measurements;

   c. The dates analyses were performed;

   d. The individuals who performed the analyses;

   e. The analytical techniques or method used; and

f. The results of such analyses.

5. **Device Calibration and Maintenance.** All monitoring instruments and devices that are used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy.

B. RECEIVING WATER MONITORING

1. Dischargers that have not completed and validated a Compliance Protocol shall collect samples at all discharge points to non-target surface waters before reopening gates or discharging to non-target surface waters after each aquatic pesticide treatment. Samples shall be collected in compliance with the following procedures:

    a. **Flowing Systems.** The following monitoring is required for aquatic pesticide applications to flowing systems:

        i. Grab samples shall be collected at mid-depth and analyzed for residual aquatic pesticide active ingredients at each gate that discharges to non-target surface waters or discharge point from the Treatment Area, except those discharges to irrigators (samples shall be collected before reopening the gates).

        ii. During the first treatment of each aquatic pesticide application season, the discharger shall sample for chronic toxicity at a point upstream of aquatic pesticide application, and at a discharge point to non-target surface waters where prior sampling has shown residual aquatic pesticide active ingredients concentrations to be the highest (samples shall be collected at mid-depth before reopening gates). See section C, Chronic Toxicity Monitoring, of this MRP for additional toxicity monitoring requirements. The following monitoring is required during toxicity monitoring:

Constituent	**Units**
Temperature	Degrees C
PH	pH units
Dissolved Oxygen	mg/l

    b. **Non-Flowing Systems.** Samples shall be collected before discharge from the Treatment Area. Sampling analysis shall include the following:

        i. Grab samples shall be collected at any two points within the Treatment Area and analyzed for residual aquatic pesticide active ingredients. Samples shall be collected before releasing treated water. Samples shall be collected at mid-depth.

        ii. During the first treatment of each aquatic pesticide application season, the discharger shall sample for chronic toxicity within the Treatment Area before discharging treated water. A sample shall also be collected and analyzed for chronic toxicity upstream of the Treatment Area. See section C, Chronic

Toxicity Monitoring, of this MRP for additional toxicity monitoring requirements. Samples shall be collected at mid-depth. The following monitoring is required during toxicity monitoring:

Constituent	Units
Temperature	Degrees C
PH	pH units
Dissolved Oxygen	mg/l

2. **Compliance Protocol Monitoring.** Dischargers that have completed and validated a Compliance Protocol shall monitor in accordance with section B.1.a (for flowing systems) or section B.1.b (for non-flowing systems), Receiving Water Monitoring, of this MRP during the first treatment of each aquatic pesticide application season (only).

C. CHRONIC TOXICITY MONITORING

The discharger shall conduct freshwater chronic toxicity tests on grab samples taken from receiving water sample locations specified in this MRP.

1. Test Species and Methods

   a. The discharger shall conduct short-term tests with Cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test); fathead minnow, *Pimephales promelas* (larval survival and growth test); and green alga, *Selanastrum capricornutum* (growth test) for the first test for each aquatic pesticide formulation used (screening period). After this screening period, monitoring shall be conducted using the most sensitive species, specific to each aquatic pesticide formulation.

   b. The presence of chronic toxicity in freshwater shall be estimated as specified in USEPA's methods (EPA/821-R-02-013).

2. Evaluation of Receiving Water Toxicity:

   If chronic toxicity is detected in treated waters, and upstream or untreated waters do not exhibit chronic toxicity for a sampling event, the discharger shall begin increased toxicity monitoring as described below. If upstream, untreated chronic toxicity sampling exhibits toxicity, the sampling event is inconclusive and no additional monitoring is required.

3. Increased Toxicity Monitoring. If a sample indicates that the discharge is causing receiving water chronic toxicity, as determined under section C.2 of this MRP, the discharger shall:

   a. Monitor for chronic toxicity at the next aquatic pesticide application of same active ingredient. If toxicity is not observed, the discharger shall continue regular monitoring as described in section B of this MRP.

   b. If the second test (toxicity test required under section C.3.a of this MRP) indicates toxicity, the following dilution series shall be initiated: 12.5, 25, 50, 75, and 100 percent. Dilution

series results will be used to determine the magnitude of the toxicity and shall be submitted to the Regional Board with regularly scheduled monitoring reports under section D of this MRP.

Further, the discharger shall conduct a toxicity identification evaluation[1] (TIE) and draft and implement additional best management practices (BMPs) in order to reduce toxicity caused by aquatic pesticide applications. The discharger shall also contact the Regional Board at the earliest convenience (no later than two weeks after toxicity is observed in the second test required under section C.4.a of this MRP) and report verbally or by letter that toxicity was detected and the steps that are being taken to address the toxicity.

c. The discharger shall continue increased monitoring for toxicity (beginning with section C.3 of this MRP) at subsequent pesticide applications, conducting TIEs, and implementing BMP modifications until toxicity is no longer observed during a sampling event, as indicated in C.3.a of this MRP.

d. If a discharger's BMP modifications are ineffective and six consecutive sampling events indicate that receiving water toxicity is being caused by the discharger, the discharger shall conduct a toxicity reduction evaluation[2] (TRE). The TRE shall be initiated within 15 days of the sixth exceedance and shall include all reasonable steps to eliminate the source of toxicity.

D. COMPLIANCE PROTOCOL VALIDATION SAMPLING

The following monitoring programs for compliance assessment with General Permit Receiving Water Limitations, section C, are for verifying discharger Compliance Protocols described in section D.6.c, Aquatic Pesticide Use Requirements, of the General Permit. The discharger shall only be allowed to monitor in accordance with Receiving Water Monitoring, section B.2 once the discharger develops a Compliance Protocol and submits the following monitoring results to the Regional Board.

Compliance Protocols shall be aquatic pesticide formulation specific, and dischargers shall certify that the requirements of the Protocol were observed during each treatment. Any deviation from the Protocol would require the discharger to monitor in accordance with Receiving Water Monitoring, section B.1 of this MRP.

1. **Freshwater Turnover, General Permit, section D.6.b.iii.** Dischargers shall calculate the freshwater turnover rate or rate at which the volume within the Treatment Area is replaced by fresh, non-treated water. The area within the Treatment Area that has the slowest rate of turnover shall be used to calculate the turnover rate. The following monitoring is required after two complete turnovers:

    a. Grab samples shall be collected and analyzed for residual aquatic pesticide active ingredients at each gate that discharges to non-target surface waters or discharge point from the Treatment Area, except those discharges to irrigators (samples shall be collected at mid-depth before re-opening the gates).

[1] Toxicity Identification Evaluation is a set of procedures to identify the specific chemical(s) responsible for toxicity. These proceedures are performed in three phases: characterization, identification, and confirmation, using aquatic organism toxicity tests.

[2] Toxicity Reduction Evaluation is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. For additional information, see Appendix 1-5 of the Policy.

b. Samples shall be collected and analyzed for chronic toxicity at a point upstream of aquatic pesticide application and at a discharge point from the Treatment Area to non-target surface waters where prior sampling has shown aquatic pesticide active ingredients concentrations to be the highest (samples shall be collected at mid-depth before re-opening the gates). See section C, Chronic Toxicity Monitoring, of this MRP for additional toxicity monitoring requirements. The following monitoring is required during toxicity monitoring:

Constituent	**Units**
Temperature	Degrees C
pH	pH units
Dissolved Oxygen	mg/l

Samples shall be taken before opening gates to non-target surface waters.

2. **Dissipation, General Permit, section D.6.b.iii.** Dischargers shall complete a dissipation study for non-flowing systems to determine a holding time where aquatic pesticide residual levels meet all the requirements of section C, Receiving Water Limitations, of this General Permit. The discharger shall hold the treated water for the prescribed period, and perform the following monitoring:

   a. Grab samples shall be collected at any two points within the Treatment Area, and analyzed for residual aquatic pesticide active ingredients. Samples shall be collected at mid-depth before releasing treated water.

   b. Samples shall be collected and analyzed for chronic toxicity at one point within the Treatment Area and another point upstream of the Treatment Area. Samples shall be collected at mid-depth before releasing treated water. See section C, Chronic Toxicity Monitoring, of this MRP for additional toxicity monitoring requirements. The following monitoring is required during toxicity monitoring:

Constituent	**Units**
Temperature	Degrees C
pH	pH units
Dissolved Oxygen	mg/l

The above validation monitoring shall only be required one time as long as the monitoring shows compliance with General Permit section C, Receiving Water Limitations. The above 'one time' monitoring shall be repeated if the discharger changes the Compliance Protocol or violates any General Permit, section C, Receiving Water Limitation. The discharger shall submit the Validation Sampling Results to the Regional Board before assessing compliance via the Protocol, as discussed in section D.6 of the General Permit.

E. ADDITIONAL MONITORING REQUIRED FOR PUBLIC ENTITIES LISTED IN ATTACHMENT E

Public entities listed in Attachment D shall choose one of the following monitoring plans to assess compliance with applicable water quality objectives (WQOs) in receiving waters.

1. The discharger shall annually monitor, at the end of the application season, a downstream water body that receives treated water during treatment events. The water body shall be representative of other receiving waters within the discharger's aquatic pesticides application project. Grab samples shall be collected near the discharge from the canal or surface water impoundment and upstream of the canal discharge point. Samples shall be analyzed for each active ingredient that was used during the previous year of treatment, and toxicity. Toxicity testing shall be conducted in accordance with sections C.1 and C.2 of this MRP.

   If, in accordance with section C.2, a sampling event exhibits chronic toxicity the discharger is not required to begin increased toxicity monitoring as indicated in section C.3. However, the discharger shall conduct a TIE and implement additional BMPs in order to reduce toxicity in downstream receiving water bodies resulting from aquatic pesticide applications.

2. Instead of individual monitoring as described above, the discharger may take part in a Region-wide monitoring program for aquatic pesticide applicators that addresses section E.1 monitoring at representative sites.

Monitoring results shall be submitted annually according to the requirements of section F, Reporting, of this MRP. If monitoring results show that public entities with section 5.3 exemptions (of the Policy) are causing impairment of receiving water beneficial uses, the Regional Board may decide to require the public entities to comply fully with Receiving Water Limitations, section C, of this General Permit.

F. REPORTING

1. All reports shall be submitted to the appropriate Regional Board. All reports submitted in response to this General Permit must comply with the provisions stated in "Standard Provisions and Reporting for Waste Discharge Requirements (NPDES)" (Attachment C), section B, Monitoring and Reporting Requirements.

2. Annual reports shall be submitted to the appropriate Regional Board. The reports shall contain the following information:

   a. Summary of General Permit violations and any BMP modifications addressing Permit violations.

   b. Types and amounts of aquatic pesticides used at each application event during the monitoring period.

c. Indicate methods of compliance. For example, a discharger may be using acrolein- and copper-based aquatic pesticides, but have a validated Compliance Protocol for acrolein discharges.

d. Sampling results for all required monitoring under this MRP and any additional sampling conducted in compliance with section A.1 of this MRP. Sampling results shall indicate the collection date, Minimum Levels, and Method Detection Limits for each constituent analysis.

G. REPORT SCHEDULE

Monitoring reports shall be submitted to the Regional Board Executive Officer in accordance with the following schedule:

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

Appendix B — Nevada Irrigation District Aquatic Herbicide Monitoring and Reporting Plan

Nevada Irrigation District

AQUATIC HERBICIDE MONITORING AND REPORTING PLAN

January 17, 2002

1 INTRODUCTION

The intent of this monitoring plan is to provide the elements required under the National Pollutant Discharge Elimination System (NPDES) Permit for Discharges of Aquatic Pesticides to Surface Waters of the United States General Permit No. CAG990003. Those elements include the following:

1. Document compliance with the requirements of the General Permit.
2. Support the development, implementation and effectiveness evaluation of Best Management Practices (BMP).
3. Demonstrate the full restoration of water quality and protection of beneficial uses of the receiving waters following completion of pest control projects.
4. Identify and characterize aquatic pesticide application projects conducted by the discharger.
5. Assure that the plan provides for monitoring of projects that are representative of all pesticides and application methods used by the discharger.

2 AQUATIC WEED CONTROL PROGRAM

Formed in 1921, Nevada Irrigation District (NID) supplies irrigation and treated water to 22,000 customers within its 287,000-acre boundary, which ranges from the foothills east of Nevada City to the valley floor near Lincoln. The District operates and maintains 151 canals with a total length of 420 miles in Nevada, Placer and Yuba counties that carry water to irrigation customers and to the District's 8 water treatment plants. Flows in the canals range from 1 cubic foot per second to 130 cubic feet per second.

The District's weed control program was established to control unwanted vegetation from the canal right-of–ways and aquatic weeds within the canals that interfered with the operation and maintenance of the system. Over the years, the District has found that the use of herbicides is the most cost effective and safe method to control weeds. Table 2-1 lists the aquatic herbicides used by the District and the targeted type of weeds.

Table 2-1

Product	Active Ingredient	EPA No.	Type of Weed
Aquamaster/Rodeo	Glyphosate	524-343	Emergent, Floating, Grasses
Clearigate	Elemental copper	8959-51	Submerged
Copper Sulfate PD	Copper sulfate pentahydrate	1278-8	Algae
Cutrine Plus	Elemental copper	8959-10-AA	Submerged, Algae
Magnacide H	Acrolein	10707-9	Submerged

A map of the District canal system showing the herbicide application sites, and the types of herbicide applied is contained in Appendix A of the Quality Assurance Project Plan.

The bulk of the pesticide applications coincide with the District's irrigation season, which runs from April 15th to October 15th. A small number of glyphosate applications are made after the end of irrigation season.

All applications are made directly into the canals at concentrations specified on the herbicide's label. Due to the manner in which the canal system is configured and operated, there are few locations where canal water is released

3 Best Management Practices

The District's Best Management Practices for the Application of Aquatic Pesticides is contained in Appendix A.

4 Quality Assurance Project Plan

The District has prepared a Quality Assurance Project Plan (QAPP) that provides references, standardized procedures and quality specifications for the sampling, analysis, and data review for the monitoring program. A copy of the QAPP is attached.

5 Site Selection

The following criteria were evaluated when choosing the sampling sites:

- Safety of access
- Permission is granted from private property owners
- Flow in waterway during the summer is sufficient for sampling

Table 5-1 summarizes the representative sites selected for this project and the type of herbicide to be monitored.

Table 5-1

Canal	Nearest Road Crossing	Receiving Water	Herbicide
Riffle Box	Pleasant Valley Road	Squirrel Creek	Cutrine Plus, Glyphosate
Auburn Ravine I/ Doty North	Gold Hill Road	Doty Ravine	Cutrine Plus
Gold Hill I	Joeger Road	Deadman's Ravine	Cutrine Plus
Livingston	Mt. Vernon Road	Sailor's Ravine	Magnicide H

Maps of the sites may be found in Appendix B. Coordinates of the sampling sites will be determined once the District has purchased GPS equipment.

The plan calls for collecting samples upstream and downstream of the point where canal waters are introduced into the receiving waters.

6 Water Quality Analyses

Table 6-1 lists pertinent information on the analyses that will be performed:

Table 6-1

Reference Parameters	Methods	Holding Time	Containers	Preservation	Storage
Glyphosate	EPA 547	14 days	125ml glass	10 mg $Na_2S_2O_3$	4^{O} C
Copper	EPA 200.7	6 months	½ pint plastic	Nitric acid	
Acrolein	EPA 8260	14 days	3 VOA's	Hydrochloric acid	4^{O} C

7 Sampling Frequency

The District plans to take samples at each of the above listed sites after each application of aquatic pesticides. Generally an application will be made every three to four weeks. The timing for taking the samples will be dependent on the estimated time that it takes for the treated canal water to reach the sampling point.

8 Field Procedures

Each employee performing the sampling will be given a copy of the QAPP. Initial training on sampling techniques will also be provided with the assistance of the laboratory chosen to perform the sample analyses.

9 Reporting

All reports under this program shall be submitted to the appropriate RWQCB Executive Officer. All reports submitted must comply with the provisions stated in "Standard Provisions and Reporting for Waste Discharge Requirements (NPDES)" (Attachment C), Section 1B, "Monitoring and Reporting Requirements," including the signatory requirements of Standard Provision B.2.

In addition to the monthly Pesticide Use Reports, the District shall submit a calendar year Annual Report to the SWRCB by January 31 of the following year. The Annual Report shall contain tabular summaries of the pesticide monitoring data obtained during the previous year in a format that satisfies the requirements for inclusion in the Department of Pesticides Regulation's surface water database. The Annual Report shall include a summary including but not limited to (1) objectives of the monitoring program, (2) results, and (3) interpretation of data in relation to frequency, duration, and magnitude of impacts to beneficial uses.

APPENDIX A

BEST MANAGEMENT PRACTICES

Nevada Irrigation District
Best Management Practices
for the
Application of Aquatic Pesticides

1. Licensing, Pesticide Labeling, and Permits

Nevada Irrigation District (NID) has one licensed Pest Control Advisor (PCA), and employees who make aquatic herbicide applications possess Qualified Applicator Certificates.

Written pest control recommendations developed by the PCA ensure that use is consistent with the pesticide label.

NID has an Agricultural Pest Control Advisor Registration and Pest Control Business County Registration in Nevada, Placer and Yuba counties.

2. Notification Requirements

The Agricultural Commissioners in each of the three counties and the California Department of Fish and Game are notified of all aquatic pesticide applications. NID irrigation water customers are provided with a written schedule of Magnicide H applications.

3. Preliminary Site Evaluations

NID personnel routinely conduct preliminary site evaluations. Observations made during these evaluations determine which canals require treatment, whether the site is suitable for treatment, what precautions are required, and whether any options to treatment with pesticides are practical. Pest type and growth stages are also considered in order to help determine the treatment type.

4. Secondary Site Evaluations and Pre-Treatment Monitoring.

Secondary site evaluations are also conducted routinely by NID employees. Some of the factors considered are weed species present, growth stage, weed location, and weed density. These factors are used to help determine the appropriate control measure to use (mechanical removal or treatment with a pesticide). If pesticide treatment is chosen, this information will assist in determining which pesticide to use, the application rate for the pesticide, and the number of treatment sites required.

5. Alternative Control Measures.

The only current alternatives to pesticide use are manual or mechanical removal. Silt deposited in the canals is routinely cleaned manually or mechanically during the months of November to March. Although the primary reason for performing this work is to remove the silt buildup, it does remove some of the unwanted vegetation from the canals.

NID has considered mechanical weed control alternatives during the irrigation season of April to October. Due to the added cost, the disruption in service to customers, increased turbidity of the

canal water, and increased erosion of the canal banks, NID determined that the use of pesticides is the preferred alternative.

NID is constantly evaluating the pesticide treatment options available to it. Over the last several years, the treatment of choice for a number of the canals was switched from Magnicide H to Cutrine Plus or Clearigate due to cost considerations, efficacy of the treatment, and a reduction in the hazards of application.

Other options that have been considered recently are the use of barley straw to control algae, and applying an acetic acid solution to dry canals for the control of rooted aquatic weeds. The barley straw treatment has been ineffective. Although effective, the acetic acid treatment is extremely costly, and lacks an effective method of applying the solution to lengthy sections of canals.

Five years ago NID began a program of hydroseeding the banks of canals in areas containing highly erosive soils. This action has not only reduced the erosion of the canal banks but has reduced the amount of mechanical cleaning and pesticide usage as well.

NID addresses canal leakage and seepage through a routine program of either lining or encasing problem areas. A consequence of this program is a reduction in weed growth and therefore pesticide usage.

Other alternative controls that have been considered are mowing and burning. Neither have been pursued due to concerns of fire danger during the summer months.

6. BMP's done prior to and during treatment.

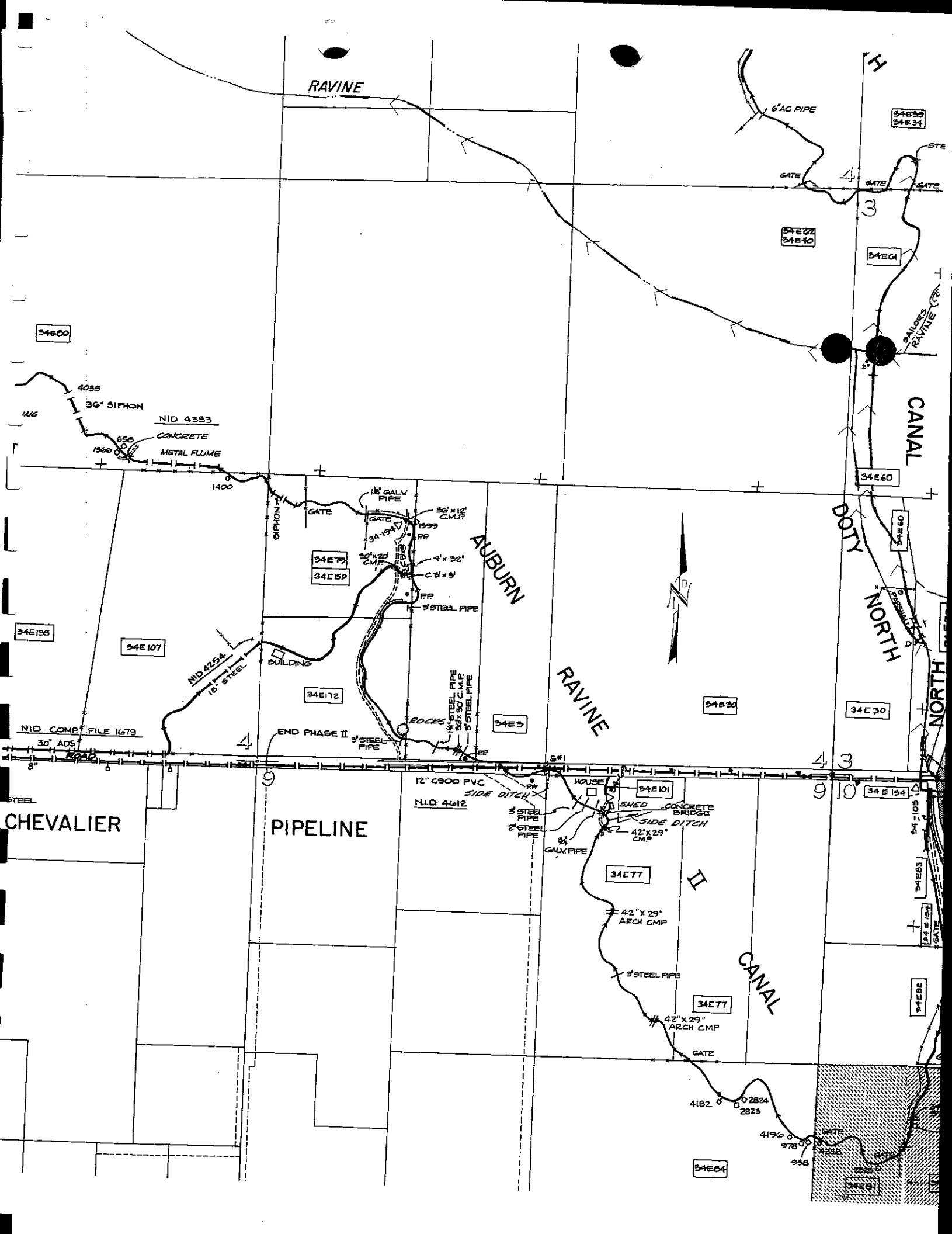
A Herbicide Application Evaluation is completed for each application. The Pest Control Advisor keeps these records on file.

7. Post-treatment Assessment.

Evaluations of treatment efficacy are performed routinely. They normally start about one week after the initial application, and continue for the rest of the irrigation season. If a treatment is deemed hazardous or ineffective then we either make corrective changes, eliminate that treatment type from a given area, or totally eliminate a type of treatment from our program. The term hazardous applies to any adverse impacts on beneficial uses of the treated water in the canal, or receiving waters. Of concern are impacts to fisheries, the presence of recreational activities such as swimming and boating immediately downstream of return flows to streams or waterways, and the proximity of the treatment site to one of the District's potable water treatment plants. If the control level is at a higher level than we consider necessary, we decrease the treatment rate or eliminate the treatment site.

APPENDIX B

SAMPLING SITE MAPS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34E34
GATE
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GATE
34E27
34E40
34E61
34E60
SAILORS RAVINE
CANAL
4035
36" SIPHON
NID 4353
658
1366
CONCRETE
METAL FLUME
1400
SIPHON
1½" GALV. PIPE
GATE
GATE
36"x12" C.M.P.
1999
34-194
PP
30"x20" C.M.P.
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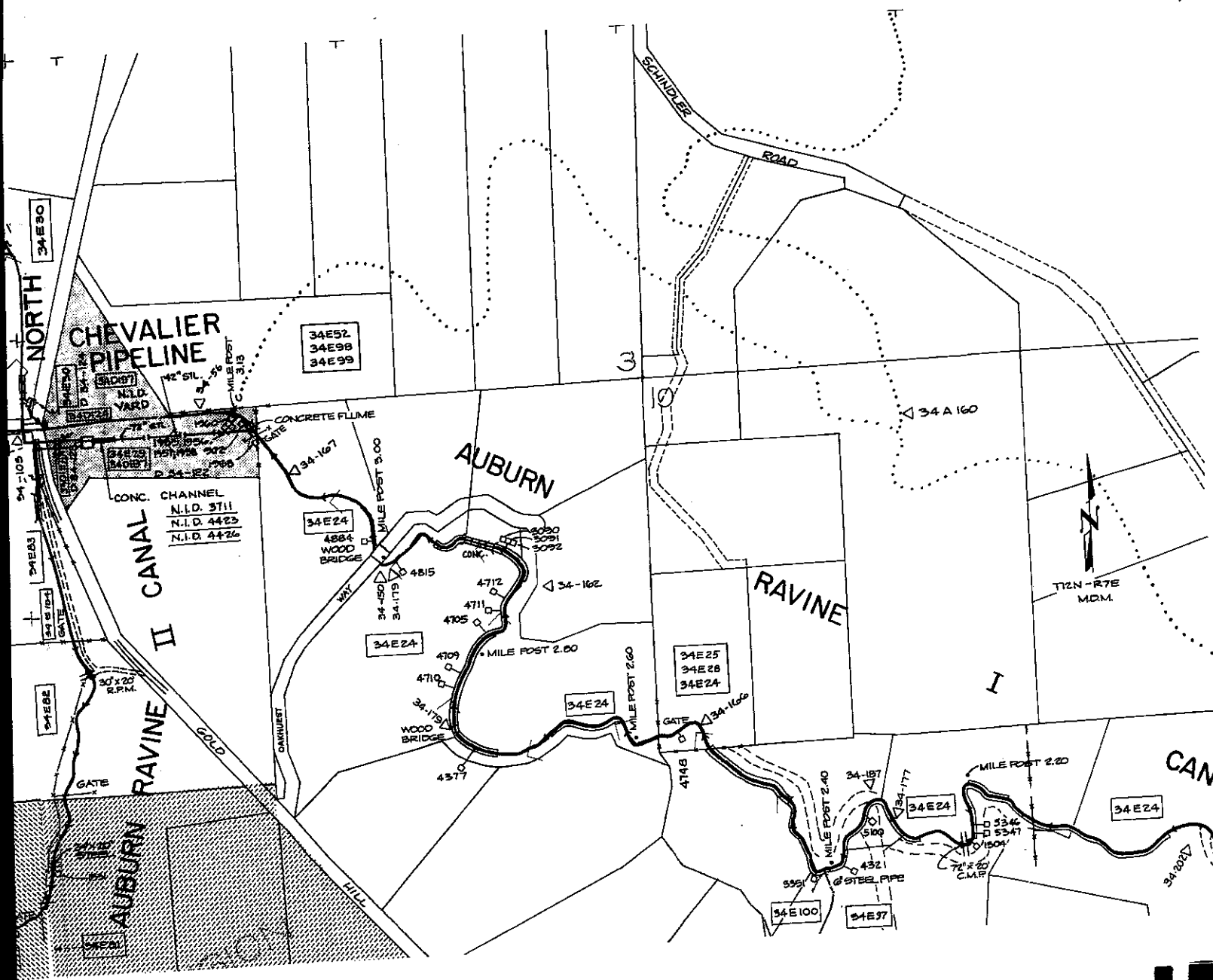
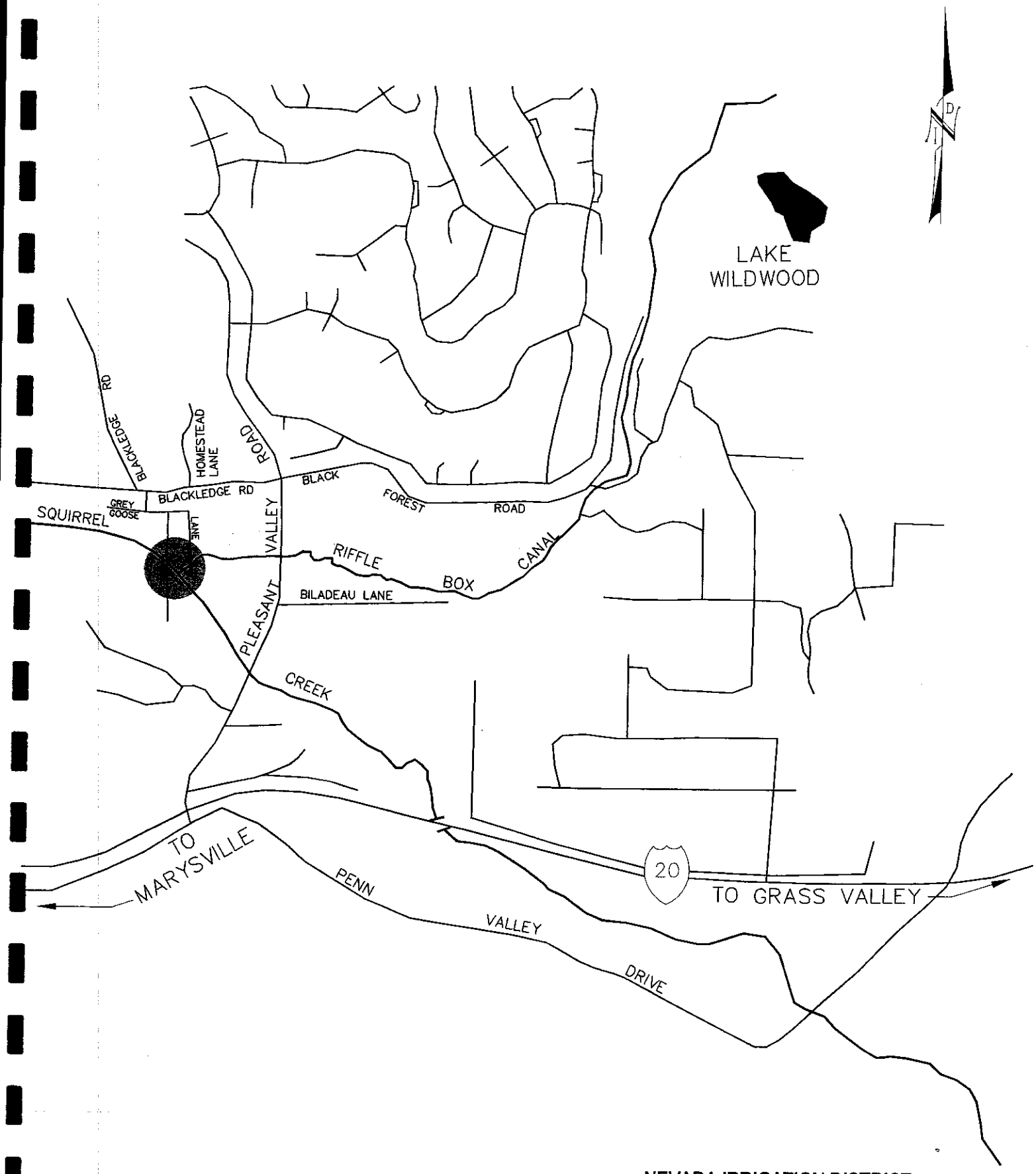
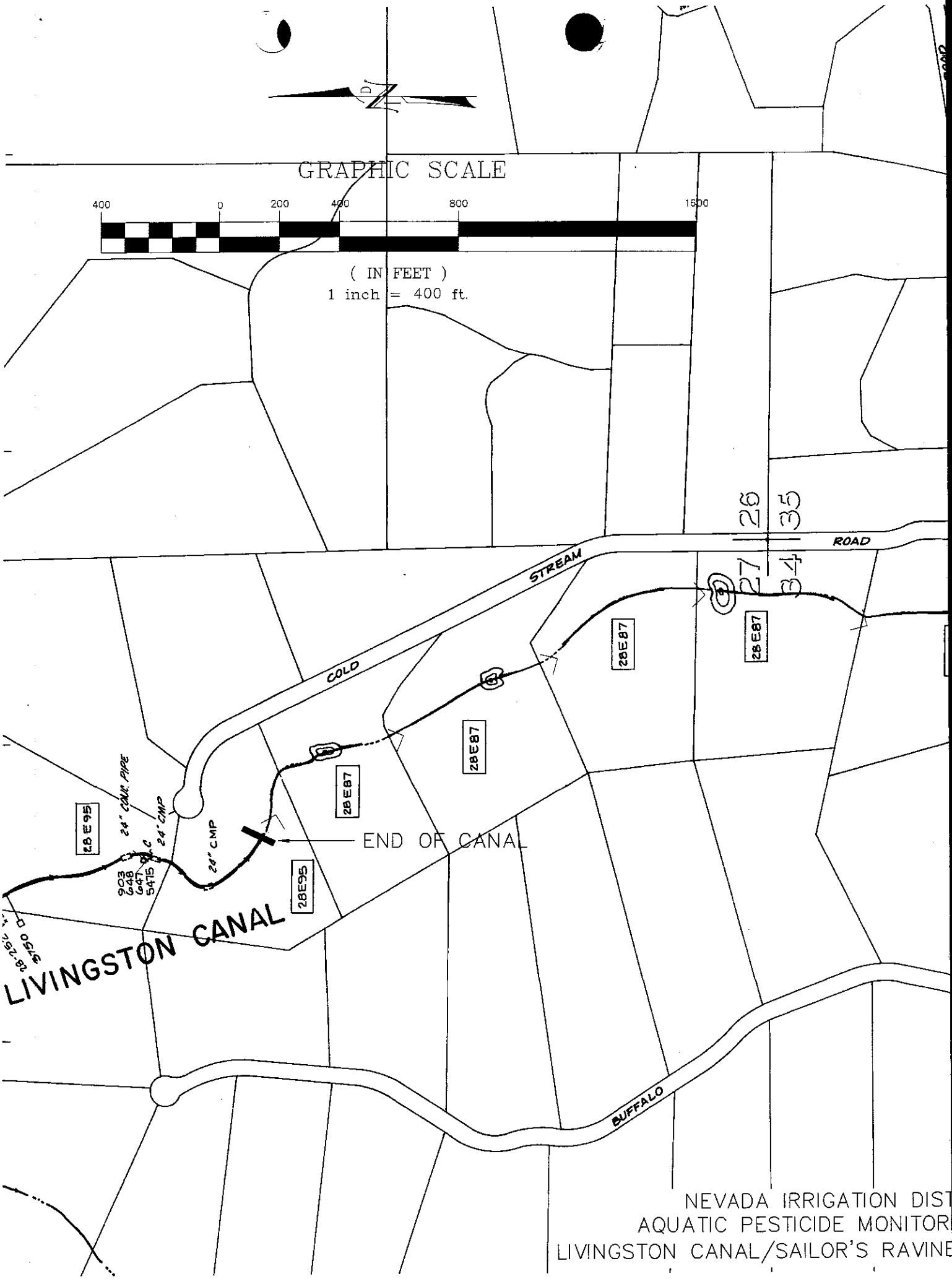
C 5'x 5'
PP
3' STEEL PIPE
34E79
34E159
AUBURN
DOTY
NORTH
34E135
34E107
NID 4254
18" STEEL
BUILDING
34E172
14" STEEL PIPE
36"x 30' C.M.P.
5' STEEL PIPE
ROCKS
PP
34E3
RAVINE
34E30
NID COMP. FILE 1679
30" ADS
ROAD
8"
END PHASE II
3' STEEL PIPE
12" C900 PVC
SIDE DITCH
N.I.D. 4612
PP
3' STEEL PIPE
2' STEEL PIPE
HOUSE
34E101
SHED
CONCRETE BRIDGE
SIDE DITCH
42"x29" CMP
¾" GALV. PIPE
CHEVALIER
PIPELINE
34E77
II
42"x 29" ARCH CMP
3' STEEL PIPE
34E77
42"x 29" ARCH CMP
CANAL
GATE
4182
2824
2823
4196
978
958
GATE
34E84
34E154
34E105
34E83
34E82
34E81

NEVADA IRRIGATION DISTRICT
AQUATIC PESTICIDE MONITORING PLAN
AUBURN RAVINE I–DOTY NORTH CANAL/DOTY RAVINE SAMPLING SITE

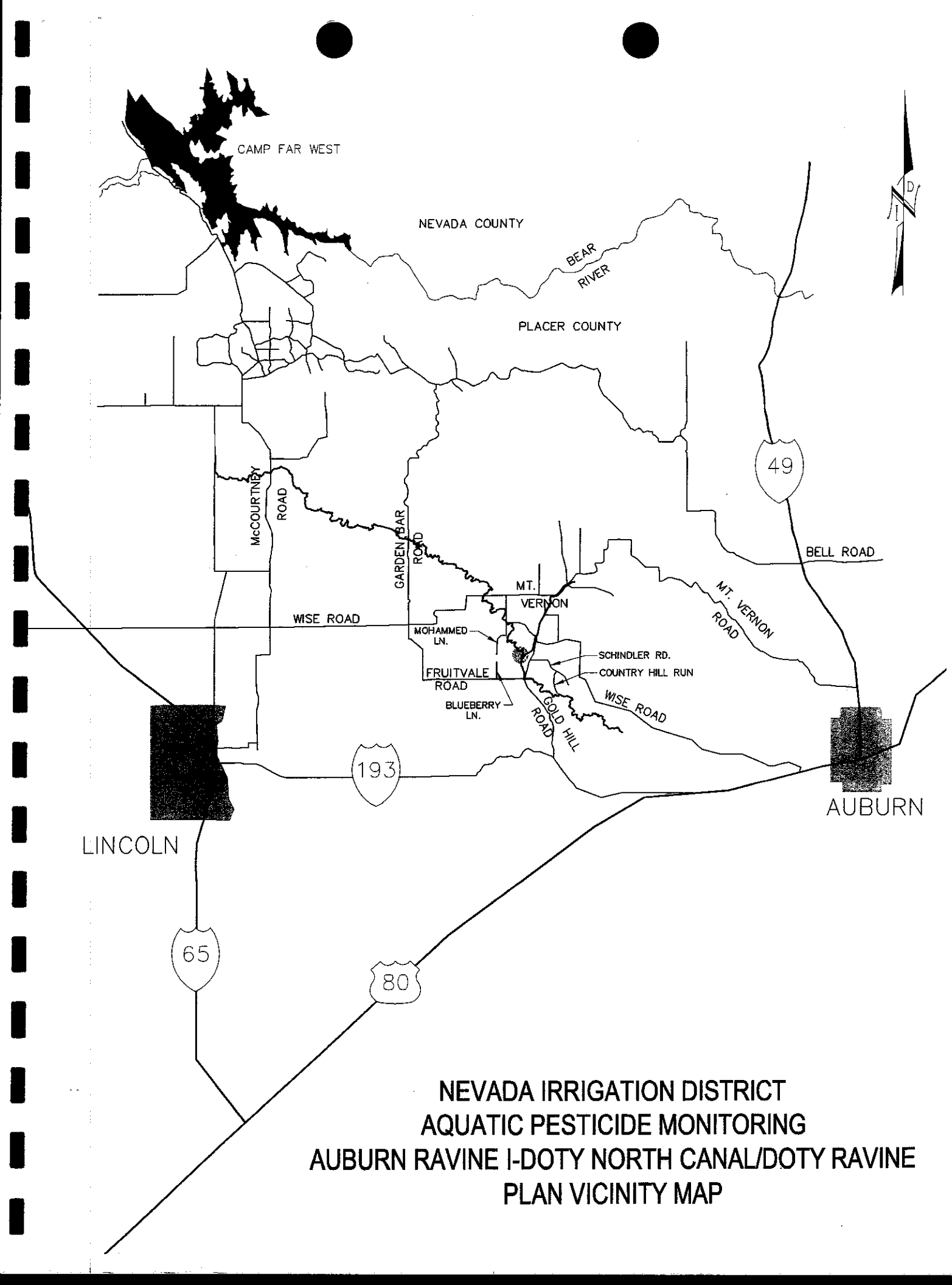




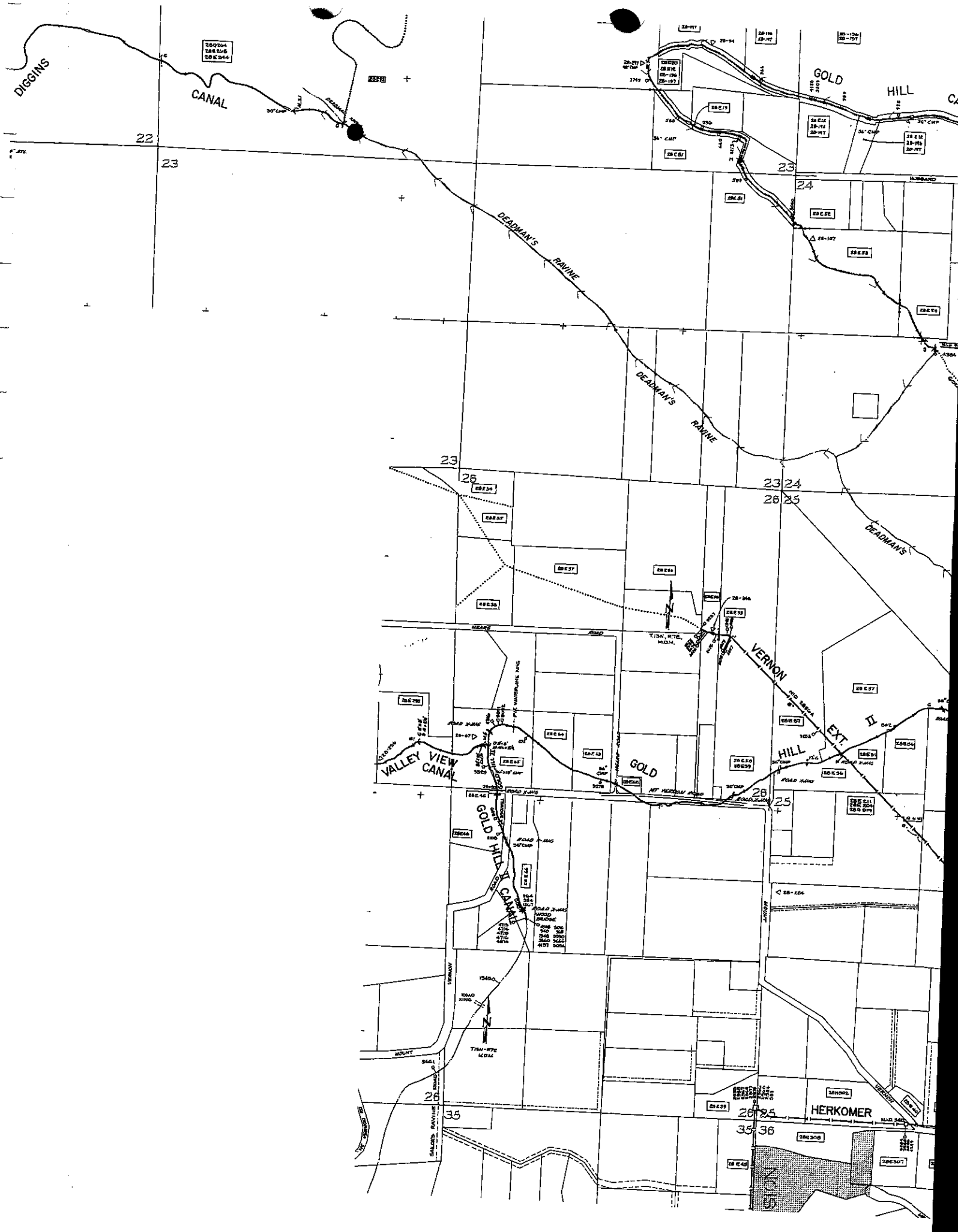
NEVADA IRRIGATION DISTRICT
AQUATIC PESTICIDE MONITORING PLAN
RIFFLE BOX CANAL/SQUIRREL CREEK
VICINITY MAP


GRAPHIC SCALE
400 0 200 400 800 1600
(IN FEET)
1 inch = 400 ft.
26
35
ROAD
27
34
STREAM
COLD
28E87
28E87
28E87
28E87
28E95
28E95
24" CORR. PIPE
24" CMP
24" CMP
903
648
647
5415
END OF CANAL
LIVINGSTON CANAL
BUFFALO
NEVADA IRRIGATION DIST
AQUATIC PESTICIDE MONITOR
LIVINGSTON CANAL/SAILOR'S RAVINE

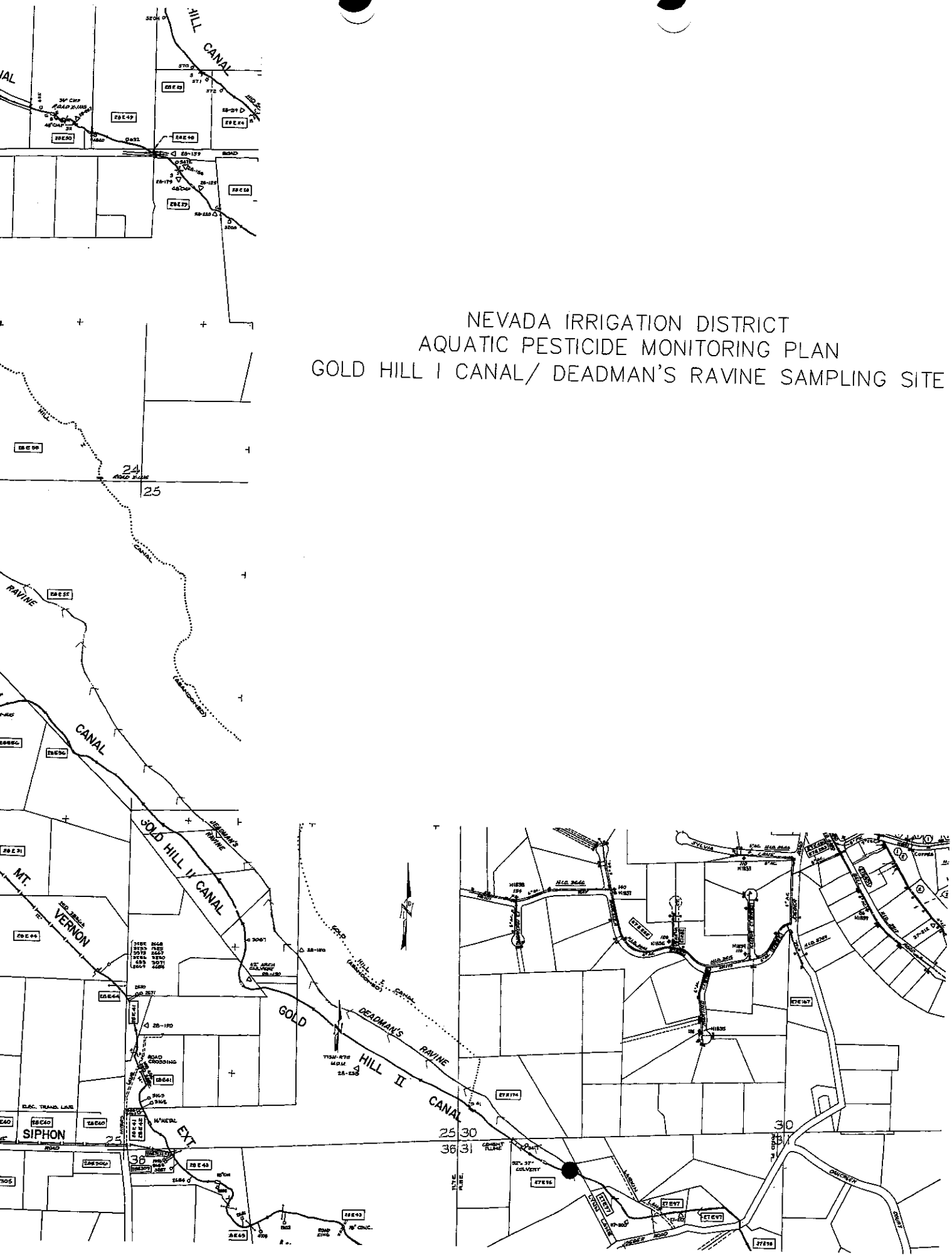
RICT
NG PLAN
SAMPLING SITE

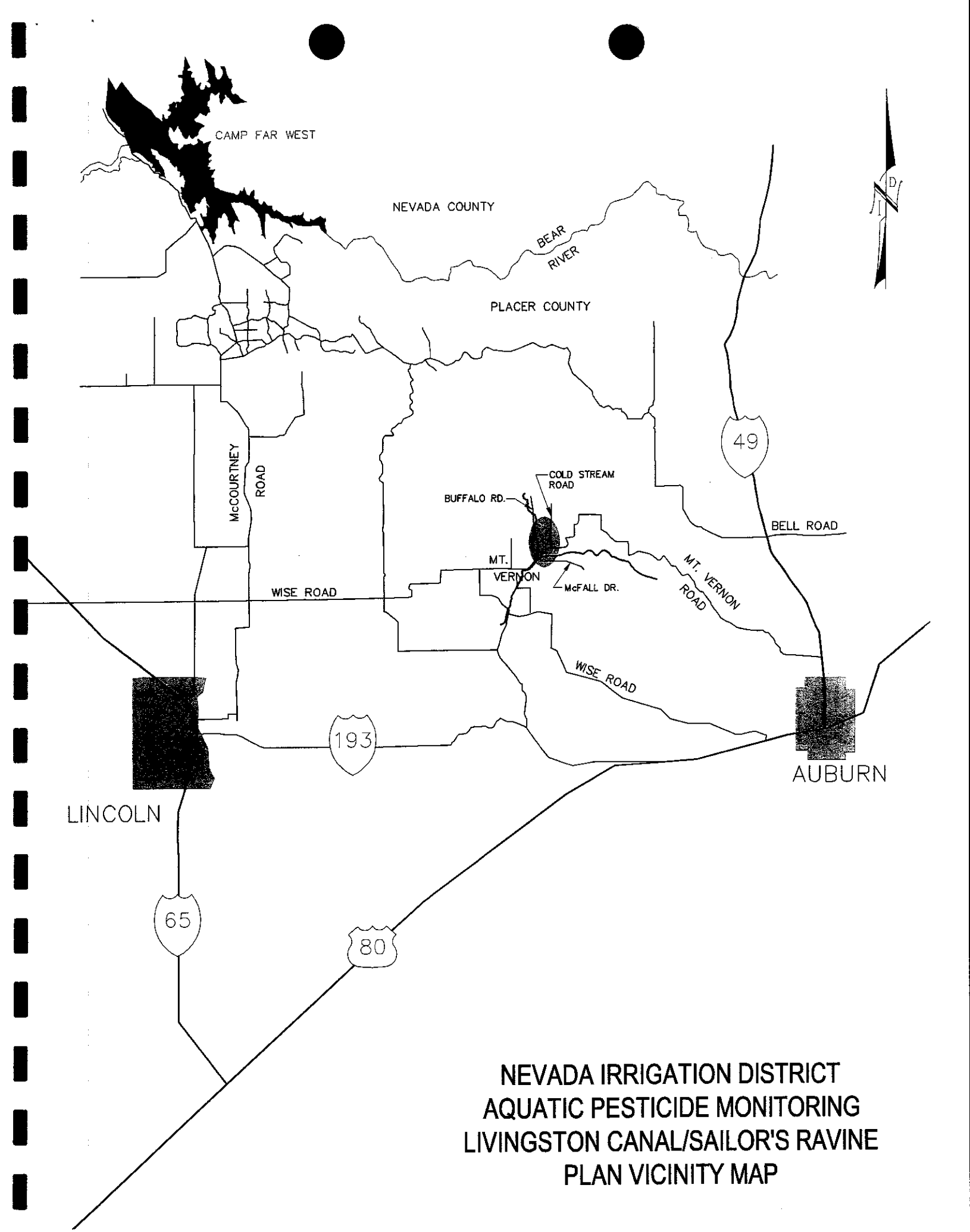


NEVADA IRRIGATION DISTRICT
AQUATIC PESTICIDE MONITORING
AUBURN RAVINE I-DOTY NORTH CANAL/DOTY RAVINE
PLAN VICINITY MAP

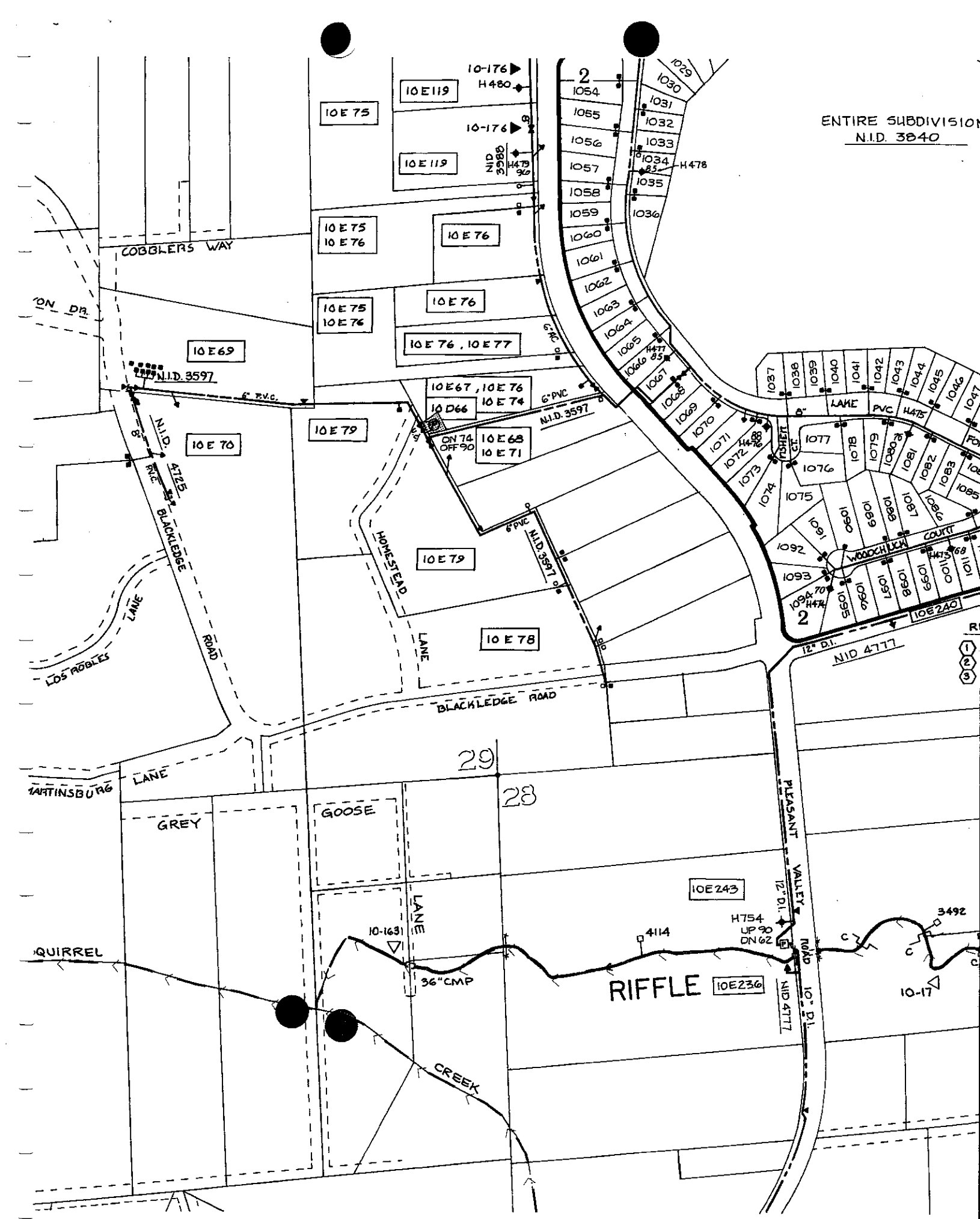

DIGGINS
CANAL
DEADMAN'S
RAVINE
GOLD
HILL
VERNON
EXT.
II
VALLEY VIEW
CANAL
GOLD HILL II CANAL
HERKOMER
MOUNT
VERNON
22
23
24
25
26
35
36

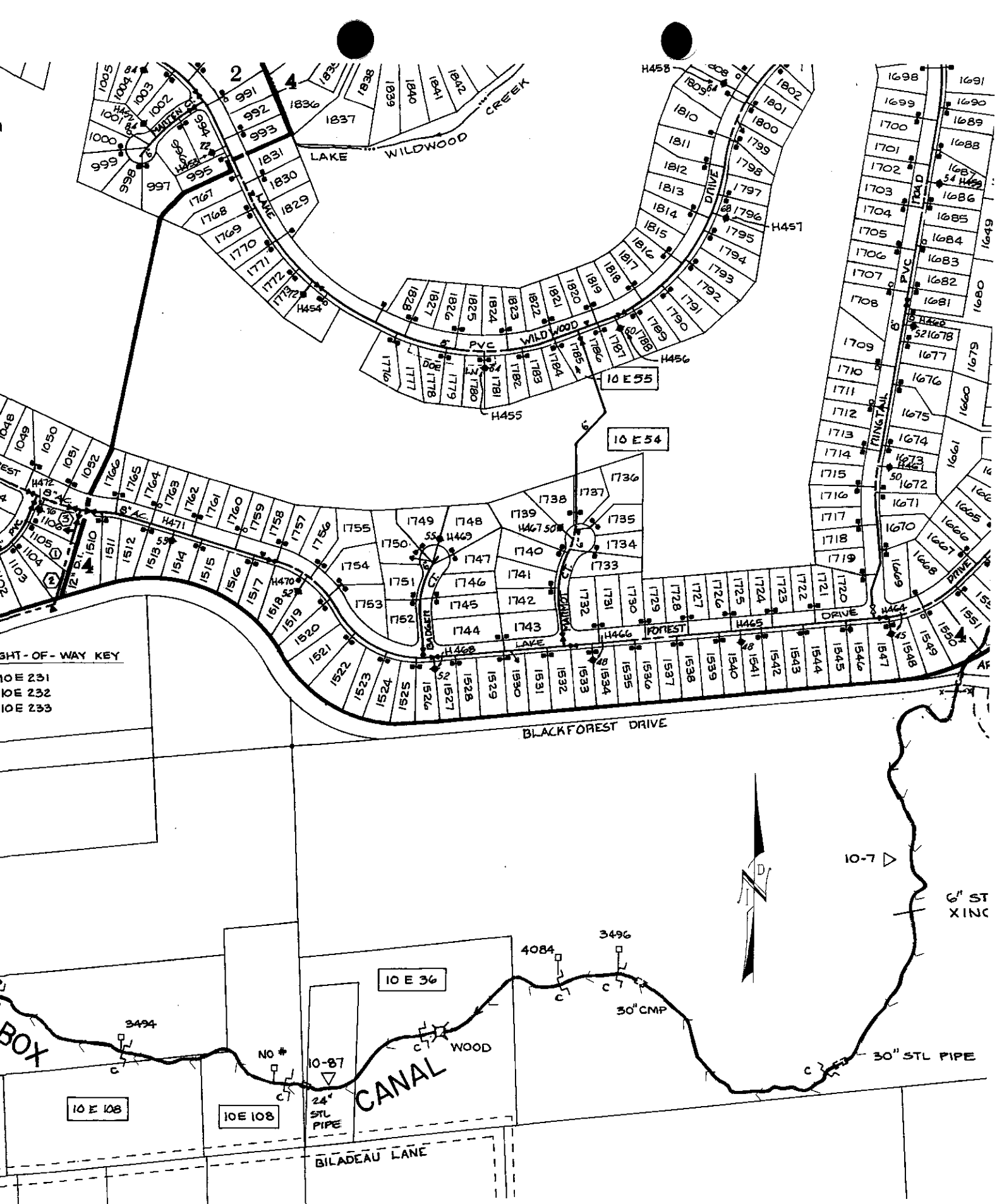
NEVADA IRRIGATION DISTRICT
AQUATIC PESTICIDE MONITORING PLAN
GOLD HILL I CANAL/ DEADMAN'S RAVINE SAMPLING SITE



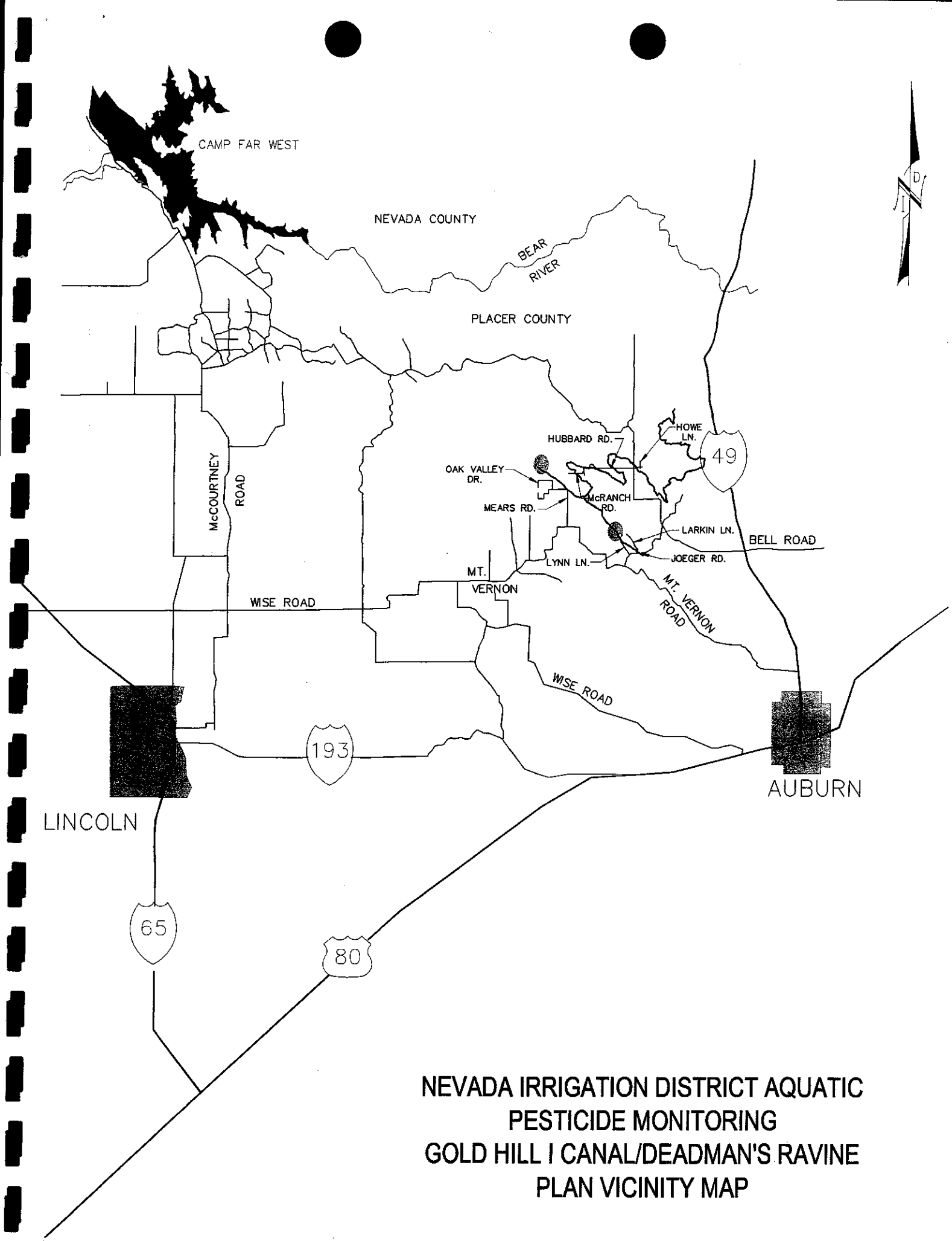


NEVADA IRRIGATION DISTRICT
AQUATIC PESTICIDE MONITORING
LIVINGSTON CANAL/SAILOR'S RAVINE
PLAN VICINITY MAP


ENTIRE SUBDIVISION
N.I.D. 3840
COBBLERS WAY
10E75
10E76
10E119
10E69
10E70
10E79
10E78
10E67, 10E76
10D66
10E74
10E68
10E71
10E76, 10E77
10E243
10E236
10E240
N.I.D. 3597
N.I.D. 4777
BLACKLEDGE ROAD
HOMESTEAD LANE
LOS ROBLES LANE
MARTINSBURG LANE
GREY GOOSE LANE
PLEASANT VALLEY ROAD
WOODCHUCK COURT
FISHER CT.
LAKE
RIFFLE
SQUIRREL CREEK
10-176
10-1631
10-17
H480
H479
H478
H477
H475
H754
4114
3492
36" CMP
12" D.I.
10" D.I.
8" PVC
6" PVC
6" P.V.C.
29
28
2



NEVADA IRRIGATION DISTRICT
AQUATIC PESTICIDE MONITORING PLAN
RIFFLE BOX CANAL & SQUIRREL CREEK SAMPLING SITE



NEVADA IRRIGATION DISTRICT AQUATIC PESTICIDE MONITORING
GOLD HILL I CANAL/DEADMAN'S RAVINE
PLAN VICINITY MAP

The following Appendices for the Nevada Irrigation District Quality Assurance Project Plan for the Aquatic Herbicide Monitoring and Reporting Plan are not provided in this document. These Appendices can be requested from the Nevada Irrigation District at the following address or phone number:

Nevada Irrigation District
1036 W Main St.
P.O. Box 1019
Grass Valley, CA 95945-1019

(530) 273-6185

Appendix for the Nevada Irrigation District Quality Assurance Project Plan for the Aquatic Herbicide Monitoring and Reporting Plan

A. Map of District Canal System
B. Surface Water Sampling SOP
C. Sample Log
D. Field Data Sheet
E. Field Instrument Calibration and Operation
F. Sample Label
G. Chain of Custody Form
H. Laboratory Quality Assurance Manual
I. QC Procedures for Pesticides
J. Field Audit Checklist
K. Data Review Checklist

Nevada Irrigation District

QUALITY ASSURANCE PROJECT PLAN

for the

AQUATIC HERBICIDE MONITORING AND REPORTING PLAN

January 17, 2002

1 INTRODUCTION

This Quality Assurance Project Plan (QAPP) presents the organization, functions, procedures, and specific quality assurance (QA) and quality control (QC) activities for collecting and analyzing samples under the aquatic weed control program of the Nevada Irrigation District. The primary users of this QAPP include the District staff performing fieldwork for this program and the laboratory performing analyses of the samples. Guidelines used to develop the specifications and procedures in this plan are presented here:

- *U.S. EPA Guidance on Quality Assurance Project Plans Final (U.S. EPA QA/G-5, February 1998)*

1.1 QAPP Objective and Use

The goal of the procedures and specifications established in this QAPP is to provide references, standardized procedures and quality specifications for the sampling, analysis and data review procedures required for monitoring aquatic herbicides in the District's canals. This QAPP also establish QA procedures for reviewing and documenting compliance with field and analytical procedures.

1.2 Project Planning Documents

This QAPP is the primary planning document needed for monitoring aquatic herbicides under this program. The QAPP details the specific activities and standard field procedures and specifications for this program. The QAPP and the standard operating procedures (SOPs) present the site-specific data quality objectives (DQOs) and sampling plans that identify sampling locations, number of samples, field procedures and analytical methods to be used.

To ensure that field activities conducted under this program are conducted in a safe manner, employees shall adhere to current District safety procedures.

2 PROJECT DESCRIPTION AND HISTORY

Formed in 1921, NID supplies irrigation and treated water to 22,000 customers within its 287,000-acre boundary. The District operates and maintains 151 canals with a total length of 420 miles in Nevada, Placer and Yuba counties that carry water to irrigation customers and to the District's 8 water treatment plants.

2.1 Site Description

A map of the District canal system showing the herbicide application sites, and the types of herbicide applied is contained in Appendix A.

2.2 Type of Herbicides Reported

The District's weed control program was established to control unwanted vegetation from the canal right-of –ways and aquatic weeds within the canals that interfere with the operation and maintenance of the system. Over the years, the District has found that the use of herbicides is the most cost effective and safe method to control weeds. The following table lists the herbicides that will be monitored in this program.

Product	Active Ingredient	EPA Number
Aquamaster	Glyphosate	524-343
Clearigate	Elemental copper	8959-51
Copper Sulfate PD	Copper sulfate pentahydrate	1278-8
Cutrine Plus	Elemental copper	8959-10-AA
Magnacide H	Acrolein	10707-9
Rodeo	Glyphosate	534-343

3 PROGRAM ORGANIZATION AND RESPONSIBILITIES

Bruce Early, Pest Control Superintendent, and Robin Lantz, Maintenance Manager, will be responsible for all aspects of the program.

The laboratory chosen to perform the analyses will be state certified. The laboratory is expected to provide the sample containers, perform the requested analyses, and provide the District with the resulting data.

4 DATA QUALITY OBJECTIVES AND QUALITY ASSURANCE OBJECTIVES

Data Quality Objectives (DQOs) and Quality Assurance Objectives (QAOs) are related data quality planning and evaluation tools for all sampling and analysis activities. A consistent approach for developing and using these tools is necessary to ensure that enough data are produced and are of sufficient quality to make decisions for this program.

4.1 DQOs and Data Use Planning

DQO's specify the underlying reason for collection of data, data type, quality, quantity, and uses of data collection. For this program, water sampling after each application is needed to document the magnitude of herbicides in canal water prior to and after applications.

4.1.1 Data Quality Category

For this program, definitive data derived from standard U.S. EPA or other reference methods in an analytical laboratory will be used. Data are to be analyte-specific, and both identification and quantitation are to be confirmed. Samples will be analyzed for the active ingredient of the herbicide being applied. Samples with detected concentrations of the active ingredient will be confirmed by gas chromatograph/mass spectrometer (GC/MS). These methods have standardized QC and documentation requirements, which provide information necessary to verify all reported results.

4.2 Quality Assurance Objectives (QAOs)

Quality assurance objectives are the detailed QC specifications for precision, accuracy, representativeness, and completeness (PARC). The QAOs presented in this QAPP represent the minimum acceptable specifications for field and analysis that should be considered for field and analytical procedures. The QAOs are then used as comparison criteria during the data quality review to determine if the minimum requirements have been met and if data may be used as planned.

4.2.1 Development of Precision and Accuracy Objectives

Laboratory control samples (LCSs) are used to determine the precision and accuracy objectives. LCSs are fortified with the active ingredient of the herbicide being analyzed to monitor the laboratory precision and accuracy. Analyzing several reagent spikes at different concentration levels will develop the LCSs for this program. These data will be compiled over a defined time period. Control charts will be developed for all target compounds. Until a sufficient number of samples are analyzed to compile at the minimum 20 LCSs or more for determining precision and accuracy limits, an 80-120% recovery range will be used in the interim. Field duplicates measure sampling precision and variability for comparison of project data. Acceptable relative percent differences (RPDs) are less than 50 for field duplicate analyses. If field duplicate sample results vary beyond these objectives, the results are further evaluated to identify the cause of the variability.

4.2.2 PARC Definitions

Precision measures the reproducibility of repetitive measurements. Precision is evaluated by calculating the RPD between duplicate spikes, duplicate sample analyses, or field duplicate samples and comparing it with appropriate precision objectives established in this QAPP. Analytical precision is developed using repeated analyses of identically prepared control samples. Field duplicate samples analyses results are used to measure the field QA and

matrix precision. Interpretation of precision data must include all possible sources of variability.

Accuracy measures correctness, or how close a measurement is to the true or expected value. Accuracy is measured by determining the percent recovery of known concentrations of analytes spiked into field sample or reagent water before extraction. The stated accuracy objectives for laboratory control samples and matrix spikes must reflect the sample concentration or middle of the calibration range.

Representativeness is obtained by using standard sampling and analytical procedures in this QAPP to generate data that is representative of the sites.

Completeness is calculated for each method and matrix for an assigned group of samples. Completeness for a data set is defined as the percentage of unqualified and estimated results divided by the total number of the data points. This represents the useable data for data interpretation and decision-making. Results qualified as rejected or unusable or that were not reported because of sample loss or breakage or analytical error will be subtracted from the total number of results to calculate completeness. The overall objective for completeness is 95%.

Table 5-1 Quality Control Acceptance Criteria

Analyte	Lab Control Spike (% Recovery)	Matrix Spike/Duplicte (% Recovery)[1]	Field Duplicate RPD	Surrogate (% Recovery)
Acrolein	80-120	80-120	50	70-130
Copper	80-120	80-120	50	70-130
Glyphosate	80-120	80-120	50	70-130

1. 15% RPD

5 FIELD PROCEDURES

This section includes brief descriptions of field procedures used for this program. Detailed equipment and procedure descriptions are included in the Surface Water Sampling SOP contained in Appendix B.

5.1 Site Selection

Proper site selection is critical to producing representative data. At least one representative site for each type of pesticide identified will be selected.

5.1.1 Sampling Locations

Sampling locations on the canals being treated are selected using a judgmental sampling approach. The criterion used to select sampling locations is based on whether the treated canal water is discharged directly into a natural watercourse.

5.2 Sampling Frequency and Duration

Collect samples from the receiving waters upstream and downstream of the point of discharge after each treatment. Treatments occur every 3 to 4 weeks during irrigation season (April-October). The timing of the sampling will initially be set based on a judgement of the treated water's travel time to the discharge point. This timing will be adjusted as necessary during the course of the project.

Treatment information shall be recorded on the Herbicide Application Report, and the sample information shall be recorded on the Sample Log shown in Appendix C.

5.3 General Field Sampling Requirements

The standard elements for field and sampling activities are addressed in this section.

5.3.1 Decontamination Procedures

All field and sampling equipment that may contact samples must be decontaminated after each use in a designated area. A detailed description of cleaning of equipment for water sampling is included in the Surface Water Sampling SOP contained in Appendix B.

5.3.2 Sample Storage, Preservation and Holding Times

Sample containers are pre-cleaned according to U.S. EPA specification for the appropriate methods. Table 5-2 lists the sample container, storage and preservation requirements for this QAPP.

Table 5-2 Sample Storage and Preservation Requirements

Reference Parameters	Methods	Holding Time	Containers	Preservation	Storage
Glyphosate	EPA 547	14 days	125ml Glass	10 mg $Na_2S_2O_3$	4° C
Copper	EPA 200.7	6 months	½ pint plastic	Nitric acid	
Acrolein	EPA 8260	14 days	3 VOA's	Hydrochloric acid	4° C

5.3.3 Documentation

All field activities must be adequately and consistently documented to support data interpretation and ensure defensibility of any data used for decision making. Examples of Field Data Sheets and other documentation required for this field procedure are included in Attachment D of this QAPP. Field personnel must record the following information:

- Names of field personnel;
- Site and sampling location identification;
- All field measurements such as pH, water temperature, conductivity, turbidity, and dissolved oxygen when applicable;
- Observation of weather and conditions that can influence sample results; and
- Any problems encountered during sampling.

5.3.4 Sample Identification Scheme

All samples must be uniquely identified to ensure that results are properly reported and interpreted. Samples must be identified such that a data reviewer or user can distinguish the canal, sampling location, sample date and time, matrix, sampling equipment and sample type (normal field sample or QC sample).

5.3.5 Field and Laboratory Staff Training

All staff performing field or laboratory procedures shall receive training to ensure that the work is conducted correctly and safely. At a minimum all staff shall be familiar with the field guidelines and procedures and the laboratory SOP included in this QAPP. All work shall be performed at least once under the supervision of experienced staff, field managers, laboratory managers or other qualified individuals before field staff perform procedures on their own.

5.4 Sample Collection Methods

Proper sampling techniques must be used to ensure that a sample is representative of the flow in the water body.

5.4.1 QC Sample Collection

Field blanks and field duplicates are collected at a frequency of approximately 1 per 20 normal samples. Matrix spikes are collected at frequency of approximately 1 pair per 20 normal samples.

5.4.2 Field Measurements

For all water bodies sampled, pH, electrical conductivity, turbidity, temperature and dissolved oxygen may be measured prior to collecting samples for laboratory analyses. Should the District decide to measure and collect this data, the field instrument calibration and operation of the instruments purchased will be contained in Appendix E.

5.4.3 Recordkeeping and Sample Handling Procedure

All data collected in the field are recorded on sample field sheets. Pertinent field information, including flow rate of the canal and water conditions, are recorded on the field sheets. Sample control information is documented in a master sample log. A chain of custody record is completed subsequent to sample collection.

6 SAMPLE CUSTODY AND DOCUMENTATION

Sample possession during all sampling efforts must be traceable from the time of collection until results are reported and verified by the laboratory and samples are disposed of. Sample custody procedures provide a mechanism for documenting information related to sample collection and handling.

6.1 Documentation Procedures

The field activity coordinator is responsible for ensuring that the field sampling team adheres to proper custody and documentation procedures. A master sample logbook is maintained for all samples collected during each sampling activity.

Field personnel have the following responsibilities:

- Keep an accurate written record of sample collection activities on the field form and logbook.
- Ensure that all entries are legible, written in waterproof ink and contain accurate and inclusive documentation of the field activities.
- Date and initial daily entries.
- Note errors or changes using a single line to cross out the entry an date and initial the change.
- Complete the chain of custody forms accurately and legibly.

A sample label is affixed to each sample collected. Sample labels uniquely identify samples with an identification number, analytical method requested, and date and time of sample collection. Appendix F contains an example sample label.

6.2 Chain of Custody Form

A chain-of-custody form is complete after sample collection, and prior to sample shipment or release. The form, sample labels and field documentation are cross-checked to verify sample identification, number of containers, sample volume and type of containers.

Information to be included in the chain-of-custody forms include:

- Sample identification
- Date and time of collection
- Sampler's initials
- Analytical methods requested
- Sample volume
- QC sample identification
- Signature blocks for release and acceptance of samples
- Any comments to identify special conditions or requests

Sample transfer between field staff, courier and laboratory is documented by signing and dating "Relinquished by" and "Received by" blocks whenever sample possession changes. If samples are not shipped on the collection day, they are refrigerated in a sample control area. An example of the chain-of-custody form is shown in Appendix G.

6.3 Sample Shipments and Handling

The original chain of custody form, which identifies the contents, accompanies all sample shipments, and a copy is retained in the project file.

All shipping containers are secured with chain of custody seals for transportation to the laboratory. Samples are either shipped to the laboratory according to Department of Transportation standard or picked up by the laboratory from the field. A generous amount of ice is packed with the samples. The ice must contact each sample and be approximately 2 inches deep at the top and bottom of the cooler. The ice may be contained in resealable bags, but must contact the samples to maintain temperature. The methods of shipment, courier name, and other pertinent information are entered in the "Received By" or "Remark" section of the chain of custody form.

The following procedures are used to prevent bottle breakage and cross contamination:

- Bubble wrap or other cushioning material is used to keep bottles from contacting one another to prevent breakage.
- Sample bottles are individually sealed in plastic resealable bags.
- All samples are transported inside hard plastic coolers.

- The coolers are taped shut and sealed with chain of custody seals to prevent accidental opening.
- Field staff must notify the laboratory sample control prior to shipment of the samples.

6.4 Laboratory Custody Procedures

The following sample control activities must be conducted in the laboratory:

- Initial sample log in and verification of samples received with the chain of custody form.
- Document discrepancies noted during log-in on the chain of custody.
- Initiate internal laboratory custody procedure.
- Verify sample preservation, such as temperature.
- Notify the project coordinator if any problems or discrepancies are identified.
- Proper sample storage, including daily refrigerator temperature monitoring and sample security.
- Return shipment of coolers.

7 FIELD INSTRUMENT CALIBRATION PROCEDURES

For this program several types of instruments may be used to monitor and evaluate physical parameters in water. To ensure that the instruments are operating properly and producing accurate and reliable data, routine calibration must be performed prior to and during use. Calibration should be performed at a frequency recommended by the manufacturer. Field calibration should be performed prior to using the instrument. If field calibration reveals that the instrument is outside established accuracy limits, the instrument should be serviced in the field. Backup units must be available for each of the critical real time instruments used in the field.

The field instruments and their operation and calibration are described in Appendix E.

8 ANALYTICAL PROCEDURES AND CALIBRATION

This section describes the analytical methods and calibration procedures for the surface water samples that will be collected for this program.

The analytical methods included in this QAPP are published in the U.S. EPA *Test Methods for Evaluating Solid Waste Physical/Chemical SW 846* or U.S. EPA *Method for Chemical Analysis of Water and Waste.* The primary methods that will be used in this program are:

Method 8260 - Acrolein
Method 200.7– Copper
Method 547 - Glyphosate

Appendix I of this QAPP includes a copy of these methods.

8.1 Detection and Quantitation Limits

The method detection limit (MDL) is the minimum analyte concentration that can be measured and reported with a 99% confidence that the concentration is greater than zero. The quantitation limit (QL) represents the concentration of an analyte that can be routinely measured in the sample matrix within stated limits and confidence in both identification and quantitation. These detection limits will be used as project quantitation limits.

9 DATA REDUCTION, VERIFICATION, AND REPORTING

The laboratory data reduction, verification, and reporting procedures ensure that complete documentation is maintained, transcription and reporting errors are minimized, and data received from laboratory are properly reviewed.

The laboratory analyst performing the analyses is responsible for the reduction of the raw data generated at the laboratory bench to calculate the concentrations. The analytical process includes verification or a quality assurance review of the data. This includes:

- Verifying the calibration samples for compliance with the laboratory and project criteria;
- Verifying that the batch QC were analyzed at a proper frequency and results were within specifications;
- Comparing raw data (e.g., chromatogram) with reported concentration for accuracy and consistency;
- Verifying that holding times were met and that reporting units and quantitation limits are correct;
- Determining whether corrective action was performed and control was reestablished and documented prior to re-analysis of QC or project samples;
- Verifying all project and QC sample results were properly reported and flagged; and
- Preparing batch narratives that adequately identify and discuss any problems encountered.

The QC check is conducted at several levels by the laboratory analyst, supervisors, and laboratory quality assurance staff. The specific procedures are documented in the laboratory quality assurance manual. After the data have been reviewed and verified, the

laboratory reports are signed for release and distributions. Raw data and supporting documentation is stored in confidential files by laboratory document control.

10 INTERNAL QUALITY CONTROL (QC)

Internal quality control (QC) is achieved by collecting and/or analyzing a series of duplicate, blank, spike and spike duplicate samples to ensure that analytical results are within the specified QC objectives. The QC sample results are used to quantify precision and accuracy and identify any problem or limitation in the associated sample results. The internal QC components of a sampling and analyses program will ensure that the data of known quality are produced and documented. The internal QC checks, frequency, acceptance criteria and corrective action required to meet project objectives are presented in the Laboratory Quality Assurance Manual included in Attachment H of this QAPP.

10.1 Analytical Laboratory QC Samples

Laboratory QC is necessary to control the analytical process within method and project specifications, and to assess the accuracy and precision of analytical results.

The laboratory will perform the following QC checks:

- Calibration standards
- Laboratory control samples
- Method blanks
- Matrix spike and matrix spike duplicates
- Surrogate spikes
- Laboratory duplicate samples, and
- Control standards

The procedures for analysis and review of these QC checks samples are described in the Laboratory Quality Assurance Manual.

10.2 Field QC Samples

Field QC samples are used to assess the influence of sampling procedures and equipment used in sampling. They are also used to characterize matrix heterogeneity.

The following field QC samples will be collected for this program:

- Field duplicate samples
- Equipment blanks and
- Field spikes

A summary of calibration and internal Quality Control Procedures for Pesticides is presented in laboratory Standard Operating Procedure. These SOP are presented in Appendix I of this QAPP.

11 AUDIT AND DATA VALIDATION

The laboratory chosen to conduct the analyses will be certified for wastewater analyses by the California Department of Health Services under its Environmental Laboratory Accreditation Program. It is assumed that under this accreditation program that the laboratory will be audited on a regular basis.

11.1 Technical System Audit

The laboratory system audit results are used to review operations and ensure that the technical and documentation procedures provide valid and defensible data.

Critical items for a laboratory system audit include:

- Sample storage procedures;
- Availability of and compliance with calibration procedures and documentation requirements;
- Standard operating procedures;
- Source and handling of standards;
- Completeness of data forms, notebooks and other records of analysis and QC activities;
- Data review and verification procedures;
- Data storage, filing and record keeping procedures;
- Sample custody procedures;
- Establishment and use of quality control procedures, control limits and corrective actions that comply with specification in this QAPP;
- Operating conditions of the facilities and the equipment;
- Documentation of the instruments' maintenance activities; and
- Laboratory staff training and documentation.

11.2 Performance Evaluation Audits

Performance evaluation audits quantitatively assess the data produced by a measurement system. Performing evaluation audit involves submitting certified samples for each analytical method. The matrix standards are selected to reflect the concentration range expected for the sampling program. The performance evaluation audit evaluates whether the measurement system is operating within the project control limit specified in this QAPP and the data produced meet the project and analytical quality control specifications.

Critical items for the performance evaluation audits are:

- Accurate identification of the analytes included in the PE samples
- Quantitation within acceptance limits
- Accurate reporting of results and any problems identified
- Acceptable analytical batch QC sample results

These items are used to identify when a system is outside acceptable control limits. Any problem associated with PE samples must be evaluated to determine the influence on field samples analyzed during the same time period. The laboratory must provide a written response to the District any PE sample result deficiencies.

11.3 Data Validation

Data validation (data quality audit) is conducted to verify whether an analytical method has been performed according to the method and project specifications, and the results have been correctly calculated and reported.

Specific items that are reviewed during data validation are:

- Chain of custody record
- Documentation of laboratory procedures (e.g., standard preparation records, run logs, data reduction and verification)
- Accuracy of data reduction, transcription, and reporting
- Adherence to method-specific calibration procedures and quality control parameters
- Precision and accuracy of recorded results

11.4 Field Technical Audits

The project managers routinely observe field operations to ensure consistency and compliance with sampling specifications presented in the QAPP. Audit checklists that will document field observations and activities will be completed. A copy of the field audit will be available in the project file. A copy of the Field Audit Checklist is included in Attachment J of this QAPP.

11.5 Split Samples

A second laboratory that meets the analytical requirements stated in this QAPP will be selected for performing the split samples. The District will arrange for the field team to ship samples to the designated laboratory. Chain of custody procedures must be followed at all times. A copy of the results of split samples will be included in the annual report.

12 PREVENTATIVE MAINTENANCE

A preventative maintenance program's primary objective is to assure the timely and effective completion of a measurement effort by minimizing the downtime of crucial sampling or analytical equipment from unexpected component failure. The program efforts are focused in the three principal areas: maintenance responsibilities, maintenance schedule, and inventory of critical spare parts and equipment.

The maintenance performed on the analytical instruments that are used for this project is described in the Laboratory Quality Assurance Manual.

13 DATA ASSESSMENT PROCEDURES

Measurement data must be consistently assessed and documented to determine whether project quality assurance objectives (QAOs) have been met, quantitatively assess data quality, and identify potential limitations on data use.

The laboratory is responsible for following the procedures and operating the analytical systems within the statistical control limits. These procedures include proper instrument maintenance, instrument calibration, and the laboratory QC sample analyses at the required frequencies (i.e., method blanks, laboratory control samples, etc.). Associated QC sample results are reported with all sample results so project staff can evaluate the analytical process performance.

All project data must be reviewed by the District as part of the data assessment. Review is conducted on a preparation batch basis by assessing QC samples and all associated field sample results.

Project data review established for this project includes the following steps:

- Initial review of analytical and field data for complete and accurate documentation, chain of custody procedures, analytical holding times compliance, and required frequency of field and laboratory QC samples;
- Evaluation of analytical and field blank results to identify random and systematic contamination;
- Comparison of all spike and duplicate results with project objectives for precision and accuracy;
- Assigning data qualifier flags to the data as necessary to reflect limitations identified by the process; and
- Calculating completeness by matrix and analyte.

The District staff conducting the data assessment is responsible for ensuring that data qualifier flags are assigned as needed, based on the established QC criteria. Staff is also

responsible for communicating any limitations to data users. A data review checklist will be completed upon completion of each laboratory package by District staff. Copy of the data review checklist is presented in Appendix K of this QAPP.

14 CORRECTIVE ACTION

During the course of sample collection and analysis in this study, the laboratory supervisors and analysts, field supervisors and team members will make sure that all measurements and procedures are followed as specified in this QAPP, and measurements meet the prescribed acceptance criteria.

Problems about analytical data quality that may require corrective action are documented on a corrective action form presented in the laboratory quality assurance manual.

Problems about field data quality that may require corrective action are documented in the field data sheets.

15 ANALYTICAL DATA AND QUALITY ASSURANCE REPORT

The District will prepare and submit a calendar year Annual Report to the SWRCB by January 31 of the following year. The Annual Report shall contain tabular summaries of the pesticide monitoring data obtained during the previous year. The Annual Report shall include a summary including but not limited to

- Objectives of the monitoring program.
- The monitoring results.
- Interpretation of the data in relation to frequency, duration and magnitude of impacts to beneficial uses.

16 SITE MANAGEMENT

The District field manager observes field activities to ensure tasks are conducted according to the project specifications. The field coordinator is equipped with a cellular telephone for improved communication among team members.

Decontamination of field equipment occurs at a designated area assigned by the field manager.

Herbicide Formulas and Application Concentrations

The following information provides details on how NID calculates herbicide application concentrations.

Magnacide H (Acrolein)

Magnacide H is applied through a closed system. Applications take place approximately every four weeks from April through October.
The following formula is used by NID to determine the appropriate concentration of Magnacide H to use and is based upon weed growth and water temperature.

Aquatic Vegetation Conditions and Associated Magnacide H Concentrations

Condition	Magnacide H Concentration
Minimal algae and pondweed less than 6 inches long	0.17 gal/cfs
Moderate algae and pondweed less than 12 inches long	0.25 gal/cfs
Algae (some floating) and pondweed 12-24 inches long	0.50 gal/cfs
Algae (some floating) and mature pondweed	1.0 gal/cfs
Choked conditions	1.5 gal/cfs

Based upon the water temperature at the time of application an increase in the affective concentration of Magnacide H may be necessary. The following table is used to determine if an increased concentration is necessary. A maximum of 15 ppm is never exceeded regardless of water temperature.

Increases in Magnacide H Concentration Relative to Water Temperature

Water Temperature	Increased Amount of Magnacide H added to original concentration
60-55°F	20%
55-50°F	50%
50°F or below	100%

NID consults a flow table and orifice chart to determine how long to apply the Magnacide (gal/hour) and the size of the application orifice to use. The concentration of Magnacide H is then determined with the following formula:

Dosage (gal/cfs) x 1884 / application time (minutes) = ppm of Magnacide H

The following shows an example of how NID calculates concentration and the necessary time of application.

Camp Far West Canal has a flow of 25 cfs with floating algae and pondweed 12-24 inches long, and a water temperature of 70°F. This situation would call for a desired concentration of 0.50 gal/cfs with no increase in concentration necessary due to water temperature.

1. Amount of Magnacide H applied: 25 cfs / 0/50 gal/cfs = 12.5 gal
2. Refer to flow chart to determine time of application. Flow chart indicates to apply Magnacide H for 2 hours. 12.5 gal / 2 hours = 6.25 gal/hour
3. To determine the appropriate nozzle size to use refer to orifice flow chart to determine number closest to 6.25 gal/hour. Chart indicates 6.2 gal/hour.
   6.2 gal/ hour = 15 psi at 0.035 orifice size
4. Calculate the concentration of Magnacide H being applied to waterbody.
   6.2 gal / 25 cfs = .248
   .248 x 1884 = 467.262
   467.262 / 60 minutes = 7.78 ppm

Glyphosate

Glyphosate applications are made with a hand held sprayers on vehicles or backpack type pumps. Applications of glyphosate to water are only conducted in moving water and are made while traveling upstream to prevent concentrated pulses of the herbicide in the water. A maximum of 7.5 pints per acre is applied, and must not be exceeded in any single broadcast made over water.

The potential for drift is lowest when applications are made when the wind speed is less than 10 mph but, is also dependent upon droplet size of application and equipment used. To minimize drift, NID will not conduct any glyphosate applications if the wind speed exceeds 5 mph. The wind speed at the site of application is determined with a hand-held wind meter.

Cutrine-Plus

Applications rates of Cutrine-Plus are determined by weed growth, and normally are applied at concentrations between 0.5 – 1.0 ppm. This concentration is calculated from the following formula:

1 quart of Cutrine-Plus/ cfs/ hour = 1 ppm

Example: Dudley Canal has a flow of 6 cfs which will require 6 gallons of Cutrine-Plus. A flow chart indicates to apply the herbicide for 4 hours.

6 gal / 4 hours = 1.5 gal / hour

To convert gallons to ounces:
1.5 gal x 128 = 192 oz
192 oz. / 60 minutes = 3.2 oz. per minute
3.2 oz. / minute = 1 ppm

Clearigate

Application of Clearigate is determined by weed growth, and is generally applied at a concentration of 1 ppm. A chart is referenced to determine the length of application.

2.8 ounces / cfs / hour = 1 ppm

For a four hour application: 4 hours = 2.8 gals / cfs

Example: Tunnel extension has a flow of 3 cfs.

3 cfs x 2.8 gal = 8.4 gal total
8.4 gal / 4 hours = 2.1 gal / hour

To convert gallons to ounces: 2.1 x 128 = 268.8 oz. / 60 minutes = 4.48 oz. / minute

LISTED AND SPECIAL-STATUS SPECIES POTENTIALLY OCCURRING WITHIN NEVADA, PLACER, AND YUBA COUNTIES

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Plants			
Ahart's (dwarf) rush *Juncus leiospermus var. ahartii*	FSC; --; --; 1B	Valley and foothill grassland (mesic); elevation 30-100 meters. Annual herb, blooms March-May.	Known from only 6 occurrences. Threatened by development.
Big-scale balsamroot *Balsamorhiza macrolepis var. macrolepis*	--; --; SLC; 1B	Chaparral, cismontane woodland, valley and foothill grassland/sometimes serpentinite; elevation 90-1400 meters. Perennial herb, blooms March-June.	
Boggs Lake hedge-hyssop *Gratiola heterosepala*	--; CE; --; 1B Critical Habitat Designated in Placer and Yuba County	Marshes and swamps (lake margins), vernal pools/clay; elevation 10-2375 meters. Annual herb, blooms April-August	Threatened by agriculture, development, grazing, trampling, and vehicles.
Brandegee's clarkia *Clarkia biloba ssp. brandegeae*	--; --; SLC; 1B	Chaparral, cismontane, woodland/often roadcuts; elevation 295-855 meters. Annual herb, blooms May-July	Threatened by road maintenance and fire suppression.
Butte's fritillary *Fritillaria eastwoodiae*	FSC; --; --; 3	Chaparral, cismontane woodland, lower montane coniferous forest (openings)/sometimes serpentinite; elevation 50-1500 meters. Perennial herb (bulbiferous), blooms March-May	
Cantelow's lewisia *Lewisia cantelowii*	FSC; --; --; 1B	Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest/mesic, granitic, sometimes serpentinite seeps; elevation 385-1370 meters. Perennial herb, blooms May-October.	Threatened by horticultural collecting and road maintenance.
Carson Range rock cress *Arabis rigidissima var. demota*	FSC; --; --; 1B	Broadleaved upland forest, upper montane coniferous forest/rocky; elevation 2255-2560. Perennial herb, blooms August.	Known in CA from only 2 occurrences near Martis Peak. Threatened by logging. Not in Jepson Manual.
Cedar crest allocarya *Plagiobothrys glyptocarpus var. modestus*	FSC; --; --; 3	Cismontane woodland; elevation 870 meters. Annual herb, blooms April-May.	Apparently not collected since 1937.

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Plants			
Closed-lip (close-throated) beardtongue *Penstemon personatus*	FSC; --; --; 1B	Chaparral, lower montane coniferous forest, upper montane coniferous forest/metavolcanic; elevation 1065-2120 meters. Perennial herb, blooms June-September	Threatened by logging activities.
Clustered lady's slipper *Cypripedium fasciculatum*	FSC; --; --; 4	Lower montane coniferous forest, North Coast coniferous forest/usually serpentinite seeps and streambanks; elevation 100-2435 meters. Perennial herb, blooms March-July.	
Common moonwort *Botrychium lunaria*	FSC; --; --; 2	Meadows and seeps, subalpine coniferous forest, upper montane coniferous forest; elevation 2280-3400 meters. Perennial herb (rhizomatous), fertile August.	
Donner Pass buckwheat *Eriogonum umbellatum var. torreyanum*	FSC; --; --; 1B	Meadows and seeps, upper montane coniferous forest/volcanic, rocky; elevation 1855-2620 meters. Perennial herb, blooms July-September	Known from fewer than 10 occurrences.
Felt-leaved (wooly) violet *Viola tomentosa*	--; --; SLC; 4	Lower montane coniferous forest, subalpine coniferous forest, upper montane coniferous forest/gravelly; elevation 1435-2000 meters. Perennial herb, blooms May-October.	Threatened by road building, vehicles, logging, and proposed reservoir construction in national forests.
Follett's monardella *Monardella follettii*	--; --; SLC; 1B	Lower montane coniferous forest (rocky, serpentinite); elevation 600-2000 meters. Shrub, blooms June-September.	Known from 8 occurrences. Threatened by mining and logging.
Hartweg's golden sunburst *Pseudobahia bahiifolia*	FE; CE; --; 1B	Cismontane woodland, valley and foothill grassland/clay; elevation 15-150 meters. Annual herb, blooms March-April	Extirpated from Yuba Cty; know for fewer than 20 occurrences
Hispid bird's beak *Cordylanthus mollis ssp. hispidus*	FSC; --; --; 1B	Meadows and seeps, playas, valley and foothill grassland/alkaline; elevation 1-155 meters. Annual herb (hemiparasitic), blooms June-September.	Apparently extirpated from much of the lower San Joaquin Valley. Threatened by agricultural conversion, development, and grazing.

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Plants			
Layne's butterweed (ragwort) *Senecio layneae*	FT; SR; --; 1B	Chaparral, cismontane woodland/serpentine or gabbroic, rocky; elevation 200-1000 meters. Perennial herb, blooms April-July	
Legenere *Legenere limosa*	FSC; --; --; 1B	Vernal pools; elevation 1-880 meters. Annual herb, blooms April-June.	Many historical occurrences extirpated. Threatened by grazing and development.
Lemmon's clover *Trifolium lemmonii*	--; --; SLC; 4	Great Basin scrub, lower montane coniferous forest; elevation 1500-1830 meters. Perennial herb, blooms May-July.	Threatened by development and agricultural conversion.
Long-petaled lewisia *Lewisia longipetala*	FSC; --; --; 1B	Alpine boulder and rock field, subalpine coniferous forest (mesic, rocky)/granitic; elevation 2500-2925 meters. Perennial herb, blooms July-August.	Known from fewer than twenty occurrences. Possibly threatened by horticultural collecting.
Plumas ivesia *Ivesia sericoleuca*	FSC; --; --; 1B	Great Basin scrub, lower montane coniferous forest, meadows and seeps, vernal pools/vernally mesic, usually volcanic; elevation 1465-2200 meters. Perennial herb, blooms May-September.	Threatened by development, grazing, and vehicles.
Quincy lupine *Lupinus dalesiae*	FSC; --; --; 1B	Chaparral, cismontane woodland, lower montane coniferous forest, upper montane coniferous forest/openings, often in disturbed areas; elevation 855-2500 meters. Perennial herb, blooms May-August.	Possibly threatened by logging ad roadside maintenance.
Red Hills soaproot *Chlorogalum grandiflorum*	FSC; --; --; 1B	Chaparral, cismontane woodland, lower montane coniferous forest/serpentinite or gabbroic; elevation 245-1005 meters. Perennial herb (bulbiferous), blooms May-June	Threatened by development, mining, and vehicles.
Saw-toothed lewisia *Lewisia serrata*	FSC; --; --; 1B	Broadleaved upland forest, lower montane coniferous forest, riparian scrub; elevation 900-1435. Perennial herb, blooms May-June.	Known from approximately 10 occurrences. Threatened by horticultural collecting and small hydroelectric power projects.

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Plants			
Scadden Flat checkermallow *Sidalcea stipularis*	--; CE; --; 1B	Marshes and swamps (montane freshwater); elevation 700-730 meters. Perennial herb (rhizomatous), blooms July-August.	Known from only 2 occurrences in Scadden Flat near Grass Valley. One occurrence voluntarily protected by landowner. Threatened by altered hydrology, grazing, and non-native plants.
Slender moonwort (narrowleaf grapefern) *Botrychium lineare*	FC;--; --; 1B	Upper montane coniferous forest; elevation 2600 meters. Perennial herb, unknown when fertile.	Known in California from only one small occurrence near Piute Pass. Not in the Jepson Manual.
Stebbin's morning-glory *Calystegia stebbinsii*	FE; CE; --; 1B	Chaparral (openings), cismontane woodland/serpentine or gabbroic; elevation 185-730 meters. Perennial herb (rhizomatous), blooms April-July	
Stebbin's phacelia *Phacelia stebbinsii*	FSC; --; --; 1B	Cismontane woodland, lower montane coniferous forest, meadow and seeps; elevation 610-2010 meters. Annual herb, blooms June-July	
Stinkbells *Fritillaria agrestis*	FSC; --; --; 4	Chaparral, cismontane woodland, pinyon and juniper woodland, valley and foothill grassland/clay, sometimes serpentinite; elevation 10-1555 meters. Perennial herb, blooms March-June.	Threatened by development.
Tahoe yellow-cress *Rorippa subumbellata*	FC; CE; --; 1B	Meadows and seeps, pinyon and juniper woodland, playas/mesic; elevation 1200-1800 meters. Perennial herb (rhizomatous), blooms May-September.	
Truckee barberry *Berberis sonnei*	FPD; --;--; --		Proposed for delisting

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Wildlife			
Invertebrates			
Amphibious caddisfly *Desmona bethula*	FSC; --; --;	Found in first-order streams in open, wet-meadow areas; occasionally found in beaver ponds on second-order streams. Larvae leave water at night to feed on riparian vegetation during the final instar. Major adult emergence in Sept-Oct.	
California linderiella fairy shrimp *Linderiella occidentalis*	FSC; --; --; -- Critical Habitat Designated in Placer and Yuba County	Inhabit clear to tea-colored water in seasonal pools ranging in size from square feet to many acres. These ponds are typically located in grasslands or in depressions of sedimentary rock. These ponds have also been characterized by a high pH.	Habitat loss is the main threat to this species. Urbanization, water supply/flood control activities, and the conversion of land to agricultural uses are the main human activities they contribute to their decline. Predators such as carnivorous insects and tadpole shrimp also play a role in their abundance.
Cold Spring caddisfly *Lepidostoma ermanae*	FSC; --; --; --;		
Lake Tahoe benthic stonefly *Capnia lacustra*	FSC; --; --; --	Benthic zone of Lake Tahoe	
Sacramento Valley tiger beetle *Cicindela hirticollis abrupta*	FSC; --; --; --		
Sagehan Creek goracean caddisfly *Goeracea oregona*	FSC; --; --; --	Rocky mountain streams; restricted to vicinity of Sagehen Creek.	
Shirttail Creek stonefly *Megaleuctra sierra*	FSC; --; --; --		
South Forks ground beetle *Nebria darlingtoni*	FSC; --; --; --	Riverine shoreline habitat associated with the south fork of the American River.	

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Wildlife			
Invertebrates			
Spiny rhyacophilan caddisfly *Rhyacophila spinata*	FSC; --; --; --	Mid to high elevation mountain streams.	
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT;--;--; --	Associated with its host plant, the elderberry (*Sambucus* sp.).	
Vernal pool fairy shrimp *Branchinecta lynchi*	FT; --; --; -- Critical Habitat Designated in Placer and Yuba County	Vernal pools, swales, and ephemeral freshwater habitat.	
Vernal pool tadpole shrimp *Lepidurus packardi*	FE; --; --; -- Critical Habitat Designated in Placer and Yuba County	Vernal pools, swales, and ephemeral freshwater habitat.	
Amphibians/Reptiles			
California horned lizard *Phrynosoma coronatum frontale*	FSC; CSC; --; --	These lizards may be found in open or scrub dry grasslands and in wooded grassland and riparian habitats with low rocks to serve as basking areas. These lizards have also been found in broadleaf woodland regions.	Sea level to 9500 feet
California red-legged frog *Rana aurara draytonii*	FT; CSC; --; --	Requires a permanent water source and is typically found along quiet slow moving streams, ponds, or marsh communities with emergent vegetation.	

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Wildlife			
Amphibians/Reptiles			
California tiger salamander *Ambystoma californiense*	FPT; CSC; --; --	Lowland species restricted to the grasslands and lowest foothill regions of Central and Northern California. Long-lasting rain pools are required breeding habitat. Squirrel and gopher burrows along with man made structures are popular sites used as burrows.	This unique California endemic is the most vulnerable of the group of amphibians that breed in rain pools. Loss of rain (vernal) pools, and the degradation of complexes of long-lasting pools that are critical breeding grounds are a significant threat to it survival. The presence of aquatic predators (frogs and fish) also contribute to their population losses.
Foothill yellow-legged frog *Rana boylii*	FSC; CSC; --; --	Requires shallow, flowing water of small-moderate sized streams with some cobble-sized substrate. They are infrequent or absent in habitats where introduced aquatic predators are present.	Have not been observed for 20 years in 19 historical localities of the west slope drainages of the Sierra Nevada and southern Cascade Mountains east of the Sacramento-San Joaquin River axis.
Giant garter snake *Thamnophis gigas*	FT; CT; --; --	Agricultural wetlands and other wetlands such as irrigation and drainage canals, low gradient streams, marshes, ponds, sloughs, small lakes, and their associated uplands.	
Mount Lyell salamander *Hydromantes platycephalus*	FCS; CSC; --; --	Restricted to alpine or subalpine vegetation associations. Extensive outcrops of rocks and boulders are characteristic of their habitat. Free surface water is almost always present within a few meters of where it is found.	Very patchy distribution may be especially susceptible to local extirpation events. More information on its microhabitat requirements are needed.
Mountain yellow-legged frog *Rana muscosa*	FE; CSC;--;--	Inhabits ponds, tarns, lakes, and streams at moderate to high elevations. Seems most successful where predatory fish are absent.	Introduced fishes have apparently eliminated it from many lakes and streams.

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Wildlife			
Amphibians/Reptiles			
Northwestern pond turtle *Clemmys marmorata marmorata*	FSC; CSC; --; --	Permanent ponds and streams or nearly permanent in a wide variety of habitats including valleys, foothills and montane regions	
Southwestern pond turtle *Clemmys marmorata pallida*	FSC; CSC; --; --	Inhabits valley locations with slow-moving waterways. Upland habitat and basking sites must be easily accessible. Mostly aquatic they move to upland areas for egg laying. They over winter in underground burrows in upland habitats.	Man has precipitated their decline due to disturbance of upland nesting habitat, over harvesting (by the now banned terrapin soup industry), by agriculture, livestock grazing, and development.
Western spadefoot toad *Spea hammondii*	FSC; CSC; --; --	Require temporary rainpools with water temperatures of $\geq$ 9°C and < 30°C in which to reproduce and that last $\geq$ 3 weeks in order to metamorphose successfully.	Loss and fragmentation of habitat, and the placement of mosquito fish in vernal pools by mosquito abatement programs contribute to their decline.
Fish			
Central Valley spring-run Chinook salmon *Oncorhynchus tshawytscha*	FT; CT; --; --	Rivers, streams, and tributaries to the Sacramento River Basin. Adults depend on pool depth and volume, vegetation cover, and gravel substrate for reproduction. Sustained water temperatures above 27°C are lethal to adults. Spawning occurs in gravel beds.	Historic population declines are attributable mainly to loss of upstream habitat and secondarily to harvest. Critical habitat has been designated for this species.
Central Valley fall/late fall-run Chinook salmon *Oncorhynchus tshawytscha*	FC; CSC; --; -- Critical Habitat Designated in Yuba County	Spawning and rearing occur in the Sacramento River Basin, and migration occurs through the San Francisco Bay-Delta. They require gravel beds and cold, clean water for spawning.	Causes of population decline are poorly understood, but are presumably due to passage problems over dams, loss of habitat, introgression with other runs, and diseases and pollutants.
Central Valley steelhead *Oncorhynchus mykiss*	FT; --; --; --	Spawn in the Sacramento and San Joaquin rivers, streams, and tributaries, and migrate through the San Francisco Bay-Delta region.	

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Wildlife			
Fish			
Delta smelt *Hypomesus transpacificus*	FT; CT; --; --	Rivers, streams, and tributaries to the Sacramento –San Joaquin river basins, and the San Francisco Bay-Delta.	
Green sturgeon *Acipenser medirostris*	FC; CSC; --; --	Habitat requirements are poorly known, but probably require cold, clean water for spawning. Preferred substrate likely is large cobble, but can range from bedrock to clean sand.	Spawning populations are known only in the Klamath and Sacramento rivers, and indirect evidence of spawning is reported for the Feather River. They have always been comparatively uncommon. Major factors affecting their abundance are fisheries, modification of spawning habitat, entrainment, and toxic substances.
Lahonton cutthroat trout *Oncorhynchus clarki henshawi*	FT; --; --; --	Streams and lakes on the eastern slope of the Sierra Nevada	
River Lamprey *Lampetra ayresi*	FSC; CSC; --; --	Migrates upstream in late spring and summer to spawn in fine gravel beds.	Most numerous in the Sacramento and San Joaquin rivers
Pacific Lamprey *Lampetra tridentata*	FSC; --; --; --	Migrates upstream in late spring and summer to spawn in fine gravel beds.	
Sacramento splittail *Pogonichthys macrolepidotus*	FT; CSC; --; --	Backwater slough areas of the San Francisco Delta and Sacramento and San Joaquin rivers. Spawns over shoreline vegetation or gravel in creek tributaries of large rivers during spring high water levels.	The deep channelization of the San Francisco Delta has destroyed much of their potential spawning area and has been partially responsible for the decline of the species.
Birds			
Aleutian Canada goose *Branta canadensis leucopareia*	FD; --; --; --	Main wintering ground is in California's Central Valley agricultural lands. Feeds mainly on green shoots and seeds of cultivated grains and wild grasses and wild grasses and forbs, by grazing and gleaning in most fields. Also feeds on aquatic plants, sometimes by tipping. Regularly seeks grit.	

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Birds			
American bittern *Botaurus lentiginosus*	FSC; --; --; --	Resident of freshwater emergent wetlands.	
American dipper *Cinclus mexicamus*	--; --; SLC; --	Confined to clear, fast flowing streams and rivers with rocky shores and bottoms in montane regions but may move to lower elevations in winter.	
American peregrine falcon *Falco peregrinus anatum*	FD; CE; --; -- DFG: Fully protected	Nests on high cliffs, banks, dunes, or mounds in woodland, forest, and coastal habitats near permanent water sources.	
Bald Eagle *Haliaeetus leucocephalus*	FT (FPD); CE (Fully Protected); -- (Nesting and Wintering)	Nesting restricted to the mountainous habitats near permanent water sources. Winters throughout most of California at lakes, reservoirs, river systems, and coastal wetlands.	
Bank swallow *Riparia riparia*	FSC; CT; --; -- (Nesting)	Restricted to riparian areas with vertical cliffs and banks with fine-textured or sandy soils while breeding.	
Black swift *Cypseloides niger*	FSC; CSC; --; -- (Nesting)	Nests in moist crevices or caves or cliffs behind or adjacent to waterfalls in deep canyons.	
California spotted owl *Strix occidentalis occidentalis*	FSC; CSC; --; --	Occurs in mature, dense, multilayered evergreen forest with large trees and open areas under the canopy in mixed conifer, redwood and Douglas fir forests.	
California thrasher *Toxostoma redivivum*	FSC; --; --; --	Resident of foothills and lowlands in cismontane regions such as chaparral and young or open valley foothill riparian habitats.	
Ferruginous hawk *Buteo regalis*	FSC; CSC; --; --	A winter resident of open habitats in California including grasslands, and brushy forests.	

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Birds			
Flammulated owl *Otus flammeolus*	FSC; --; --; --	Variety of coniferous habitats from montane forests to subalpine and red fir conifer forests, and favors small openings, edges and clearings with snags for nesting and roosting.	
Greater sandhill crane *Grus canadensis tabida*	--: CT; --; -- (Nesting and Wintering) DFG: Fully protected	Nests in wet meadows interspersed with emergent marsh habitat. Winters in agricultural croplands and irrigated pastures.	
Harlequin duck *Histrionicus histrionicus*	FSC; CSC; --; -- (Nesting)	Nests near turbulent mountain streams or in holes in trees or cliffs. Winters near rough coastal water.	
Lawrence's goldfinch *Carduelis lawrencei*	FSC; --; --; --	Nests in open oak or other arid woodland and chaparral habitats near water.	
Lewis' woodpecker *Melanerpes lewis*	FSC; --; --; --	Found in open, deciduous and conifer habitats with brushy understory, and scattered snags and live trees for nesting and perching.	
Little willow flycatcher *Empidonax traillii brewsteri*	FSC; --; --; -- (Nesting)	Nests in shrubby riparian vegetation with some surface water or saturated soil conditions.	
Loggerhead shrike *Lanius ludovicianus*	FSC; CSC; --; --	Inhabits open areas with scattered shrubs, trees, posts, fences, utility lines, or other perches.	
Long-billed curlew *Numenius americanus*	FSC; CSC; --; --	Found in the high plains and rangelands. Winters on cultivated lands, tideflats, beaches and salt marshes. In California, nests on elevated interior grasslands and wet meadows, usually adjacent to lakes or marshes.	
Mountain plover *Charadrius montanus*	FPT; CSC; --; --	Frequents open plains with low, herbaceous or scattered shrub vegetation.	Does not nest in California, winters in northern California and other locations.

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Birds			
Northern goshawk *Accipiter gentiles*	FSC; CSC; --; -- (Nesting)	Frequents middle to higher elevations and mature dense conifer forests. Nests typically found in dense stands of large pones, on north facing slopes near a water source.	
Nutall's woodpecker *Picoides nuttallii*	--; --; SLC; --	Permanent resident of low-elevation riparian deciduous and oak habitats.	
Oak titmouse *Baeolophus inornatus*	--; --; SLC; --	Oak and pine-oak woodland, chaparral, and oak-riparian habitats.	
Olive-sided flycatcher *Contopus cooperi*	FSC; --; --; --	Summer resident in a wide variety of forest and woodland habitats. Nesting habitats include, mixed conifer, montane hardwood-conifer, Douglas fir, redwood, red fir and lodgepole pine.	
Red-breasted sapsucker *Sphyrapicus ruber*	FSC; --; --; -- (Nesting)	Yearlong resident in open wood and mountainous areas. Nesting habitat includes montane riparian, aspen, montane hardwood-conifer, mixed conifer, and red fir, often near meadows, clearings, lakes and slow-moving streams.	
Rufous hummingbird *Selasphorus rufus*	FSC; --; --; --	Inhabits hardwood, hardwood-conifer, meadows, riparian, and chaparral habitats. Nests in open cup, usually sloping branch near the ground.	
Sage grouse *Centrocerius urophasianus*	FSC; CSC; --; -- (Nesting and Leks)	Found in greatest abundance in a combination of sagebrush, perennial grassland or wet meadow, and water. Highly dependent upon meadows for green forbs and insects in summer.	Uncommon permanent resident of northeastern California. Habitat loss and over-grazing have declined their numbers in recent decades. Herbicide sprayings in the vicinity of strutting areas is detrimental.

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Birds			
Swainson's hawk *Buteo swainsoni*	FSC; CT; --; -- (Nesting)	Nests in isolated trees or riparian woodlands adjacent to suitable foraging habitat (agricultural fields, grasslands, etc.).	
Tricolored blackbird *Agelaius tricolor*	FSC; CSC; --; --	Nests in dense blackberry, cattail, tules, willow, or wild rose within emergent wetlands throughout the Central Valley and foothills surrounding the valley.	
Vaux's swift *Chaetura vauxi*	FSC; CSC; --; -- (Nesting)	Nests within large hollow trees and snags in conifer habitats.	
Western burrowing owl *Athene cunicularia hypugaea*	FSC; CSC; --; --	Nests in burrows in the ground, often in old ground squirrel burrows or badger, within open dry grassland and desert habitat.	
Western yellow-billed cuckoo *Coccyzus americanus occidentalis*	FC; CE; --; -- (Nesting)	Nesting restricted to river bottoms and other mesic habitats where humidity is high.	
White-faced ibis *Plegadis chihi*	FSC; CSC; --; -- (Rookery site)	Nests in dense, fresh emergent wetlands.	
White-headed woodpecker *Picoides albolarvatus*	FSC; --; --; --	Yearlong resident of montane coniferous habitats near natural openings or along the edges of clearings or roads.	
Mammals			
American (=pine) marten *Martes americana*	FSC; --; --; --	Optimal habitats are various mixed evergreen forests with more than 40% crown closure, with large trees and snags. Important habitats include red fir, lodgepole pine, subalpine conifer, mixed conifer, Jeffrey pine, and eastside pine.	Permanent resident of Sierra Nevada. Large clearcuts, extensive even-aged forest management, and destruction of mature stands are detrimental to these mustelids.

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Mammals			
California wolverine *Gulo gulo luteus*	FSC; --; --; -- DFG: Fully protected	In the northern Sierra Nevada, it has been found in mixed conifer, red fir, and lodgepole habitats, and probably uses subalpine conifer, alpine dwarf-shrub, wet meadow, and montane riparian habitat. (Elevation 4300-7300 feet)	A scarce resident of Sierra Nevada and probably never common in California. Trapping, human disturbance, and grazing of high Sierra Nevada meadows have contributed to decline, a trend which may now be reversing.
Fisher *Martes pennanti*	FSC; --; --; --	Occurs in intermediate to large-tree stages of coniferous forests and deciduous-riparian habitats with a high percent canopy closure.	Uncommon permanent resident of the Sierra Nevada, and other areas.
Fringed myotis bat *Myotis thysanodes*	FSC; --; --; --	Various habitats such as valley foothill hardwoods, and hardwood-conifer habitats, roosting in caves, mines, buildings, and crevices.	
Greater western mastiff-bat *Eumops perotis californicus*	FSC; --; --; --	Inhabits open areas in annual and perennial grasslands, coniferous and deciduous woodlands, with potential roost locations having vertical faces to drop off from and take flight, such as crevices in rock outcrops and cliff faces, tunnels and tall buildings.	
Long-eared myotis bat *Myotis evotis*	FSC; --; --; --	Resides in various habitats such as brush, woodland and conifer forest, roosting on buildings, in crevices, spaces under bark, and snags.	
Long-legged myotis bat *Myotis volans*	FSC; --; --; --	Woodland and forest communities above approximately 4,000 feet above MSL. Roosts in rock crevices, buildings, under tree bark, in snags, mines, and caves.	**No**; there is no potential habitat for this species on the site.
Marysville Heerman's kangaroo rat *Dipodomys californicus eximius*	FSC; CSC; --; --	Annual grasslands, mixed montane chaparral, young valley foothill hardwood, and valley foothill hardwood-conifer habitats.	

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Mammals			
Pacific western big-eared bat *Corynorhinus (=Plecotus) townsendii townsendii*	FSC; CSC; --; -- DFG: full species	Found at elevations ranging from sea level to 3,500 feet and is dependent on cliffs, caves, and old mines for roosting, nursery, and hibernation sites.	
Pale Townsend's big-eared bat *Corynorhinus (=Plecotus) townsendii pallescens*	FSC; CSC; --; -- DFG: full species	Prefers mesic habitats and requires caves, mines, tunnels, buildings, or other human-made structures for roosting.	
San Joaquin pocket mouse *Perognathus inornatus*	FSC; --; --; --	Annual grassland and scrub habitats with fine-textured soil conditions.	
Sierra Nevada red fox *Vulpes vulpes necator*	FSC; CT; --; --	Found in a variety of habitats in the Sierra Nevada, including alpline dwarf-shrub, wet meadow, subalpine conifer, lodgepole pine, red fir, aspen, montane chaparral, montane riparian, mixed conifer, and ponderosa pine. Jeffrey pine, eastside pine, and montane hardwood-conifer are also used.	Sierra Nevada red foxes are rare, and numbers may be continuing to decline.
Sierra Nevada snowshoe hare *Lepus americanus tahoensis*	FSC; CSC; --; --	Occur in young growth mixed conifer, subalpine conifer, red fir, Jeffrey pine, lodgepole pine, and often utilizes habitats with dense understory along forest edges near meadows.	
Small-footed myotis bat *Myotis ciliolabrum*	FSC; --; --; --	Occurs in a wide variety of habitats, primarily in relatively arid wooded and brushy uplands near water, roosting in caves, buildings, mines and crevices.	
Spotted bat *Euderma maculatum*	FSC; CSC; --; --	Habitats occupied range from grasslands through mixed coniferous forests. Roost mainly in rock crevices but occasionally is found in caves and buildings.	

Common Name	Regulatory Status (Federal; State; Local; CNPS)	Habitat Requirements	Potential for Occurrence
Mammals			
Yuma myotis bat *Myotis yumanensis*	FSC; --; --; --	Reside in open forests and woodland habitats with sources of water over which to feed. Roost in buildings, mines, caves, and crevices	**No**; there is no potential habitat for this species on the site.

Federally Listed Species:

FE = federal endangered

FT = federal threatened

FSC = federal species of concern

FC = candidate

PT = proposed threatened

FPD = proposed for delisting

FD = delisted

California State Listed Species:

CE = California state endangered

CT = California state threatened

CR = California state rare

CSC = California Species of Special Concern

CNPS* List Categories:

1A = plants presumed extinct in California

1B = plants rare, threatened, or endangered in California and elsewhere

2 = plants rare, threatened, or endangered in California, but common elsewhere

3 = plants about which we need more information

4 = plants of limited distribution

Other Special-status Listing:

SLC = species of local or regional concern or conservation significance

Source: Foothill Associates

Clearigate

EPA Reg. No. 8959-51 Pat. # 5,407,899 EPA Est. No. 42291-GA-1

**FOR USE IN CROP AND NON-CROP IRRIGATION CONVEYANCE SYSTEMS:
DITCHES, CANALS AND LATERALS;
POTABLE WATER RESERVOIRS; LAKES;
FARM, FISH, GOLF COURSE, INDUSTRIAL AND SWIMMING PONDS**

ACTIVE INGREDIENTS	
COPPER AS ELEMENTAL	3.825%*
INERT INGREDIENTS	96.175%
TOTAL	100.00%

* From Mixed Copper Ethanolamines in an Emulsified Formulation
CLEARIGATE CONTAINS 0.31 LBS. OF COPPER PER GALLON

-STOP-

READ THE LABEL BEFORE USE

DANGER

KEEP OUT OF REACH OF CHILDREN

STATEMENT OF PRACTICAL TREATMENT FIRST AID: IF IN EYES: Hold eyelids open and flush with a steady, gentle stream of water for 15 minutes. Get medical attention. IF ON SKIN: Wash with plenty of soap and water. Get medical attention. IF SWALLOWED: Call a doctor or get medical attention. Drink promptly a large quantity of milk, egg white, gelatin solution, or, if these are not available, large quantities of water. Avoid alcohol. IF INHALED: Remove to fresh air. If not breathing, give artificial respiration, preferably mouth-to-mouth. Get medical attention.

NOTE TO PHYSICIAN: Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock as well as oxygen and measures to support breathing manually or mechanically may be needed. If persistent, convulsions may be controlled by the cautious intravenous injection of a short-acting barbiturate drug.

NET CONTENTS

390476 275 Gallon Returnable

applied biochemists

division of Laporte Water Technologies , Inc.
MILWAUKEE, WI 53022
1-800-558-5106

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

CORROSIVE, causes skin burns and irreversible eye damage. May be fatal if absorbed through skin. Harmful if swallowed or inhaled. Do not get in eyes, on skin, or on clothing. Wear protective clothing, protective eyewear, and rubber gloves. Avoid breathing dust or spray mist. Wash thoroughly with soap and water after handling and before eating, drinking, or using tobacco. Remove contaminated clothing and wash before reuse.

ENVIRONMENTAL HAZARDS
Fish toxicity is dependent upon hardness of water. May be toxic to trout and other species of fish in soft water. Do not use in waters containing trout, koi, goldfish or other sensitive species if the carbonate hardness of the water is less than 50 ppm.

Avoid contact with drift to desirable plants or crops as injury may result. Clean out application equipment after each operation. Do not apply under conditions of high wind or wave action.

Treatment of dense weed growth and algae blooms in static ponds and lakes can result in oxygen loss from decomposition of dead vegetation. This loss can cause fish suffocation. Therefore, treat only 1/3 to 1/2 of the dense growth at a time and wait one to two weeks between treatments.

Some states may require permits for application of this product to public water. Check with local authorities.

PHYSICAL/CHEMICAL HAZARDS
Do not use or store near heat or open flame.

STORAGE AND DISPOSAL

PROHIBITIONS: Do not contaminate water, food or feed by storage or disposal.

STORAGE: Keep pesticide in original container. Do not store in a manner where cross-contamination with other pesticides, fertilizers, food or feed could occur. Store at temperatures above 32°F(0°C) away from heat or flame.

In the event of spillage during handling or storage, absorb with sand, clay or other inert material and dispose of absorbent in accordance with the pesticide disposal instructions listed below. For help with spill, leak, fire or exposure involving this material, call Chemtrec (1-800-424-9300).

PESTICIDE DISPOSAL: This product is acutely hazardous. Improper disposal of excess pesticide spray mixture or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste Representative at the nearest EPA Regional Office for guidance.

CONTAINER DISPOSAL: Triple rinse (or equivalent). Do not reuse container. Incinerate, burn or puncture and dispose of in a sanitary landfill, or dispose of by other procedures allowed by State and local authorities. If burned, stay out of smoke.

DIRECTIONS FOR USE:

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
READ ENTIRE LABEL. USE STRICTLY IN ACCORDANCE WITH PRECAUTIONARY STATEMENTS AND DIRECTIONS AND WITH APPLICABLE STATE AND FEDERAL REGULATIONS.

GENERAL GUIDELINES:
CLEARIGATE is a chelated copper formulation containing an emulsified surfactant/penetrant for highly effective control of coarse (thick cell-walled) filamentous algae, muscilaginous (colonial) planktonic algae, Chara and a variety of emergent, floating and submerged, aquatic plants. Vegetation controlled includes: Cladophora, Pithophora, Lyngbya, Microcystis, Hydrilla, pondweeds, water milfoil, naiad and other species having a sensitivity to copper absorption in conjunction with a penetrant.

FOR OPTIMUM EFFECTIVENESS:
Apply **CLEARIGATE** early in the day under bright or sunny conditions when water temperatures are at least 60°F (15.5°C).
Apply when growth first begins to appear or create a nuisance.
Apply in a manner which will ensure even distribution of product within treatment area.
Repeat application, as needed, if regrowth begins to appear and seasonal control is desired. Allow one to two weeks between consecutive treatments.

STATIC WATER TREATMENT
SURFACE SPRAY/INJECTION APPLICATION

For effective control, proper chemical concentration contact should be maintained for a minimum of three hours. Application rates in the chart below are based upon static or minimum flow situations in lakes, ponds, reservoirs and inactive irrigation conveyance systems or drainage systems. Where significant inflow occurs (greater than 10% of total water volume in 24 hours), it is recommended that flow be stopped for 24 hours during and following treatment. If this is not possible, treat inflowing water in accordance with Flowing Water Treatment instructions.

AQUATIC VEGETATION TYPE OR SPECIES	DOSAGE RATES PPM COPPER	 GALLONS PER ACRE FOOT	DILUTION % SPRAY SOLUTION V/V	TREATMENT COMMENTS
ALGAE				
Planktonic	0.1 - 0.5	0.9 - 4.4	1.5% - 5%	Apply lower dosage rates on light infestations. Use higher rates on heavy blooms and where algae masses are clumped and accumulated.
Filamentous	0.2 - 0.6	1.8 - 5.3	5% - 10%	Apply lower dosage rate on early season, light infestations or treatment of regrowth. Apply higher rates on surface mats and coarse species such as Pithophora, Cladophora, & Lyngbya.
Chara/Nitella	0.4 - 0.8	3.6 - 7.1	10% - 15%	Apply lower dosage on new infestations or early season growth. Apply higher rates on older, established calcified plants. Apply as close to top of plant growth as possible.
SUBMERSED PLANTS				
Egeria densa (Brazilian Elodea)	0.6 - 1.0	5.4 - 8.7	10% - 20%	Apply lower dose on early season, low density growth.
Elodea canadensis	0.8 - 1.0	7.1 - 8.7	10% - 20%	
Hydrilla verticillata	0.4 - 1.0	3.6 - 8.7	10% - 20%	Apply higher rates in thicker stands of plants.
Myriophyllum spp. (Water Milfoil)	0.8 - 1.0	7.1 - 8.7	10% - 20%	Product should be applied as close to the top of plants as possible.
Najas spp. (Naiad)	0.5 - 1.0	4.4 - 8.7	10% - 20%	
Potamogeton spp. (Pondweeds)	0.5 - 1.0	4.4 - 8.7	10% - 20%	Underwater injection is recommended when plants are more than one foot below water surface.
FLOATING PLANTS		GALLONS PER SURFACE ACRE		
Lemna spp. (Duckweed)	–	4.4 - 8.7	20% - 25%	Apply lower rates to shallow (less than 1 ft.) infestations. Use higher rates for large infestations in deeper water (1 ft. or greater) use a fine spray and wet plants thoroughly.
Eichornia crassipes (Water Hyacinth)	–	4.4 - 8.7	20% - 25%	Do not disturb with motor wake or paddles after treatment.

Select dosage rate based upon species/type of plants being controlled. Choose a dilution which will allow relatively even application throughout the intended treatment area with the type of equipment being used. Avoid drift by using coarse spray droplets, applying close to the water surface and/or injecting solution below the water surface through submersed hoses for treatment of submerged growth.

FLOWING WATER TREATMENT
DRIP SYSTEM/METERING PUMP APPLICATION

Effective aquatic plant control in flowing water (canals, ditches, laterals, etc.) is dependent upon maintaining suitable contact time with sufficient chemical concentrations. Other factors to consider include: type of growth present, degree of infestation, water temperature and weather conditions during and following treatment.

1. Prior to treatment, it is important to accurately determine water flow rates. In the absence of weirs, orifices or similar devices which provide accurate water flow measurements, volume of flow may be estimated via the following formula:

   Average Width (ft.) x Average Depth (ft) x Velocity*(ft/sec) x 0.9 = Cubic Feet per Second (CFS)

   * Velocity is the time it takes a floating object to travel a given distance. Dividing the distance traveled (ft) by the time (seconds) will yield velocity (ft/sec). Repeat measurement at least 3 times at the intended application site and use the average of these measurements.

2. Calculate volume of ditch, canal, lateral or receiving pond in cubic feet based upon water levels at the time of treatment by using the following formula
   Length (ft) x Average width (ft) x Average depth (ft) = Cubic Feet of Water

3. Calculate turnover time (the amount of time it takes for the water in the system to be replaced by new water). Convert to hours using the following formula:

$$\frac{\text{Canal Volume (ft}^3\text{)}}{\text{Flow Rate (CFS)}} + 3600 = \textbf{Turnover Time (hrs.)}$$

4. Select dosage rate from the chart below and calculate total **Clearigate** requirements by using the formula following the chart.

AQUATIC VEGETATION	PPM	DOSAGE RATE
PLANKTONIC ALGAE	0.1 - 0.5	0.3 - 1.4
FILAMENTOUS ALGAE	0.2 - 0.6	0.6 - 1.7
CHARA/NITELLA	0.4 - 0.8	1.2 - 2.3
SUBMERGED WEEDS	0.5 - 1.0	1.4 - 2.8

* **NOTE:** Use higher dosage range in cooler water (60°F - 70°F), under conditions of heavy growth and/or on matured plant growth. Lower dosage ranges may be used on maintenance control treatments, young plants and/or under minimal growth conditions in warmer waters (> 70°F).

Clearigate Required (qts) = Dosage Rate (qt/CFS/hr) x Flow Rate (CFS) x Turnover Time (hrs)*

*** NOTE: If turnover time is less than 3 hrs., substitute 3 hrs. into this calculation.**

5. For ditches, canals and laterals determine the number of drip/metering application sites required (based upon turnover time) by referring to the chart below:

TURNOVER TIME (Hrs)	NUMBER OF DRIP/METERING SITES
Less than 4.5	1
4.6 - 7.5	2
7.6 - 10.5	3
10.6 - 13.5	4
13.6 - 16.5	5
Etc.	

Sewage treatment ponds and other sites where water is stored for a calculated retention time and are fed by a single input source will require a single dripper/metering system. Inflowing water should be treated at the appropriate dosage rate from the chart in #4 for the duration of the entire turnover time calculated in #3.

6. Calculate distance between drip/metering sites by using the following formula:

$$\frac{\text{Canal/Ditch/Lateral Length (ft)}}{\text{No. of Drip/Metering Sites}} = \text{Distance Between Drip/Metering Systems (ft)}$$

7. Calculate amount of **CLEARIGATE** required per drip/metering site by using the following formula:

$$\frac{\text{Total CLEARIGATE Required (qts)}}{\text{No. of Drip/Metering Sites}} = \textbf{CLEARIGATE} \text{ Required Per Site (qts.)}$$

8. Calculate drip/metering duration per site by using the following formula:

$$\frac{\text{CLEARIGATE Required Per Site (qts)}}{\text{Dosage Rate (qt/CFS/hr) x Flow Rate (CFS)}} = \text{Drip/Metering Duration (hrs) Per Site}$$

9. Calculate Drip/Metering Rate by using the following formula to convert to oz./min. or ml/min.

Flow Rate (CFS) x Drip Rate (qt/CFS/hr) x 0.533 * = Drip Rate (oz/min)

* **NOTE:** 0.533 is a constant used to convert qt/hr to oz/min.

METRIC CONVERSION: Drip Rate (oz/min) x 29.57 = Drip Rate (ml/min)

Calibrate drip system, metering pump or similar dosage device to establish output rate determined in Step No. 9. This can be done using a watch with a second hand and a calibrated measuring cup, graduated cylinder or similar vessel.

If possible, calibrate all drip/metering devices prior to beginning actual treatment. Turn them on as simultaneously as possible, beginning with the device furthest upstream.

Begin with only the amount of product required at each site or record your start-up time and shut down drip/metering systems after the drip/metering duration time period determined in Step No. 8.

Remove containers from application sites following treatment. Triple rinse application equipment. Dispose of empty containers in accordance with container disposal instructions on this label. Partially used containers should be resealed with original closures and stored in accordance with storage instructions on this label.

CUTRINE®-PLUS

ALGAECIDE/HERBICIDE

Pat. No. 3,930,834 E.P.A. Reg. No. 8959-10 E.P.A. Est. No. 42291-GA-1

FOR USE IN LAKES - POTABLE WATER RESERVOIRS FARMS, FISH AND INDUSTRIAL PONDS, FISH HATCHERIES AND RACEWAYS, CROP AND NON-CROP IRRIGATION CONVEYANCE SYSTEMS, DITCHES, CANALS AND LATERALS

ACTIVE INGREDIENTS:	
COPPER AS ELEMENTAL	*9.0%
INERT INGREDIENTS	91.0%
TOTAL	100.0%

CUTRINE®PLUS contains 0.909 lbs. of elemental copper per gallon.
*From mixed Copper-Ethanolamine complexes

KEEP OUT OF REACH OF CHILDREN
DANGER

STATEMENT OF PRACTICAL TREATMENT
FIRST AID

If in eyes:	Call a physician. Hold eyelids open and flush with a steady gentle stream of water for 15 minutes.
If on skin:	Wash with plenty of soap and water. Get medical attention.
If swallowed:	Drink promptly a large quantity of milk, egg white, gelatin solution, or, if these are not available, large quantities of water. Avoid alcohol. Get medical attention. Do not induce vomiting or give anything by mouth to an unconscious person.

Note to Physician: Probable mucosal damage may contraindicate the use of gastric lavage.

(See Additional Precautions on Back Panel)

FIVE GALLONS (18.92 Liters)

MANUFACTURED BY:

ab applied biochemists
MILWAUKEE, WISCONSIN 53022
1-800-558-5106

GENERAL INFORMATION

CUTRINE®-PLUS under field conditions, is effective in controlling a broad range of algae including Chara, Spirogyra, Cladophora, Vaucheria, Ulothrix, Microcystis and Oscillatoria. **CUTRINE- PLUS** has also been proven effective in controlling the rooted aquatic plant, Hydrilla verticillata. The ethanolamines in **CUTRINE-PLUS** prevent the precipitation of copper with carbonates and bicarbonates in the water. Waters treated with **CUTRINE-PLUS** may be used for swimming, fishing, drinking, livestock watering or irrigating turf, ornamental plants or crops immediately after treatment.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.

SURFACE SPRAY/INJECTION

ALGAECIDE APPLICATION

For effective control, proper chemical concentration should be maintained for a minimum of three hours contact time. The application rates in the chart are based on static or minimal flow situations. Where significant dilution or loss of water from unregulated inflows or outflows occur (raceways) within a three hour period, chemical may have to be metered in.

- Identify the algae growth present as one of the following types: Planktonic (suspended), Filamentous (mat-forming), or Chara/Nitella.
- Determine the surface acreage (1 acre = 43,560 sq. ft.) and average depth of infested areas.
- Refer to the chart below to determine gallons of **CUTRINE-PLUS** to apply per surface acre.

Application Rates
Gallons Per Surface Acre

ALGAE TYPE	PPM COPPER	DEPTH IN FEET 1	2	3	4
Planktonic	0.2	0.6	1.2	1.8	2.4
Filamentous	0.2	0.6	1.2	1.8	2.4
Chara/Nitella	0.4	1.2	2.4	3.6	4.8

- For planktonic (suspended) algae and free-floating filamentous algae mats, application rates should be based upon treating only the upper 3 to 4 feet of water where algae is growing. Under conditions of heavy infestation treat only ⅓ to ½ of the water body at a time to avoid fish suffocation caused by oxygen depletion from decaying algae.
- Before applying dilute the required amount of **CUTRINE-PLUS** with enough water to ensure even distribution with the type of equipment being used. For most effective results, apply under calm and sunny conditions when water temperature is at least 60°F. Break up floating algae mats before spraying or while application is being made. Use hand or power sprayer adjusted to rain-sized droplets. Spray shoreline areas first to avoid trapping fish.

CUTRINE-PLUS Granular Algaecide may be used as an alternative in low volume flow situations, spot treatments or treatment of bottom-growing algae in deep water.

HERBICIDE APPLICATION: (For Hydrilla Control)
CUTRINE®-PLUS:
Control of Hydrilla verticillata can be obtained from copper concentrations of 0.4 to 1.0 ppm resulting from **CUTRINE-PLUS** treatment. Choose the application rate based upon stage and density of Hydrilla growth and respective water depth from the chart below.

Application Rates
Gallons/Surface Acre*

Growth/Stage Relative Density	PPM Copper	DEPTH IN FEET 1	2	3	4	5	6
Early Season/ Low Density	0.4	1.2	2.4	3.6	4.8	6.0	7.2
	0.5	1.5	3.0	4.5	6.0	7.5	9.0
	--0.6--	--1.8--	--3.6--	--5.4--	--7.2--	--9.0--	--10.8--
Mid-Season/ Moderate Density	0.7	2.1	4.2	6.3	8.4	10.5	12.6
	--0.8--	--2.4--	--4.8--	--7.2--	--9.6--	--12.0--	--14.4--
Late Season/ High Density	0.9	2.7	5.4	8.1	10.8	13.5	16.2
	1.0	3.0	6.0	9.0	12.0	15.0	18.0

* Application rates for depths greater than six feet may be obtained by adding the rates given for the appropriate combination of depths. Application rates should not result in excess of 1.0 ppm copper concentration within treated water.

CUTRINE®-PLUS: REWARD® TANK MIX

On waters where enforcement of use restrictions for recreational, domestic and irrigation uses are acceptable, the following mixture can be used as an alternative Hydrilla control method.

Tank mix 3-1/3 gallons of CUTRINE®-PLUS with 2 gallons of REWARD®. Apply mixture at the rate of 5-1/3 gallons per surface acre. Dilute with at least 9 parts water and apply as a surface spray or underwater injection. Observe all cautions and restrictions on the labels of both products used in this mixture.

REWARD® is a trademark of Zeneca Group Company
© Applied Biochemists 1988
3/99

PERMITS:
Some states may require permits for the application of this product to public waters. Check with your local authorities.

DRIP SYSTEM APPLICATION

FOR USE IN POTABLE WATER AND IRRIGATION CONVEYANCE SYSTEMS

- **CUTRINE®-PLUS** should be applied as soon as algae or Hydrilla begins to interfere noticeably with normal delivery of water (clogging of lateral headgates, suction screens, weed screens and siphon tubes). Delaying treatment could perpetuate the problem causing massing and compacting of plants. Heavy infestations and low flow may cause poor chemical distribution resulting in unsatisfactory control. Under these conditions, increasing flow rate during application may be necessary.
- Prior to treatment it is important to accurately determine water flow rates. In the absence of weirs, orifices, or similar devices which give accurate water flow measurements, volume of flow may be estimated by the following formula:

Average Width (feet) x Average Depth (feet) x Velocity* (feet/second) x 0.9 = Cubic Feet per Second (C.F.S.)

*Velocity is the time it takes a floating object to travel a given distance. Dividing the distance traveled (feet) by the time (seconds) will yield velocity (feet/second). This measurement should be repeated at least three times at the intended application site and then averaged.

- After accurately determining the water flow rate in C.F.S. or gallons/minute, find the corresponding **CUTRINE-PLUS** drip rate on the chart below.

WATER FLOW RATE		CUTRINE-PLUS DRIP RATE*		
C.F.S.	Gal/Min	Qts/Hr.	Ml/Min.	FL.Oz./Min.
1	450	1	16	0.5
2	900	2	32	1.1
3	1350	3	47	1.6
4	1800	4	63	2.1
5	2250	5	79	2.7

- Calculate the amount of **CUTRINE-PLUS** needed to maintain the drip rate for a period of 3 hours by multiplying Qts./Hr. x 3; ml/Min. x 180; or Fl. Oz./Min. x 180. Dosage will maintain 1.0 ppm Copper concentration in the treated water for the 3 hour period. Introduction of the chemical should be made in the channel at weirs or other turbulence-creating structures to promote the dispersion of chemical.
- Pour the required amount of **CUTRINE-PLUS** into a drum or tank equipped with a brass needle valve and constructed to maintain a constant drip rate. Use a stop watch and appropriate measuring container to set the desired drip rate. Readjust accordingly if flow rate changes during the 3 hour treatment period.
- Distance of control obtained down the waterway will vary depending upon density of vegetation growth. Periodic maintenance treatments may be required to maintain seasonal control.

GENERAL TREATMENT NOTES

The following suggestions apply to the use of **CUTRINE®-PLUS** as an algaecide, herbicide in all approved use sites.

For optimum effectiveness....

- Apply early in the day under calm, sunny conditions when water temperatures are at least 60°F.
- Treat when growth first begins to appear or create a nuisance, if possible.
- Apply in a manner that will ensure even distribution of the chemical within the treatment area.
- Re-treat areas if regrowth begins to appear and seasonal control is desired. Allow one to two weeks between consecutive treatments.
- Allow seven to ten days to observe the effects of treatment (bleaching and breaking apart of plant material).

PRECAUTIONARY STATEMENTS

HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

CORROSIVE. Causes irreversible eye damage and skin burns. Do not get in eyes, on skin, or on clothing. May cause sensitization reactions in certain individuals. Wear goggles or face shield and rubber gloves when handling this product. Wash thoroughly with soap and water after handling and before eating, drinking or using tobacco. Remove and wash contaminated clothing before reuse. Prolonged or frequently repeated skin contact may cause allergic reaction in some individuals.

STORAGE & DISPOSAL
Keep container closed when not in use. Do not contaminate water, food or feed by storage or disposal. Open dumping is prohibited.
PESTICIDE DISPOSAL: Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal Law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional office for guidance. CONTAINER DISPOSAL: Reseal container and offer for landfill, or incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke. Consult Federal, State or local authorities for approved alternative procedures.

ENVIRONMENTAL HAZARDS:
This product may be toxic to trout and other species of fish. Fish toxicity is dependent upon the hardness of water. Do not use in water containing trout if the carbonate hardness of water does not exceed 50 ppm. Do not discharge into lakes, streams, pond, estuaries, oceans or public waters unless in accordance with the requirements of a NPDES permit and the permitting authority has been notified in writing prior to discharge. Do not discharge effluent containing this product to sewer systems without previously notifying the sewage treatment plant authority. For guidance, contact your State Water Board or Regional Office of the Environmental Protection Agency.

NOTICE

Neither the manufacturer nor the seller makes any warranty, expressed or implied concerning the use of this product other than indicated on the label. Buyer assumes risk of use of this material when such use is contrary to label instructions. Read and follow the label directions carefully.

APPENDIX D

Specimen MAGNACIDE H® Herbicide Label

RESTRICTED USE PESTICIDE
DUE TO A HIGH ACUTE TOXICITY
For retail sale to and use only by Certified Applicators or persons under their direct supervision and only for those uses covered by the Certified Applicator's certification.

BAKER HUGHES

Baker Petrolite

MAGNACIDE® H HERBICIDE (Acrolein, Inhibited)

CONTENTS UNDER PRESSURE

EPA Reg. No. 10707-9 EPA Est. 10707-CA-005

ACTIVE INGREDIENT	BY WEIGHT
Acrolein	95%
INERT INGREDIENTS	5%
TOTAL	100%

This product contains the toxic inert ingredient hydroquinone.
(MAGNACIDE® H Herbicide contains 6.7 pounds of active ingredient per gallon.)

DANGER POISON

KEEP OUT OF REACH OF CHILDREN

PRECAUTIONARY STATEMENTS
HAZARDS TO HUMANS AND DOMESTIC ANIMALS

DANGER

EXTREMELY FLAMMABLE AND IRRITATING VAPOR AND LIQUID. POISONOUS BY INHALATION, SKIN CONTACT OR SWALLOWING. DO NOT BREATHE VAPOR. CORROSIVE. CAUSES EYE AND SKIN DAMAGE. DO NOT GET IN EYES, ON SKIN OR ON CLOTHING. KEEP AWAY FROM FIRE, SPARKS AND HEATED SURFACES.

When setting up and breaking down application equipment, a full-face air purifying respirator with organic vapor (OV) cartridges jointly approved by the Mine Safety and Health Administration (MSHA) and the National Institute of Occupational Safety and Health (NIOSH) and butyl rubber gloves must be worn. For visual inspection during treatment, chemical splash goggles must be worn. If spilled on clothing, gloves, or shoes, remove them immediately and wash thoroughly with soap and water before reuse. Use with adequate ventilation.

ENVIRONMENTAL HAZARDS

This product is toxic to fish and wildlife. Keep out of lakes, streams or ponds. Fish, shrimp and crabs will be killed at application rates recommended. Do not apply where they are important resources. Do not apply to water drainage areas where runoff or flooding will contaminate ponds, lakes, streams, tidal marshes and estuaries. Do not contaminate water by cleaning of equipment or disposal of wastes. Notify your State Fish and Game Agency before applying this product. Use only as specified.

PHYSICAL AND CHEMICAL HAZARDS

DANGER: Extremely flammable. Contents under pressure. Keep away from fire, sparks and heated surfaces. Do not puncture or incinerate container. Acrolein, the active ingredient in MAGNACIDE® H Herbicide, is highly reactive chemically and readily forms polymers. If alkalies (such as ammonia and caustic) or strong acids are brought in contact with MAGNACIDE® H Herbicide in a closed system, the herbicide can polymerize with sufficient violence to rupture the container. Do not apply with equipment used for acids and alkalies. Contamination of MAGNACIDE® H Herbicide with any foreign matter must be avoided.

A supply of sodium carbonate (soda ash) should be readily available for deactivating spilled MAGNACIDE® H Herbicide. All spills should be confined and deactivated before disposal. See the MAGNACIDE® H Herbicide Application and Safety Manual for additional information.

FIRST AID

If inhaled:
- Move person to fresh air.
- If person is not breathing, call 911 or an ambulance, then give artificial respiration, preferably by mouth-to-mouth, if possible.
- Call a poison control center or doctor for further treatment advice.

If on skin or clothing:
- Take off contaminated clothing.
- Rinse skin immediately with plenty of water for 15-20 minutes.
- Call a poison control center or doctor for treatment advice.

If in eyes:
- Hold eye open and rinse slowly and gently with water for 15-20 minutes.
- Remove contact lenses, if present, after 5 minutes, then continue rinsing eye.
- Call a poison control center or doctor for treatment advice.

If swallowed:
- Call a poison control center or doctor immediately for treatment advice.
- Have person sip a glass of water if able to swallow.
- Do not induce vomiting unless told to do so by the poison control center or doctor.
- Do not give anything by mouth to an unconscious person.

Have the product container, label or application manual with you when calling a poison control center or doctor, or going for treatment. CALL A PHYSICIAN IMMEDIATELY IN ALL CASES OF SUSPECTED POISONING.

NOTE TO PHYSICIAN

Probable mucosal damage may contraindicate the use of gastric lavage. Measures against circulatory shock, respiratory depression and convulsion may be needed.

WARNING SIGNS AND SYMPTOMS: Liquid MAGNACIDE® H Herbicide is absorbed by the skin and is particularly irritating to any lesion and to the eye. The vapors act principally on the mucous membrane of the eyes and respiratory tract. Because of the extreme lachrymatory warning effect, the concentration tolerable by man is far below the minimum lethal concentration.

TREATMENT: Treat exposed area as a chemical burn. Thoroughly flush eyes with water and treat symptomatically. Persons exposed to MAGNACIDE® H Herbicide vapors have a delayed reaction and experience irritation of the respiratory tract. In severe cases, this may progress to pulmonary edema. Therefore, it is advisable to keep persons exposed to MAGNACIDE® H Herbicide under observation for 24 hours following exposure.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling.
MAGNACIDE® H Herbicide is a water soluble material for the control of submersed and floating weeds and algae in irrigation canals. This material must be applied in accordance with directions in the MAGNACIDE® H Herbicide Application and Safety Manual by a certified applicator or under a certified applicator's supervision. Do not permit dairy animals to drink treated water. Do not use where waters will flow into potential sources of drinking water. Water treated with MAGNACIDE® H Herbicide must be used for irrigation of fields, either crop bearing, fallow or pasture, where the treated water remains on the field OR held for 6 days before being released into fish bearing waters or where it will drain into them.

STORAGE AND DISPOSAL
STORAGE OF MAGNACIDE® H HERBICIDE TANKS

All containers of MAGNACIDE® H Herbicide should be stored in a secured, well-ventilated area, away from all other chemicals. No alkalies or oxidizing materials should be near. Any electrical equipment should be Class 1 - Division 2 and properly grounded. Do not reuse empty container. Return empty containers to Baker Petrolite Corporation.

DISPOSAL

Pesticide wastes are acutely hazardous. Improper disposal of excess pesticide, spray mixture, or rinsate is a violation of Federal law. If these wastes cannot be disposed of by use according to label instructions, contact your State Pesticide or Environmental Control Agency, or the Hazardous Waste representative at the nearest EPA Regional Office for guidance.

NOTICE OF WARRANTY

BAKER PETROLITE CORPORATION MAKES NO WARRANTY OF MERCHANTABILITY FITNESS FOR ANY PURPOSE, OR OTHERWISE, EXPRESSED OR IMPLIED concerning this product or its uses which extend beyond the use of the product under normal conditions in accord with the statements made on this label.

NET WEIGHTS

Cylinder-370 lbs. Skid Tank-2450 lbs.

Acrolein, Inhibited, 6.1, (3), UN 1092, PG I, Toxic-Inhalation Hazard, Zone A, Marine Pollutant, RQ

RC 0601

MANUFACTURED BY: BAKER PETROLITE CORPORATION 12645 W. Airport Blvd., Sugar Land, TX 77478 Customer Care: 800-872-1916

This sample label is current as of 10/27/99. The product descriptions and recommendations provided in this sample label are for background information only. Always refer to the label on the product before using Monsanto or any other agrichemical product.

21195Y1-1/CG

Complete Directions for Use in Aquatic and Other Noncrop Sites.

EPA Reg. No. 524-343

AVOID CONTACT OF HERBICIDE WITH FOLIAGE, GREEN STEMS, EXPOSED NON-WOODY ROOTS OR FRUIT OF CROPS, DESIRABLE PLANTS AND TREES, BECAUSE SEVERE INJURY OR DESTRUCTION IS LIKELY TO RESULT.

AquaMaster is a trademark of Monsanto Company.

2000-1

Read the entire label before using this product.

Use only according to label instructions.

It is a violation of Federal law to use this product in any manner inconsistent with its labeling.

Not all products recommended on this label are registered for use in California. Check the registration status of each product in California before using.

Read the "LIMIT OF WARRANTY AND LIABILITY" statement at the end of the label before buying or using. If terms are not acceptable, return at once unopened.

THIS IS AN END-USE PRODUCT. MONSANTO DOES NOT INTEND AND HAS NOT REGISTERED IT FOR REFORMULATION OR REPACKAGING. SEE INDIVIDUAL CONTAINER LABEL FOR REPACKAGING LIMITATIONS.

.0 INGREDIENTS

ACTIVE INGREDIENT:	
*Glyphosate, N-(phosphonomethyl)glycine, in the form of its isopropylamine salt	53.8%
OTHER INGREDIENTS:	46.2%
	100.0%

*Contains 648 grams per litre or 5.4 pounds per U.S. gallon of the active ingredient, glyphosate, in the form of its isopropylamine salt. Equivalent to 480 grams per litre or 4 pounds per U.S. gallon of the acid, glyphosate.

.0 IMPORTANT PHONE NUMBERS

1. FOR PRODUCT INFORMATION OR ASSISTANCE IN USING THIS PRODUCT, CALL TOLL-FREE, 1-800-332-3111
2. IN CASE OF AN EMERGENCY INVOLVING THIS PRODUCT, OR FOR MEDICAL ASSISTANCE, CALL COLLECT, DAY OR NIGHT, (314)-694-4000

.0 PRECAUTIONARY STATEMENTS

.1 Hazards to Humans and Domestic Animals

Keep out of reach of children.

CAUTION!

Remove contaminated clothing and wash clothing before reuse.

Wash thoroughly with soap and water after handling.

.2 Environmental Hazards

Do not contaminate water when disposing of equipment washwaters. Treatment of aquatic weeds can result in oxygen depletion or loss due to decomposition of dead plants. This oxygen loss can cause fish suffocation.

In case of: SPILL or LEAK, soak up and remove to a landfill.

.3 Physical or Chemical Hazards

Spray solutions of this product should be mixed, stored and applied using only stainless steel, aluminum, fiberglass, plastic or plastic-lined steel containers.

DO NOT MIX, STORE OR APPLY THIS PRODUCT OR SPRAY SOLUTIONS OF THIS PRODUCT IN GALVANIZED STEEL OR UNLINED STEEL (EXCEPT STAINLESS STEEL) CONTAINERS OR SPRAY TANKS. This product or spray solutions of this product react with such containers and tanks to produce hydrogen gas which may form a highly combustible gas mixture. This gas mixture could flash or explode, causing serious personal injury, if ignited by open flame, spark, welder's torch, lighted cigarette or other ignition source.

DIRECTIONS FOR USE

It is a violation of Federal law to use this product in any manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulations.

.0 STORAGE AND DISPOSAL

Do not contaminate water, foodstuffs, feed or seed by storage or disposal.

STORAGE: STORE ABOVE 10°F (-12°C) TO KEEP PRODUCT FROM CRYSTALLIZING. Crystals will settle to the bottom. If allowed to crystallize, place in a warm room 68°F (20°C) for several days to redissolve and roll or shake container or recirculate in mini-bulk containers to mix well before using.

DISPOSAL: Wastes resulting from the use of this product that cannot be used or chemically reprocessed should be disposed of in a landfill approved for pesticide disposal or in accordance with applicable Federal, state, or local procedures.

Emptied container retains vapor and product residue. Observe all labeled safeguards until container is cleaned, reconditioned, or destroyed.

FOR REFILLABLE PORTABLE CONTAINERS: Do not reuse this container except for refill in accordance with a valid Monsanto Repackaging or Toll Repackaging Agreement. If not refilled or returned to the authorized repackaging facility, triple rinse container, then puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

FOR METAL CONTAINERS (non-aerosol): Triple rinse (or equivalent). Then offer for recycling or reconditioning, or puncture and dispose of in a sanitary landfill, or by other procedures approved by state and local authorities.

FOR BULK CONTAINERS: Triple rinse emptied bulk container. Then offer for recycling or reconditioning, or dispose of in a manner approved by state and local authorities.

FOR PLASTIC 1-WAY CONTAINERS AND BOTTLES: Do not reuse container. Triple rinse container, then puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

FOR DRUMS: Do not reuse container. Return container per the Monsanto container return program. If not returned, triple rinse container, then puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

.0 GENERAL INFORMATION

This product, a water-soluble liquid, mixes readily with water and nonionic surfactant to be applied as a foliar spray for the control or destruction of many herbaceous and woody plants.

This product moves through the plant from the point of foliage contact to and into the root system. Visible effects on most annual weeds occur within 2 to 4 days but on most perennial brush species may not occur for 7 days or more. Extremely cool or cloudy weather following treatment may slow the activity of this product and delay visual effects of control. Visible effects are a gradual wilting and yellowing of the plant which advances to complete browning of above-ground growth and deterioration of underground plant parts.

Unless otherwise directed on this label, delay application until vegetation has emerged and reached the stages described for control of such vegetation under the "WEEDS CONTROLLED" section of this label.

Unemerged plants arising from unattached underground rhizomes or root stocks of perennials or brush will not be affected by the spray and will continue to grow. For this reason best control of most perennial weeds or brush is obtained when treatment is made at late growth stages approaching maturity.

Always use the higher rate of this product per acre within the recommended range when vegetation is heavy or dense.

Do not treat weeds or brush under poor growing conditions such as drought stress, disease or insect damage, as reduced control may result. Reduced results may also occur when treating weeds or brush heavily covered with dust.

Reduced control may result when applications are made to any weed or brush species that have been mowed, grazed or cut, and have not been allowed to regrow to the recommended stage for treatment.

Rainfall or irrigation occurring within 6 hours after application may reduce effectiveness. Heavy rainfall or irrigation within 2 hours after application may wash the product off the foliage and a repeat treatment may be required.

When this product comes in contact with soil (on the soil surface or as suspended soil or sediment in water) it is bound to soil particles. Under recommended use situations, once this product is bound to soil particles, it is not available for plant uptake and will not harm off-site vegetation where roots grow into the treatment area or if the soil is transported off-site. Under recommended use conditions, the strong affinity of this product to soil particles prevents this product from leaching out of the soil profile and entering ground water. The affinity between this product and soil particles remains until this product is degraded, which is primarily a biological degradation process carried out under both aerobic and anaerobic conditions by soil microflora.

This product does not provide residual weed control. For subsequent residual weed control, follow a label-approved herbicide program. Read and carefully observe the cautionary statements and all other information appearing on the labels of all herbicides used.

Buyer and all users are responsible for all loss or damage in connection with the use or handling of mixtures of this product or other materials that are not expressly recommended in this label. Mixing this product with herbicides or other materials not recommended in this label may result in reduced performance.

ATTENTION

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended. The likelihood of plant or crop injury occurring from the use of this product is greatest when winds are gusty or in excess of 5 miles per hour or when other conditions, including lesser wind velocities, will allow spray drift to occur. When spraying, avoid combinations of pressure and nozzle type that will result in splatter or fine particles (mist) which are likely to drift. AVOID APPLYING AT EXCESSIVE SPEED OR PRESSURE.

NOTE: Use of this product in any manner not consistent with this label may result in injury to persons, animals or crops, or other unintended consequences. When not in use, keep container closed to prevent spills and contamination.

.0 MIXING

Clean sprayer parts immediately after using this product by thoroughly flushing with water.

NOTE: REDUCED RESULTS MAY OCCUR IF WATER CONTAINING SOIL IS USED, SUCH AS VISIBLY MUDDY WATER OR WATER FROM PONDS AND DITCHES THAT IS NOT CLEAR.

.1 Mixing with Water and Surfactant

This product mixes readily with water. Mix spray solutions of this product as follows: Fill the mixing or spray tank with the required amount of water. Add the recommended amount of this product and the required surfactant near the end of the filling process and mix well. Use caution to avoid siphoning back into the carrier source. Use approved anti-back-siphoning devices where required by state or local regulations. During mixing and application, foaming of the spray solution may occur. To prevent or minimize foam, avoid the use of mechanical agitators, terminate by-pass and return lines at the bottom of the tank and, if needed, use an approved anti-foam or defoaming agent.

Maintain good agitation at all times until the contents of the tank are sprayed. If the spray mixture is allowed to settle, thorough agitation may be required to resuspend the mixture before spraying is resumed.

Keep by-pass line on or near the bottom of the tank to minimize foaming. Screen size in nozzle or line strainers should be no finer than 50 mesh.

When using this product, mix 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution. Use a nonionic surfactant labeled for use with herbicides. The surfactant must contain 50 percent or more active ingredient.

These surfactants should not be used in excess of 1 quart per acre when making **broadcast** applications.

Always read and follow the manufacturer's surfactant label recommendations for best results. Carefully observe all cautionary statements and other information appearing in the surfactant label.

.2 Mixing for Hand-Held Sprayers

Prepare the desired volume of spray solution by mixing the amount of this product in water as shown in the following table:

Spray Solution

DESIRED	AMOUNT OF AQUAMASTER™					
VOLUME	¾%	1%	1¼%	1½%	5%	8%
1 Gal	1 oz.	1⅓ oz.	1⅔ oz.	2 oz.	6 oz.	10¼ oz.
25 Gal	1½ pt.	1 qt.	1¼ qt.	1½ qt.	5 qt.	2 gal.
100 Gal	3 qt.	1 gal.	1¼ gal.	1½ gal.	5 gal.	8 gal.

2 tablespoons = 1 fluid ounce

For use in backpack, knapsack or pump-up sprayers, it is suggested that the recommended amount of this product be mixed with water in a larger container. Fill sprayer with the mixed solution and add the correct amount of surfactant.

.3 Colorants or Dyes

Agriculturally-approved colorants or marking dyes may be added to this product. Colorants or dyes used in spray solutions of this product may reduce performance, especially at

lower rates or dilution. Use colorants or dyes according to the manufacturer's recommendations.

.0 APPLICATION EQUIPMENT AND TECHNIQUES

Do not apply this product through any type of irrigation system.

APPLY THESE SPRAY SOLUTIONS IN PROPERLY MAINTAINED AND CALIBRATED EQUIPMENT CAPABLE OF DELIVERING DESIRED VOLUMES.

SPRAY DRIFT MANAGEMENT

AVOID DRIFT. EXTREME CARE MUST BE USED WHEN APPLYING THIS PRODUCT TO PREVENT INJURY TO DESIRABLE PLANTS AND CROPS.

Do not allow the herbicide solution to mist, drip, drift or splash onto desirable vegetation since minute quantities of this product can cause severe damage or destruction to the crop, plants or other areas on which treatment was not intended.

Avoiding spray drift at the application site is the responsibility of the applicator. The interaction of many equipment-and-weather-related factors determine the potential for spray drift. The applicator and the grower are responsible for considering all these factors when making decisions.

AERIAL SPRAY DRIFT MANAGEMENT

The following drift management requirements must be followed to avoid off-target drift movement from aerial applications to agricultural field crops. These requirements do not apply to forestry applications or to public health uses.

1. The distance of the outermost nozzles on the boom must not exceed 3/4 the length of the wingspan or rotor.
2. Nozzles must always point backward parallel with the air stream and never be pointed downwards more than 45 degrees. Where states have more stringent regulations, they should be observed.

Importance of Droplet Size

The most effective way to reduce drift potential is to apply large droplets. The best drift management strategy is to apply the largest droplets that provide sufficient coverage and control. Applying larger droplets reduces drift potential, but will not prevent drift if applications are made improperly, or under unfavorable environmental conditions (see the **"WIND"**, **"TEMPERATURE AND HUMIDITY"**, and **"TEMPERATURE INVERSION"** sections of this label).

Controlling Droplet Size

- **Volume:** Use high flow rate nozzles to apply the highest practical spray volume. Nozzles with the higher rated flows produce larger droplets.
- **Pressure:** Use the lower spray pressures recommended for the nozzle. Higher pressure reduces droplet size and does not improve canopy protection. When higher flow rates are needed, use higher flow rate nozzles instead of increasing pressure.
- **Number of nozzles:** Use the minimum number of nozzles that provide uniform coverage.
- **Nozzle orientation:** Orienting nozzles so that the spray is released backwards, parallel to the airstream, will produce larger droplets than other orientations. Significant deflection from the horizontal will reduce droplet size and increase drift potential.
- **Nozzle type:** Use a nozzle type that is designed for the intended application. With most nozzle types, narrower spray angles produce larger droplets. Consider using low-drift nozzles. Solid stream nozzles oriented straight back produce larger droplets than other nozzle types.
- **Boom length:** For some use patterns, reducing the effective boom length to less than 3/4 of the wingspan or rotor length may further reduce drift without reducing swath width.
- **Application height:** Applications should not be made at a height greater than 10 feet above the top of the largest plants unless a greater height is required for aircraft safety. Making applications at the lowest height that is safe reduces the exposure of the droplets to evaporation and wind.

Swath Adjustment

When applications are made with a crosswind, the swath will be displaced downward. Therefore, on the up and downwind edges of the field, the applicator must compensate for this displacement by adjusting the path of the aircraft upwind. Swath adjustment distance should increase, with increasing drift potential (higher wind, smaller droplets, etc.).

Wind

Drift potential is lowest between wind speeds of 2 to 10 mph. However, many factors, including droplet size and equipment type determine drift potential at any given speed. Application should be avoided below 2 mph due to variable wind direction and high inversion potential. **NOTE:** Local terrain can influence wind patterns. Every applicator should be familiar with local wind patterns and how they affect drift.

Temperature and Humidity

When making applications in low relative humidity, set up equipment to produce larger droplets to compensate for evaporation. Droplet evaporation is most severe when conditions are both hot and dry.

Temperature Inversions

Applications should not occur during a temperature inversion because drift potential is high. Temperature inversions restrict vertical air mixing, which causes small suspended droplets to remain in a concentrated cloud. This cloud can move in unpredictable directions due to the light variable winds common during inversions. Temperature inversions are characterized by increasing temperatures with altitude and are common on nights with limited cloud cover and light to no wind. They begin to form as the sun sets and often continue into the morning. Their presence can be indicated by ground fog; however, if fog is not present, inversions can also be identified by the movement of smoke from a ground source or an aircraft smoke generator. Smoke that layers and moves laterally in a concentrated cloud (under low wind conditions) indicates an inversion, while smoke that moves upward and rapidly dissipates indicates good vertical air mixing.

Sensitive Areas

The pesticide should only be applied when the potential for drift to adjacent sensitive areas (e.g., residential areas, bodies of water, known habitat for threatened or endangered species, non-target crops) is minimal (e.g., when wind is blowing away from the sensitive areas).

.1 Aerial Equipment

DO NOT APPLY THIS PRODUCT USING AERIAL SPRAY EQUIPMENT EXCEPT UNDER CONDITIONS AS SPECIFIED WITHIN THIS LABEL.

FOR AERIAL APPLICATION IN CALIFORNIA, REFER TO THE FEDERAL SUPPLEMENTAL LABEL FOR AERIAL APPLICATIONS IN THAT STATE FOR SPECIFIC INSTRUCTIONS, RESTRICTIONS AND REQUIREMENTS.

AVOID DRIFT—DO NOT APPLY DURING LOW-LEVEL INVERSION CONDITIONS, WHEN WINDS ARE GUSTY OR UNDER ANY OTHER CONDITION WHICH FAVORS DRIFT. DRIFT IS LIKELY TO CAUSE DAMAGE TO ANY VEGETATION CONTACTED TO WHICH TREATMENT IS NOT INTENDED. TO PREVENT INJURY TO ADJACENT DESIRABLE VEGETATION, APPROPRIATE BUFFER ZONES MUST BE MAINTAINED.

Use the recommended rates of this product and surfactant in 3 to 20 gallons of water per acre as a broadcast spray, unless otherwise specified.

Coarse sprays are less likely to drift; therefore, do not use nozzles or nozzle configurations which dispense spray as fine spray droplets. Do not angle nozzles forward into the airstream and do not increase spray volume by increasing nozzle pressure.

Drift control additives may be used. When a drift control additive is used, read and carefully observe the cautionary statements and all other information appearing on the additive label.

Ensure uniform application—To avoid streaked, uneven or overlapped application, use appropriate marking devices.

PROLONGED EXPOSURE OF THIS PRODUCT TO UNCOATED STEEL SURFACES MAY RESULT IN CORROSION AND POSSIBLE FAILURE OF THE PART. The maintenance of an organic coating (paint) which meets aerospace specification

MIL-C-38413 may prevent corrosion. To prevent corrosion of exposed parts, thoroughly wash aircraft after each day of spraying to remove residues of this product accumulated during spraying or from spills. Landing gear are most susceptible.

.2 Ground Broadcast Equipment

Use the recommended rates of this product in 3 to 40 gallons of water per acre as a broadcast spray unless otherwise specified. See the "WEEDS CONTROLLED" section of this label for specific rates. As density of weeds increases, spray volume should be increased within the recommended range to ensure complete coverage. Carefully select proper nozzles to avoid spraying a fine mist. For best results with ground application equipment, use flat fan nozzles. Check for even distribution of spray droplets.

.3 Hand-Held and High-Volume Equipment

Use Coarse Sprays Only

For control of weeds listed in this label using backpack or knapsack sprayers or high-volume spraying equipment utilizing handguns or other suitable nozzle arrangements—Prepare a 3/4 to 2 percent solution of this product in water, add a nonionic surfactant and apply to foliage of vegetation to be controlled. For specific rates of application and instructions for control of various annual and perennial weeds, see the "WEEDS CONTROLLED" section in this label.

Applications should be made on a spray-to-wet basis. Spray coverage should be uniform and complete. Do not spray to point of runoff.

This product may be used as a 5 to 8 percent solution for low-volume directed sprays for spot treatment of trees and brush. It is most effective in areas where there is a low density of undesirable trees or brush. If a straight stream nozzle is used, start the application at the top of the targeted vegetation and spray from top to bottom in a lateral zig-zag motion. Ensure that at least 50 percent of the leaves are contacted by the spray solution. For flat fan and cone nozzles and with hand-directed mist blowers, mist the application over the foliage of the targeted vegetation. Small, open-branched trees need only be treated from one side. If the foliage is thick or there are multiple root sprouts, applications must be made from several sides to ensure adequate spray coverage.

.4 Selective Equipment (Wiper Applications)

A wiper or sponge applicator applies the herbicide solution onto weeds by rubbing the weed with an absorbent material containing the herbicide solution.

Wiper applications can be used to control or suppress annual and perennial weeds listed on this label. In heavy weed stands, a double application in opposite directions may improve results. See the "WEEDS CONTROLLED" section in this label for recommended timing, growth stage and other instructions for achieving optimum results.

AVOID CONTACT OF HERBICIDE WITH DESIRABLE VEGETATION AS SERIOUS INJURY OR DEATH IS LIKELY TO OCCUR.

For wick or wiper applications, mix 2 1/2 gallons of this product plus 1 quart of a nonionic surfactant with 7 1/4 gallons of clean water to prepare a 25 percent solution.

Mix only the amount of solution to be used during a 1-day period, as reduced activity may result from use of leftover solutions. Clean wiper parts immediately after using this product by thoroughly flushing with water.

.0 SITE AND USE RECOMMENDATIONS

Detailed instructions follow alphabetically, by site.

Unless otherwise specified, applications may be made to control any weeds listed in the annual, perennial and woody brush tables. Refer also to the "SELECTIVE EQUIPMENT" section.

.1 Aquatic and Other Noncrop Sites

When applied as directed and under the conditions described in the "WEEDS CONTROLLED" section in this label, this product will control or partially control the labeled weeds growing in the following industrial, recreational and public areas or other similar aquatic and terrestrial sites.

Aquatic Sites

This product may be applied to emerged weeds in all bodies of fresh and brackish water which may be flowing, nonflowing or transient. This includes lakes, rivers, streams, ponds, estuaries, rice levees, seeps, irrigation and drainage ditches, canals, reservoirs, wastewater treatment facilities, wildlife habitat restoration and management areas, and similar sites.

If aquatic sites are present in the noncrop area and are part of the intended treatment, read and observe the following directions:

This product does not control plants which are completely submerged or have a majority of their foliage under water.

There is no restriction on the use of treated water for irrigation, recreation or domestic purposes.

Consult local state fish and game agency and water control authorities before applying this product to public water. Permits may be required to treat such water.

NOTE: Do not apply this product **directly to water** within 1/2 mile up-stream of an active potable water intake in flowing water (i.e., river, stream, etc.) or within 1/2 mile of an active potable water intake in a standing body of water such as lake, pond or reservoir. To make aquatic applications around and within 1/2 mile of active potable water intakes, the water intake must be turned off for a minimum period of 48 hours after the application. The water intake may be turned on prior to 48 hours if the glyphosate level in the intake water is below 0.7 parts per million as determined by laboratory analysis. These aquatic applications may be made ONLY in those cases where there are alternative water sources or holding ponds which would permit the turning off of an active potable water intake for a minimum period of 48 hours after the applications. This restriction does **NOT** apply to intermittent inadvertent overspray of water in terrestrial use sites.

For treatments after drawdown of water or in dry ditches, allow 7 or more days after treatment before reintroduction of water to achieve maximum weed control. Apply this product within 1 day after drawdown to ensure application to actively growing weeds.

Floating mats of vegetation may require retreatment. Avoid wash-off of sprayed foliage by spray boat or recreational boat backwash or by rainfall within 6 hours of application. Do not re-treat within 24 hours following the initial treatment.

Applications made to moving bodies of water must be made while traveling upstream to prevent concentration of this herbicide in water. When making any bankside applications, do not overlap more than 1 foot into open water. Do not spray in bodies of water where weeds do not exist. The maximum application rate of 7 1/2 pints per acre must not be exceeded in any single broadcast application that is being made over water.

When emerged infestations require treatment of the total surface area of impounded water, treating the area in strips may avoid oxygen depletion due to decaying vegetation. Oxygen depletion may result in fish kill.

Other Noncrop-Type Sites—This product may be used to control the listed weeds in terrestrial noncrop sites and/or in aquatic sites within these areas:

Airports
Golf Courses
Habitat Restoration & Management Areas
Highways
Industrial Plant Sites
Lumberyards
Natural Areas
Parking Areas
Parks
Petroleum Tank Farms
Pipeline, Power, Telephone & Utility Rights-of-Way
Pumping Installations
Railroads
Roadsides
Schools
Storage Areas
Similar Industrial and Non-crop Sites

.2 Cut Stump Application

Cut stump treatments may be made on any site listed on this label. This product will control many types of woody brush and tree species, some of which are listed below. Apply this product using suitable equipment to ensure coverage of the entire cambium. Cut trees or resprouts close to the soil surface. **Apply a 50 to 100 percent solution of this product to the freshly-cut surface immediately after cutting.** Delays in application may result in reduced performance. For best results, applications should be made during periods of active growth and full leaf expansion.

When used according to directions for cut stump application, this product will CONTROL, PARTIALLY CONTROL or SUPPRESS most woody brush and tree species, some of which are listed below:

Alder
Alnus spp.

Coyote brush*
Baccharis consanguinea

Dogwood*
Cornus spp.

Eucalyptus
Eucalyptus spp.

Hickory*
Carya spp.

Madrone
Arbutus menziesii

Maple*
Acer spp.

Oak
Quercus spp.

Poplar*
Populus spp.

Reed, giant
Arundo donax

Salt cedar
Tamarix spp.

Sweet gum*
Liquidambar styraciflua

Sycamore*
Platanus occidentalis

Tan oak
Lithocarpus densiflorus

Willow
Salix spp.

*This product is not approved for this use on these species in the State of California.

DO NOT MAKE CUT STUMP APPLICATIONS WHEN THE ROOTS OF DESIRABLE WOODY BRUSH OR TREES MAY BE GRAFTED TO THE ROOTS OF THE CUT STUMP. INJURY RESULTING FROM ROOT GRAFTING IS LIKELY TO OCCUR IN ADJACENT WOODY BRUSH OR TREES.

.3 Habitat Restoration and Management

This product is recommended for the restoration and/or maintenance of native habitat and in wildlife management areas.

Habitat Restoration and Management

This product may be used to control exotic, alien and other undesirable vegetation in habitat management and natural areas, including riparian and estuarine areas, and wildlife refuges. Applications can be made to allow recovery of native plant species, prior to planting desirable native species, and for similar broad spectrum vegetation control requirements. Spot treatments can be made to selectively remove unwanted plants for habitat management and enhancement.

Wildlife Food Plots

This product may be used as a site preparation treatment prior to planting wildlife food plots. Any wildlife food species, including natives, may be planted after applying this product, or native species may be allowed to repopulate the area. If tillage is needed to prepare a seedbed, wait 7 days after application before tillage to allow translocation into underground plant parts.

.4 Injection and Frill Applications

Woody vegetation may be controlled by injection or frill application of this product. Apply this product using suitable equipment which must penetrate into living tissue. Apply the equivalent of 1 ml of this product per 2 to 3 inches of trunk diameter. This is best achieved by applying 25 to 100 percent concentration of this product either to a continuous frill around the tree or as cuts evenly spaced around the tree below all branches. As tree diameter increases in size, better results are achieved by applying dilute material to a continuous frill or more closely spaced cuttings. Avoid application techniques that allow runoff to occur from frill or cut areas in species that exude sap freely after frills or cutting. In species such as these, make frill or cut at an oblique angle so as to produce a cupping effect and use undiluted material. For best results, applications should be made during periods of active growth and full leaf expansion.

This treatment WILL CONTROL the following woody species:

Oak
Quercus spp.

Poplar
Populus spp.

Sweet gum
Liquidambar styraciflua

Sycamore
Platanus occidentalis

This treatment WILL SUPPRESS the following woody species:

Black gum*
Nyssa sylvatica

Dogwood
Cornus spp.

Hickory
Carya spp.

Maple, red
Acer rubrum

DO NOT MAKE INJECTION OR FRILL APPLICATIONS WHEN THE ROOTS OF DESIRABLE WOODY BRUSH OR TREES MAY BE GRAFTED TO THE ROOTS OF THE TREATED TREES. INJURY RESULTING FROM ROOT GRAFTING IS LIKELY TO OCCUR IN ADJACENT WOODY BRUSH OR TREES.

*This product is not approved for this use on this species in the State of California.

.5 Roadsides

RELEASE OF DORMANT BERMUDAGRASS AND BAHIAGRASS

When applied as directed, this product will provide control or suppression of many winter annual weeds and tall fescue for effective release of dormant bermudagrass or bahiagrass. Make applications to dormant bermudagrass or bahiagrass.

For best results on winter annuals, treat when weeds are in an early growth stage (below 6 inches in height) after most have germinated. For best results on tall fescue, treat when fescue is in or beyond the 4- to 6-leaf stage.

WEEDS CONTROLLED

Rate recommendations for control or suppression of winter annuals and tall fescue are listed below.

Apply the recommended rates of this product in 10 to 25 gallons of water per acre plus 2 quarts nonionic surfactant per 100 gallons of total spray volume.

WEEDS CONTROLLED OR SUPPRESSED*

NOTE: C = Control
S = Suppression

WEED SPECIES	AQUAMASTER FLUID OZ/ACRE 6	9	12	18	24	48
Barley, little *Hordeum pusillum*	S	C	C	C	C	C
Bedstraw, catchweed *Galium aparine*	S	C	C	C	C	C
Bluegrass, annual *Poa annua*	S	C	C	C	C	C
Chervil *Chaerophyllum tainturieri*	S	C	C	C	C	C
Chickweed, common *Stellaria media*	S	C	C	C	C	C
Clover, crimson *Trifolium incarnatum*	•	S	S	C	C	C
Clover, large hop Trifolium campestre	•	S	S	C	C	C
Speedwell, corn *Veronica arvensis*	S	C	C	C	C	C
Fescue, tall *Festuca arundinacea*	•	•	•	•	S	S
Geranium, Carolina *Geranium carolinianum*	•	•	S	S	C	C
Henbit *Lamium amplexicaule*	•	S	C	C	C	C
Ryegrass, Italian *Lolium multiflorum*	•	•	S	C	C	C
Vetch, common *Vicia sativa*	•	•	S	C	C	C

*These rates apply only to sites where an established competitive turf is present.

RELEASE OF ACTIVELY GROWING BERMUDAGRASS

NOTE: USE ONLY ON SITES WHERE BAHIAGRASS OR BERMUDAGRASS ARE DESIRED FOR GROUND COVER AND SOME TEMPORARY INJURY OR YELLOWING OF THE GRASSES CAN BE TOLERATED.

When applied as directed, this product will aid in the release of bermudagrass by providing control of annual species listed in the "WEEDS CONTROLLED" section in this label, and suppression or partial control of certain perennial weeds.

For control or suppression of those annual species listed in this label, use 3/4 to 2 1/4 pints of this product as a broadcast spray in 10 to 25 gallons of spray solution per acre, plus 2 quarts of a nonionic surfactant per 100 gallons of total spray volume. Use the lower rate when treating annual weeds below 6 inches in height (or length of runner in annual vines). Use the higher rate as size of plants increases or as they approach flower or seedhead formation.

Use the higher rate for partial control or longer-term suppression of the following perennial species. Use lower rates for shorter-term suppression of growth.

Bahiagrass	Johnsongrass**
Dallisgrass	Trumpetcreeper*
Fescue (tall)	Vaseygrass

*Suppression at the higher rate only.

**Johnsongrass is controlled at the higher rate.

Use only on well-established bermudagrass. Bermudagrass injury may result from the treatment but regrowth will occur under moist conditions. Repeat applications in the same season are not recommended, since severe injury may result.

BAHIAGRASS SEEDHEAD AND VEGETATIVE SUPPRESSION

When applied as directed in the "NONCROP SITES" section in this label, this product will provide significant inhibition of seedhead emergence and will suppress vegetative growth for a period of approximately 45 days with single applications and approximately 120 days with sequential applications.

Apply this product 1 to 2 weeks after full green-up of bahiagrass or after the bahiagrass has been mowed to a uniform height of 3 to 4 inches. Applications must be made prior to seedhead emergence. Apply 5 fluid ounces per acre of this product, plus 2 quarts of an approved nonionic surfactant per 100 gallons of total spray volume in 10 to 25 gallons of water per acre.

Sequential applications of this product plus nonionic surfactant may be made at approximately 45-day intervals to extend the period of seedhead and vegetative growth suppression. For continued vegetative growth suppression, sequential applications must be made prior to seedhead emergence.

Apply no more than 2 sequential applications per year. As a first sequential application, apply 3 fluid ounces of this product per acre plus nonionic surfactant. A second sequential application of 2 to 3 fluid ounces per acre plus nonionic surfactant may be made approximately 45 days after the last application.

ANNUAL GRASS GROWTH SUPPRESSION

For growth suppression of some annual grasses, such as annual ryegrass, wild barley and wild oats growing in coarse turf on roadsides or other industrial areas, apply 3 to 4 ounces of this product in 10 to 40 gallons of spray solution per acre. Mix 2 quarts of a nonionic surfactant per 100 gallons of spray solution. Applications should be made when annual grasses are actively growing and before the seedheads are in the boot stage of development. Treatments made after seedhead emergence may cause injury to the desired grasses.

.0 WEEDS CONTROLLED

.1 Annual Weeds

Apply to actively growing annual grasses and broadleaf weeds.

Allow at least 3 days after application before disturbing treated vegetation. After this period the weeds may be mowed, tilled or burned. See "DIRECTIONS FOR USE", "GENERAL INFORMATION" and "MIXING AND APPLICATION INSTRUCTIONS" for labeled uses and specific application instructions.

Broadcast Application—Use 1 1/2 pints of this product per acre plus 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution if weeds are less than 6 inches tall. If weeds are greater than 6 inches tall, use 2 1/2 pints of this product per acre plus 2 or more quarts of an approved nonionic surfactant per 100 gallons of spray solution.

Hand-Held, High-Volume Application—Use a 3/4 to 1 1/2 percent solution of this product in water plus 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution and apply to foliage of vegetation to be controlled. Use the higher rate for tough-to-control species or for weeds over 24 inches tall.

When applied as directed under the conditions described in this label, this product plus nonionic surfactant WILL CONTROL the following ANNUAL WEEDS:

Balsamapple**
Momordica charantia

Barley
Hordeum vulgare

Barnyardgrass
Echinochloa crus-galli

Bassia, fivehook
Bassia hyssopifolia

Bluegrass, annual
Poa annua

Bluegrass, bulbous
Poa bulbosa

Brome
Bromus spp.

Buttercup
Ranunculus spp.

Cheat
Bromus secalinus

Cheeseweed
Malva parviflora

Chickweed, mouseear
Cerastium vulgatum

Cocklebur
Xanthium strumarium

Corn, volunteer
Zea mays

Crabgrass
Digitaria spp.

Dwarfdandelion
Krigia cespitosa

Falseflax, smallseed
Camelina microcarpa

Fiddleneck
Amsinckia spp.

Flaxleaf fleabane
Conyza bonariensis

Fleabane
Erigeron spp.

Foxtail
Setaria spp.

Foxtail, Carolina
Alopecurus carolinianus

Groundsel, common
Senecio vulgaris

Horseweed/Marestail
Conyza canadensis

Kochia
Kochia scoparia

Lambsquarters, common
Chenopodium album

Lettuce, prickly
Lactuca serriola

Morningglory
Ipomoea spp.

Mustard, blue
Chorispora tenella

Mustard, tansy
Descurainia pinnata

Mustard, tumble
Sisymbrium altissimum

Mustard, wild
Sinapis arvensis

Oats, wild
Avena fatua

Panicum
Panicum spp.

Pennycress, field
Thlaspi arvense

Pigweed, redroot
Amaranthus retroflexus

Pigweed, smooth
Amaranthus hybridus

Puncturevine
Tribulus terrestris

Ragweed, common
Ambrosia artemisiifolia

Ragweed, giant
Ambrosia trifida

Rocket, London
Sisymbrium irio

Rye
Secale cereale

Ryegrass, Italian*
Lolium multiflorum

Sandbur, field
Cenchrus spp.

Shattercane
Sorghum bicolor

Shepherd's-purse
Capsella bursa-pastoris

Signalgrass, broadleaf
Brachiaria platyphylla

Smartweed, Pennsylvania
Polygonum pensylvanicum

Sowthistle, annual
Sonchus oleraceus

Spanishneedles*
Bidens bipinnata

Stinkgrass
Eragrostis cilianensis

Sunflower
Helianthus annuus

Thistle, Russian
Salsola kali

Spurry, umbrella
Holosteum umbellatum

Velvetleaf
Abutilon theophrasti

Wheat
Triticum aestivum

Witchgrass
Panicum capillare

*Apply 3 pints of this product per acre.

**Apply with hand-held equipment only.

Annual weeds will generally continue to germinate from seed throughout the growing season. Repeat treatments will be necessary to control later germinating weeds.

.2 Perennial Weeds

Apply a 3/4 to 1 1/2 percent solution of this product to control or destroy most vigorously growing perennial weeds. Add 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution to the rates of this product given in this list. See the "GENERAL INFORMATION," "DIRECTIONS FOR USE" and "MIXING AND APPLICATION" sections in this label for specific uses and application instructions.

Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment. When using hand-held equipment for low volume directed spot treatments, apply a 5 to 8 percent solution of this product.

Unless otherwise directed, allow at least 7 days after application before disturbing vegetation. If weeds have been mowed or tilled, do not treat until regrowth has reached the recommended stages. Fall treatments must be applied before a killing frost.

Repeat treatments may be necessary to control weeds regenerating from underground parts or seed.

When applied as recommended under the conditions described, this product plus surfactant WILL CONTROL the following PERENNIAL WEEDS:

Alfalfa
Medicago sativa

Alligatorweed*
Alternanthera philoxeroides

Anise/Fennel
Foeniculum vulgare

Artichoke, Jerusalem
Helianthus tuberosus

Bahiagrass
Paspalum notatum

Beachgrass, European
Ammophila arenaria

Bermudagrass
Cynodon dactylon

Bindweed, field
Convolvulus arvensis

Bluegrass, Kentucky
Poa pratensis

Blueweed, Texas
Helianthus ciliaris

Brackenfern
Pteridium spp.

Bromegrass, smooth
Bromus inermis

Canarygrass, reed
Phalaris arundinacea

Cattail
Typha spp.

Clover, red
Trifolium pratense

Clover, white
Trifolium repens

Cogongrass
Imperata cylindrica

Cordgrass
Spartina spp.

Cutgrass, giant*
Zizaniopsis miliacea

Dallisgrass
Paspalum dilatatum

Dandelion
Taraxacum officinale

Dock, curly
Rumex crispus

Dogbane, hemp
Apocynum cannabinum

Fescue
Festuca spp.

Fescue, tall
Festuca arundinacea

Guineagrass
Panicum maximum

Hemlock, poison
Conium maculatum

Horsenettle
Solanum carolinense

Horseradish
Armoracia rusticana

Ice Plant
Carprobrotus edulis

Ivy, German, cape
Senecio mikanoides
Delairea odorata

Johnsongrass
Sorghum halepense

Kikuyugrass
Pennisetum clandestinum

Knapweed, Russian
Centaurea repens

Lantana
Lantana camara

Lespedeza: common, sericea
Lespedeza striata
Lespedeza cuneata

Loosestrife, purple
Lythrum salicaria

Lotus, American
Nelumbo lutea

Maidencane
Panicum hematomon

Milkweed
Asclepias spp.

Muhly, wirestem
Muhlenbergia frondosa

Mullein, common
Verbascum thapsus

Napiergrass
Pennisetum purpureum

Nightshade, silverleaf
Solanum elaeagnifolium

Nutsedge:
purple
Cyperus rotundus
yellow
Cyperus esculentus

Orchardgrass
Dactylis glomerata

Pampasgrass
Cortaderia jubata

Paragrass
Brachiaria mutica

Pepperweed, perennial
Lepidium latifolium

Phragmites**
Phragmites spp.

Quackgrass
Agropyron repens

Reed, giant
Arundo donax

Ryegrass, perennial
Lolium perenne

Smartweed, swamp
Polygonum coccineum

Spatterdock
Nuphar luteum

Starthistle, yellow
Centaurea solstitialis

Sweet potato, wild*
Ipomoea pandurata

Thistle, artichoke
Cynara cardunculus

Thistle, Canada
Cirsium arvense

Timothy
Phleum pratense

Torpedograss*
Panicum repens

Tules, common
Scirpus acutus

Vaseygrass
Paspalum urvillei

Velvetgrass
Holcus spp.

Waterhyacinth
Eichornia crassipes

Waterlettuce
Pistia stratiotes

Waterprimrose
Ludwigia spp.

Wheatgrass, western
Agropyron smithii

*Partial control.

**Partial control in southeastern states. See specific recommendations below.

Alligatorweed—Apply 6 pints of this product per acre as a broadcast spray or as a 1 1/4 percent solution with hand-held equipment to provide partial control of alligatorweed. Apply when most of the target plants are in bloom. Repeat applications will be required to maintain such control.

Bermudagrass—Apply 7 1/2 pints of this product per acre as a broadcast spray or as a 1 1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and when seed heads appear.

Bindweed, field / Silverleaf Nightshade / Texas Blueweed—Apply 6 to 7 1/2 pints of this product per acre as a broadcast spray west of the Mississippi River and 4 1/2 to 6 pints of this product per acre east of the Mississippi River. With hand-held equipment, use a 1 1/2 percent solution. Apply when target plants are actively growing and are at or beyond full bloom. For silverleaf nightshade, best results can be obtained when application is made after berries are formed. Do not treat when weeds are under drought stress. New leaf development indicates active growth. For best results apply in late summer or fall.

Brackenfern—Apply 4 1/2 to 6 pints of this product per acre as a broadcast spray or as a 3/4 to 1 percent solution with hand-held equipment. Apply to fully expanded fronds which are at least 18 inches long.

Cattail—Apply 4 1/2 to 6 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when target plants are actively growing and are at or beyond the early-to-full bloom stage of growth. Best results are achieved when application is made during the summer or fall months.

Cogongrass—Apply 4 1/2 to 7 1/2 pints of this product per acre as a broadcast spray. Apply when cogongrass is at least 18 inches tall and actively growing in late summer or fall. Allow 7 or more days after application before tillage or mowing. Due to uneven stages of growth and the dense nature of vegetation preventing good spray coverage, repeat treatments may be necessary to maintain control.

Cordgrass—Apply 4 1/2 to 7 1/2 pints of this product per acre as a broadcast spray or as a 1 to 2 percent solution with hand-held equipment. Schedule applications in order to allow 6 hours before treated plants are covered by tidewater. The presence of debris and silt on the cordgrass plants will reduce performance. It may be necessary to wash targeted plants prior to application to improve uptake of this product into the plant.

Cutgrass, giant—Apply 6 pints of this product per acre as a broadcast spray or as a 1 percent solution with hand-held equipment to provide partial control of giant cutgrass. Repeat applications will be required to maintain such control, especially where vegetation is partially submerged in water. Allow for substantial regrowth to the 7- to 10-leaf stage prior to retreatment.

Dogbane, hemp / Knapweed / Horseradish—Apply 6 pints of this product per acre as a broadcast spray or as a 1 1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the late bud-to-flower stage of growth. For best results, apply in late summer or fall.

Fescue, tall—Apply 4 1/2 pints of this product per acre as a broadcast spray or as a 1 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained.

Guineagrass—Apply 4 1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when target plants are actively growing and when most have reached at least the 7-leaf stage of growth.

Johnsongrass / Bluegrass, Kentucky / Bromegrass, smooth / Canarygrass, reed / Orchardgrass / Ryegrass, perennial / Timothy / Wheatgrass, western—Apply 3 to 4 1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the boot-to-head stage of growth. When applied prior to the boot stage, less desirable control may be obtained. In the fall, apply before plants have turned brown.

Lantana—Apply this product as a 3/4 to 1 percent solution with hand-held equipment. Apply to actively growing lantana at or beyond the bloom stage of growth. Use the higher application rate for plants that have reached the woody stage of growth.

Loosestrife, purple—Apply 4 pints of this product per acre as a broadcast spray or as a 1 to 1 1/2 percent solution using hand-held equipment. Treat when plants are actively growing at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost.

Lotus, American—Apply 4 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Treat when plants are actively growing at or beyond the bloom stage of growth. Best results are achieved when application is made during summer or fall months. Fall treatments must be applied before a killing frost. Repeat treatment may be necessary to control regrowth from underground parts and seeds.

Maidencane / Paragrass—Apply 6 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Repeat treatments will be required, especially to vegetation partially submerged in water. Under these conditions, allow for regrowth to the 7- to 10-leaf stage prior to retreatment.

Milkweed, common—Apply 4 1/2 pints of this product per acre as a broadcast spray or as a 1 1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached the late bud-to-flower stage of growth.

Nutsedge: purple, yellow—Apply 4 1/2 pints of this product per acre as a broadcast spray, or as a 3/4 percent solution with hand-held equipment to control existing nutsedge plants and immature nutlets attached to treated plants. Apply when target plants are in flower or when new nutlets can be found at rhizome tips. Nutlets which have not germinated will not be controlled and may germinate following treatment. Repeat treatments will be required for long-term control.

Pampasgrass—Apply a 1 1/2 percent solution of this product with hand-held equipment when plants are actively growing.

Phragmites—For partial control of phragmites in Florida and the counties of other states bordering the Gulf of Mexico, apply 7 1/2 pints per acre as a broadcast spray or apply a 1 1/2 percent solution with hand-held equipment. In other areas of the U.S., apply 4 to 6 pints per acre as a broadcast spray or apply a 3/4 percent solution with hand-held equipment for partial control. For best results, treat during late summer of fall months when plants are actively growing and in full bloom. Due to the dense nature of the vegetation, which may prevent good spray coverage and uneven stages of growth, repeat treatments may be necessary to maintain control. Visual control symptoms will be slow to develop.

Quackgrass / Kikuyugrass / Muhly, wirestem—Apply 3 to 4 1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment when most quackgrass or wirestem muhly is at least 8 inches in height (3- to 4-leaf stage of growth) and actively growing. Allow 3 or more days after application before tillage.

Reed, giant / Ice Plant—For control of giant reed and ice plant, apply a 1 1/2 percent solution of this product with hand-held equipment when plants are actively growing. For giant reed, best results are obtained when applications are made in late summer to fall.

Spatterdock—Apply 6 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Apply when most plants are in full bloom. For best results, apply during the summer or fall months.

Sweet potato, wild—Apply this product as a 1 1/2 percent solution using hand-held equipment. Apply to actively growing weeds that are at or beyond the bloom stage of growth. Repeat applications will be required. Allow the plant to reach the recommended stage of growth before retreatment.

Thistle: Canada, artichoke—Apply 3 to 4 1/2 pints of this product per acre as a broadcast spray or as a 1 1/2 percent solution with hand-held equipment for Canada thistle. To control artichoke thistle, apply a 2 percent solution as a spray-to-wet application. Apply when target plants are actively growing and are at or beyond the bud stage of growth.

Torpedograss—Apply 6 to 7 1/2 pints of this product per acre as a broadcast spray or as a 3/4 to 1 1/2 percent solution with hand-held equipment to provide partial control of torpedograss. Use the lower rates under terrestrial conditions, and the higher rates under partially submerged or a floating mat condition. Repeat treatments will be required to maintain such control.

Tules, common—Apply this product as a 1 1/2 percent solution with hand-held equipment. Apply to actively growing plants at or beyond the seedhead stage of growth. After application, visual symptoms will be slow to appear and may not occur for 3 or more weeks.

Waterhyacinth—Apply 5 to 6 pints of this product per acre as a broadcast spray or apply a 3/4 to 1 percent solution with hand-held equipment. Apply when target plants are actively growing and at or beyond the early bloom stage of growth. After application, visual symptoms may require 3 or more weeks to appear with complete necrosis and decomposition usually occurring within 60 to 90 days. Use the higher rates when more rapid visual effects are desired.

Waterlettuce—For control, apply a 3/4 to 1 percent solution of this product with hand-held equipment to actively growing plants. Use higher rates where infestations are heavy. Best results are obtained from mid-summer through winter applications. Spring applications may require retreatment.

Waterprimrose—Apply this product as a 3/4 percent solution using hand-held equipment. Apply to plants that are actively growing at or beyond the bloom stage of growth, but before fall color changes occur. Thorough coverage is necessary for best control.

Other perennials listed on this label—Apply 4 1/2 to 7 1/2 pints of this product per acre as a broadcast spray or as a 3/4 to 1 1/2 percent solution with hand-held equipment. Apply when target plants are actively growing and most have reached early head or early bud stage of growth.

.3 Woody Brush and Trees

Apply a 1 to 2 percent solution of this product to control or partially control the woody brush and tree species listed below. Add 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution to the rates of this product given in this list. See the "GENERAL INFORMATION", "DIRECTIONS FOR USE" and "MIXING AND APPLICATION" sections in this label for specific uses and application instructions.

Ensure thorough coverage when using spray-to-wet treatments using hand-held equipment. When using hand-held equipment for low volume directed spot treatments, apply a 5 to 8 percent solution of this product.

When applied as recommended under the conditions described, this product plus surfactant CONTROLS or PARTIALLY CONTROLS the following woody brush plants and trees:

Alder
Alnus spp.

Ash*
Fraxinus spp.

Aspen, quaking
Populus tremuloides

Bearclover, Bearmat
Chamaebatia foliolosa

Birch
Betula spp.

Blackberry
Rubus spp.

Broom:
French
Cytisus monspessulanus

Scotch
Cytisus scoparius

Buckwheat, California*
Eriogonum fasciculatum

Cascara*
Rhamnus purshiana

Castor bean
Ricinus communis

Catsclaw*
Acacia greggi

Ceanothus
Ceanothus spp.

Chamise
Adenostoma fasciculatum

Cherry:

Bitter
Prunus emarginata

Black
Prunus serotina

Pin
Prunus pensylvanica

Cottonwood, eastern
Populus deltoides

Coyote brush
Baccharis consanguinea

Creeper, Virginia*
Parthenocissus quinquefolia

Cypress, swamp, bald
Taxodium distichum

Deerweed
Lotus scoparius

Dewberry
Rubus trivialis

Dogwood
Cornus spp.

Elderberry
Sambucus spp.

Elm*
Ulmus spp.

Eucalyptus, bluegum
Eucalyptus globulus

Gallberry
Ilex glabra

Hackberry, western
Celtis occidentalis

Hasardia*
Haplopappus squamosus

Hawthorn
Crataegus spp.

Hazel
Corylus spp.

Hickory
Carya spp.

Honeysuckle
Lonicera spp.

Hornbeam, American
Carpinus caroliniana

Huckleberry
Vaccinium spp.

Kudzu
Pueraria lobata

Locust, black*
Robinia pseudoacacia

Magnolia, sweetbay
Magnolia virginiana

Manzanita
Arctostaphylos spp.

Maple:
Red**
Acer rubrum

Sugar
Acer saccharum

Vine*
Acer circinatum

Monkey Flower*
Mimulus guttatus

Oak:
Black*
Quercus velutina

Northern pine
Quercus palustris

Post
Quercus stellata

Red
Quercus rubra

Southern red
Quercus falcata

White*
Quercus alba

Orange, Osage
Maclura pomifera

Peppertree, Brazilian—(Florida Holly)
Schinus terebinthifolius

Persimmon*
Diospyros spp.

Poison ivy
Rhus radicans

Poison Oak
Rhus toxicodendron

Poplar, yellow*
Liriodendron tulipifera

Prunus
Prunus spp.

Raspberry
Rubus spp.

Redbud, eastern
Cercis canadensis

Redcedar, eastern
Juniperus virginiana

Rose, multiflora
Rosa multiflora

Russian-olive
Elaeagnus angustifolia

Sage: black, white
Salvia spp.

Sagebrush, California
Artemisia californica

Salmonberry
Rubus spectabilis

Saltcedar, tamarisk*
Tamarix spp.

Saltbush, Sea myrtle
Baccharis halimifolia

Sassafras
Sassafras albidum

Sourwood*
Oxydendrum arboreum

Sumac:
Laurel*
Rhus toxicodendron

Poison*
Rhus vernix

Smooth*
Rhus glabra

Sugarbush*
Rhus ovata

Winged*
Rhus copallina

Sweet gum
Liquidambar styraciflua

Swordfern*
Polystichum munitum

Tallowtree, Chinese
Sapium sebiferum

Thimbleberry
Rubus parviflorus

Tobacco, tree*
Nicotiana glauca

Toyon*
Heteromeles arbutifolia

Trumpetcreeper
Campsis radicans

Waxmyrtle, southern*
Myrica cerifera

Willow
Salix spp.

Yerbasenia, California
Eriodictyon californicum

*Partial control

**See below for control or partial control instruction.

NOTE: If brush has been mowed or tilled or trees have been cut, do not treat until regrowth has reached the recommended stage of growth.

Apply the recommended rate of this product plus 2 or more quarts of a nonionic surfactant per 100 gallons of spray solution when plants are actively growing and, unless otherwise directed, after full-leaf expansion. Use the higher rate for larger plants and/or dense areas of growth. On vines, use the higher rate for plants that have reached the woody stage of growth. Best results are obtained when application is made in late summer or fall after fruit formation.

In arid areas, best results are obtained when application is made in the spring or early summer when brush species are at high moisture content and are flowering. Ensure thorough coverage when using hand-held equipment. Symptoms may not appear prior to frost or senescence with fall treatments.

Allow 7 or more days after application before tillage, mowing or removal. Repeat treatments may be necessary to control plants regenerating from underground parts or seed. Some autumn colors on undesirable deciduous species are acceptable provided no major leaf drop has occurred. Reduced performance may result if fall treatments are made following a frost.

See the "DIRECTIONS FOR USE" and "MIXING AND APPLICATION INSTRUCTIONS" sections in this label for labeled use and specific application instructions.

Applied as a 5 to 8 percent solution as a directed application as described in the "HAND-HELD AND HIGH-VOLUME EQUIPMENT" section, this product will control or partially control all species listed in this section of this label. Use the higher rate of application for dense stands and larger woody brush and trees.

Apply the product as follows to control or partially control the following woody brush and trees.

Alder / Blackberry / Dewberry / Honeysuckle / Oak, Post / Raspberry—For control, apply 4 1/2 to 6 pints per acre as a broadcast spray or as a 3/4 to 1 1/4 percent solution with hand-held equipment.

Aspen, Quaking / Hawthorn / Trumpetcreeper—For control, apply 3 to 4 1/4 pints of this product per acre as a broadcast spray or as a 3/4 to 1 1/4 percent solution with hand-held equipment.

Birch / Elderberry / Hazel / Salmonberry / Thimbleberry—For control, apply 3 pints per acre of this product as a broadcast spray or as a 3/4 percent solution with hand-held equipment.

Broom: French, Scotch—For control, apply a 1 1/4 to 1 1/2 percent solution with hand-held equipment.

Buckwheat, California / Hasardia / Monkey Flower / Tobacco, Tree—For partial control of these species, apply a 3/4 to 1 1/2 percent solution of this product as a foliar spray with hand-held equipment. Thorough coverage of foliage is necessary for best results.

Castorbean—For control, apply a 1 1/2 percent solution of this product with hand-held equipment.

Catsclaw—For partial control, apply a 1 1/4 to 1 1/2 percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Cherry: Bitter, Black, Pin / Oak, Southern Red / Sweet Gum / Prunus—For control, apply 3 to 7 1/2 pints of this product per acre as a broadcast spray or as a 1 to 1 1/2 percent solution with hand-held equipment.

Coyote brush—For control, apply a 1 1/4 to 1 1/2 percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Dogwood / Hickory / Salt cedar—For partial control, apply a 1 to 2 percent solution of this product with hand-held equipment or 6 to 7 1/2 pints per acre as a broadcast spray.

Eucalyptus, bluegum—For control of eucalyptus resprouts, apply a 1 1/2 percent solution of this product with hand-held equipment when resprouts are 6- to 12-feet tall. Ensure complete coverage. Apply when plants are actively growing. Avoid application to drought-stressed plants.

Kudzu—For control, apply 6 pints of this product per acre as a broadcast spray or as a 1 1/2 percent solution with hand-held equipment. Repeat applications will be required to maintain control.

Maple, Red—For control, apply as a 3/4 to 1 1/4 percent solution with hand-held equipment when leaves are fully developed. For partial control, apply 2 to 7 1/2 pints of this product per acre as a broadcast spray.

Maple, Sugar / Oak: Northern Pin, Red—For control, apply as a 3/4 to 1 1/4 percent solution with hand-held equipment when at least 50 percent of the new leaves are fully developed.

Peppertree, Brazilian (Holly, Florida) / Waxmyrtle, southern—For partial control, apply this product as a 1 1/2 percent solution with hand-held equipment.

Poison Ivy / Poison Oak—For control, apply 6 to 7 1/2 pints of this product per acre as a broadcast spray or as a 1 1/2 percent solution with hand-held equipment. Repeat applications may be required to maintain control. Fall treatments must be applied before leaves lose green color.

Rose, multiflora—For control, apply 3 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment. Treatments should be made prior to leaf deterioration by leaf-feeding insects.

Sage, black / Sagebrush, California / Chamise / Tallowtree, Chinese—For control of these species, apply a 3/4 percent solution of this product as a foliar spray with hand-held equipment. Thorough coverage of foliage is necessary for best results.

Saltbush, Sea myrtle—For control, apply this product as a 1 percent solution with hand-held equipment.

Willow—For control, apply 4 1/2 pints of this product per acre as a broadcast spray or as a 3/4 percent solution with hand-held equipment.

Other woody brush and trees listed in this label—For partial control, apply 3 to 7 1/2 pints of this product per acre as a broadcast spray or as a 3/4 to 1 1/2 percent solution with hand-held equipment.

.0 LIMIT OF WARRANTY AND LIABILITY

Monsanto Company warrants that this product conforms to the chemical description on the label and is reasonably fit for the purposes set forth in the Complete Directions for Use label booklet ("Directions") when used in accordance with those Directions under the conditions described therein. NO OTHER EXPRESS WARRANTY OR IMPLIED WARRANTY OF FITNESS FOR PARTICULAR PURPOSE OR MERCHANTABILITY IS MADE. This warranty is also subject to the conditions and limitations stated herein.

Buyer and all users shall promptly notify this Company of any claims whether based in contract, negligence, strict liability, other tort or otherwise.

Buyer and all users are responsible for all loss or damage from use or handling which results from conditions beyond the control of this Company, including, but not limited to, incompatibility with products other than those set forth in the Directions, application to or contact with desirable vegetation, unusual weather, weather conditions which are outside the range considered normal at the application site and for the time period when the product is applied, as well as weather conditions which are outside the application ranges set forth in the Directions, application in any manner not explicitly set forth in the Directions, moisture conditions outside the moisture range specified in the Directions, or the presence of products other than those set forth in the Directions in or on the soil, crop or treated vegetation.

This Company does not warrant any product reformulated or repackaged from this product except in accordance with this Company's stewardship requirements and with express written permission of this Company.

THE EXCLUSIVE REMEDY OF THE USER OR BUYER, AND THE LIMIT OF THE LIABILITY OF THIS COMPANY OR ANY OTHER SELLER FOR ANY AND ALL LOSSES, INJURIES OR DAMAGES RESULTING FROM THE USE OR HANDLING OF THIS PRODUCT (INCLUDING CLAIMS BASED IN CONTRACT, NEGLIGENCE, STRICT LIABILITY, OTHER TORT OR OTHERWISE) SHALL BE THE PURCHASE PRICE PAID BY THE USER OR BUYER FOR THE QUANTITY OF THIS PRODUCT INVOLVED, OR, AT THE ELECTION OF THIS COMPANY OR ANY OTHER SELLER, THE REPLACEMENT OF SUCH QUANTITY, OR, IF NOT ACQUIRED BY PURCHASE, REPLACEMENT OF SUCH QUANTITY. IN NO EVENT SHALL THIS COMPANY OR ANY OTHER SELLER BE LIABLE FOR ANY INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES.

Upon opening and using this product, buyer and all users are deemed to have accepted the terms of this LIMIT OF WARRANTY AND LIABILITY which may not be varied by any verbal or written agreement. If terms are not acceptable, return at once unopened.

EPA Reg. No. 524-343

In case of an emergency involving this product,
or for medical assistance,
Call Collect, day or night, (314) 694-4000.

Annual Report of the Nevada Irrigation District for the

Statewide General NPDES Permit for Discharges of Aquatic Pesticides to Surface Waters

The objectives of the monitoring plan were to:

1. Document compliance with the requirements of the General Permit.
2. Support the development, implementation and effectiveness evaluation of Best Management Practices (BMP).
3. Demonstrate the full restoration of water quality and protection of beneficial uses of the receiving waters following completion of pest control projects.
4. Identify and characterize aquatic pesticide application projects conducted by the discharger.
5. Assure that the plan provides for monitoring of projects that are representative of all pesticides and application methods used by the discharger.

The monitoring plan called for taking water samples at four sites where canal water treated with either a copper compound, glyphosate or acrolein is discharged into surface waters. Samples were taken both upstream and downstream of the discharge point.

Results of the laboratory test for those samples is contained in Appendix A. A review of the data revealed a potential quality control problem with the sample taken on the Gold Hill I Canal on September 25, 2002. It appears that the sample was contaminated somewhere in the process. As this was the last sample taken at this site during the 2002 treatment season, we were unable to pinpoint the cause of the high concentration relative to earlier samples, and take any corrective action.

Based on the test results for the samples taken, the concentrations of pesticides in the waters discharged were well within the label restrictions or directions concerning protection of water quality and beneficial uses. The results of the sampling program were reinforced by field assessments of each site both prior to and at the conclusion of the treatment.

Appendix A

Monitoring Data

Sample #	Date	Employee	Facility No.	Facility	County	Water Body	Location	Latitude	Longitude	Collection Method
10387-99-062502-01	6/25/02 1:00 PM	Early	10387	Riffle Box Canal	Nevada	Squirrel Creek	Upstream of discharge			Grab
10387-99-062502-10	6/25/02 1:05 PM	Early	10387	Riffle Box Canal	Nevada	Squirrel Creek	Downstream of discharge			Grab
10387-99-072302-01	7/23/02 1:31 PM	Early	10387	Riffle Box Canal	Nevada	Squirrel Creek	Upstream of discharge			Grab
10387-99-072302-10	7/23/02 1:29 PM	Early	10387	Riffle Box Canal	Nevada	Squirrel Creek	Downstream of discharge			Grab
10387-99-072902-01	7/29/02 10:35 AM	Early	10387	Riffle Box Canal	Nevada	Squirrel Creek	Upstream of discharge			Grab
10387-99-072902-10	7/29/02 10:30 AM	Early	10387	Riffle Box Canal	Nevada	Squirrel Creek	Downstream of discharge			Grab
10387-99-082002-01	8/20/02 12:34 PM	Early	10387	Riffle Box Canal	Nevada	Squirrel Creek	Upstream of discharge			Grab
10387-99-082002-10	8/20/02 12:28 PM	Early	10387	Riffle Box Canal	Nevada	Squirrel Creek	Downstream of discharge			Grab
10387-99-091702-01	9/17/02 1:10 PM	Early	10387	Riffle Box Canal	Nevada	Squirrel Creek	Upstream of discharge			Grab
10387-99-091702-10	9/17/02 1:05 PM	Early	10387	Riffle Box Canal	Nevada	Squirrel Creek	Downstream of discharge			Grab
10432-99-060502-01	6/5/02 12:55 PM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Gold Hill II Diversion			Grab
10432-99-060502-10	6/5/02 1:20 PM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Whiskey Diggins Diversion			Grab
10432-99-060502-75	6/5/02 1:10 PM	Early	10432	Gold Hill I	Placer	Deadman's Ravine				Grab
10432-99-070102-01	7/1/02 12:07 PM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Gold Hill II Diversion			Grab
10432-99-070102-10	7/1/02 12:50 PM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Whiskey Diggins Diversion			Grab
10432-99-072302-01	7/23/02 8:27 AM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Gold Hill II Diversion			Grab
10432-99-072302-10	7/23/02 9:00 AM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Whiskey Diggins Diversion			Grab
10432-99-073102-01	7/31/02 12:15 PM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Gold Hill II Diversion			Grab
10432-99-073102-10	7/31/02 12:45 PM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Whiskey Diggins Diversion			Grab
10432-99-082802-01	8/28/02 11:30 AM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Upstream of discharge			Grab
10432-99-082802-10	8/28/02 12:03 PM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Downstream of discharge			Grab
10432-99-092502-01	9/25/02 9:30 AM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Upstream of discharge			Grab
10432-99-092502-10	9/25/02 11:30 AM	Early	10432	Gold Hill I	Placer	Deadman's Ravine	Downstream of discharge			Grab
10472-99-061702-01	6/17/02 12:32 PM	Early	10472	Livingston	Placer	Sailor's Ravine	Upstream of discharge			Grab
10472-99-061702-01	7/15/02 1:24 PM	Early	10472	Livingston	Placer	Sailor's Ravine	Upstream of discharge			Grab
10472-99-061702-10	6/17/02 12:35 PM	Early	10472	Livingston	Placer	Sailor's Ravine	Downstream of discharge			Grab
10472-99-061702-10	7/15/02 12:45 PM	Early	10472	Livingston	Placer	Sailor's Ravine	Downstream of discharge			Grab
10472-99-081202-01	8/12/02 12:35 PM	Early	10472	Livingston	Placer	Sailor's Ravine	Upstream of discharge			Grab
10472-99-081202-10	8/12/02 12:40 PM	Early	10472	Livingston	Placer	Sailor's Ravine	Downstream of discharge			Grab
10472-99-082002-01	8/20/02 9:20 AM	Early	10472	Livingston	Placer	Sailor's Ravine	Upstream of discharge			Grab
10472-99-082002-10	8/20/02 9:18 AM	Early	10472	Livingston	Placer	Sailor's Ravine	Downstream of discharge			Grab
10472-99-091602-01	9/16/02 12:25 PM	Early	10472	Livingston	Placer	Sailor's Ravine	Upstream of discharge			Grab
10472-99-091602-10	9/16/02 12:20 PM	Early	10472	Livingston	Placer	Sailor's Ravine	Downstream of discharge			Grab
10491-99-080702-01	8/7/02 4:45 PM	Early	10491	Auburn Ravine I	Placer	Doty Ravine	Upstream of discharge			Grab
10491-99-080702-10	8/7/02 4:50 PM	Early	10491	Auburn Ravine I	Placer	Doty Ravine	Downstream of discharge			Grab
10491-99-090402-01	9/4/02 5:00 PM	Early	10491	Auburn Ravine I	Placer	Doty Ravine	Upstream of discharge			Grab
10491-99-090402-10	9/4/02 5:15 PM	Early	10491	Auburn Ravine I	Placer	Doty Ravine	Downstream of discharge			Grab

Sample #	Analyte	Analysis Date	Sample Type	Method	MDL	Concentration ppb	Surrogate	Laboratory
10387-99-062502-01	Copper	7/2/02	Whole Water	200.7	10	ND		Cranmer
10387-99-062502-10	Copper	7/2/02	Whole Water	200.7	10	ND		Cranmer
10387-99-072302-01	Copper	8/4/02	Whole Water	200.7	10	ND		Cranmer
10387-99-072302-10	Copper	8/4/02	Whole Water	200.7	10	ND		Cranmer
10387-99-072902-01	Glyphosate	8/19/02	Whole Water	547	25	ND	108.1	BSK/Zymax
10387-99-072902-10	Glyphosate	8/19/02	Whole Water	547	25	ND	116	BSK/Zymax
10387-99-082002-01	Copper	9/3/02	Whole Water	200.7	10	16		Cranmer
10387-99-082002-10	Copper	9/3/02	Whole Water	200.7	10	22		Cranmer
10387-99-091702-01	Copper	10/2/02	Whole Water	200.7	10	19		Cranmer
10387-99-091702-10	Copper	10/2/02	Whole Water	200.7	10	28		Cranmer
10432-99-060502-01	Copper	6/18/02	Whole Water	200.7	10	ND		Cranmer
10432-99-060502-10	Copper	6/18/02	Whole Water	200.7	10	17		Cranmer
10432-99-060502-75	Copper	6/18/02	Trip Blank	200.7	10	ND		Cranmer
10432-99-070102-01	Copper	7/18/02	Whole Water	200.7	10	ND		Cranmer
10432-99-070102-10	Copper	7/18/02	Whole Water	200.7	10	12		Cranmer
10432-99-072302-01	Glyphosate	8/19/02	Whole Water	547	25	ND	107.5	BSK/Zymax
10432-99-072302-10	Glyphosate	8/19/02	Whole Water	547	25	ND	109.6	BSK/Zymax
10432-99-073102-01	Copper	8/11/02	Whole Water	200.7	10	11		Cranmer
10432-99-073102-10	Copper	8/11/02	Whole Water	200.7	10	21		Cranmer
10432-99-082802-01	Copper	10/2/02	Whole Water	200.7	10	ND		Cranmer
10432-99-082802-10	Copper	10/2/02	Whole Water	200.7	10	17		Cranmer
10432-99-092502-01	Copper	10/1/02	Whole Water	200.7	10	158		Cranmer
10432-99-092502-10	Copper	10/1/02	Whole Water	200.7	10	163		Cranmer
10472-99-061702-01	Acrolein	6/20/02	Whole Water	8260B	50	ND		CRL
10472-99-061702-01	Acrolein	7/29/02	Whole Water	8260B	5	ND	100	BSK/Zymax
10472-99-061702-10	Acrolein	6/20/02	Whole Water	8260B	50	ND		CRL
10472-99-061702-10	Acrolein	7/29/02	Whole Water	8260B	5	ND	100	BSK/Zymax
10472-99-081202-01	Acrolein	8/21/02	Whole Water	8260	0.5	ND	101	Zymax
10472-99-081202-10	Acrolein	8/21/02	Whole Water	8260	0.5	ND	99	Zymax
10472-99-082002-01	Glyphosate	9/24/02	Whole Water	547	25	ND	94.8	BSK
10472-99-082002-10	Glyphosate	9/24/02	Whole Water	547	25	ND	92.8	BSK
10472-99-091602-01	Acrolein	9/28/02	Whole Water	8260	5	ND	88	Zymax
10472-99-091602-10	Acrolein	9/28/02	Whole Water	8260	5	ND	90	Zymax
10491-99-080702-01	Acrolein	8/15/02	Whole Water	8260	0.5	ND	93	Zymax
10491-99-080702-10	Acrolein	8/15/02	Whole Water	8260	0.5	ND	96	Zymax
10491-99-090402-01	Acrolein	9/12/02	Whole Water	8260	5	ND	97	Zymax
10491-99-090402-10	Acrolein	9/12/02	Whole Water	8260	5	ND	99	Zymax

Nevada Irrigation District
Aquatic Weed Management Program
Mitigation Monitoring Plan

	Conditions of Approval / Mitigation Measure	Timing / Implementation	Enforcement / Monitoring
Biological Resources			
1.	**California Red-Legged Frog (*Rana aurora draytonii*) and Foothill Yellow-Legged Frog (*Rana boylii*)** California red-legged frog (*Rana aurora draytonii*) is endemic to California and Baja California, Mexico. CRLF are federally listed as threatened and are a state species of concern. They utilize a variety of habitats including various aquatic, riparian, and upland habitats below 5,200 feet (Jennings & Hayes, 1994); nearly all sightings have occurred below 3,500 feet (USFWS, 2002). Although the use of upland habitats by CRLF is not well understood, during periods of wet weather, this species is known to make movements through upland habitats (USFWS, 2002). CRLF rarely occur far from water during dry periods. Deep (greater than 2 feet) still or slow moving water and dense, shrubby riparian or emergent vegetation is necessary for the deposition of eggs (USFWS, 2002). Foothill yellow-legged frogs (*Rana boylii*) are federal species of concern and state species of	Pre-application surveys will be conducted in those areas most likely to have occurrences of either the California Red-Legged Frog or Foothill Yellow-Legged Frog. These surveys will be conducted prior to the application of any herbicides into canals or waterways operated by Nevada Irrigation District (NID) to determine the presence/absence of either species. In the event that either frog species is observed in area, no herbicide applications will take place.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.

	concern that inhabit perennial streams with cobble substrate. FYLF may possibly occur in the waterways within the affected environment.		
2.	Northwestern Pond Turtle (*Clemmys marmorata marmorata*) The western pond turtle (*Clemmys marmorata*) occurs from the vicinity of the American River in California northward to the lower Columbia River in Oregon and Washington. Northwestern pond turtles are habitat generalists and occur in a wide variety of permanent or nearly permanent aquatic habitats, normally ponds, lakes, streams and irrigation ditches, with basking sites such as partially submerged logs, rocks, mats of floating vegetation, or open mud banks (Zeiner et al., 1988). Aquatic sites are usually left to reproduce, aestivate, and overwinter in upland habitats such as annual grasslands and oak woodlands (Jennings & Hayes 1994).	Pre-application surveys will be implemented in those areas most likely to have occurrences of NW pond turtles. To reduce direct impacts to NW pond turtles, herbicides will not be used in those areas of occurrence.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.
3.	**Listed and Special-Status Fish Species** Chinook and steelhead are salmonids found in some tributaries of the Sacramento and American Rivers. They may occasionally occur in canal systems to which they have	Pre-application surveys will be implemented in those areas most likely to have occurrences of salmonids. To reduce direct impacts to salmonids,	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.

	access, and potentially be affected by herbicide levels in those canals systems.	herbicides will not be used in those areas of occurrence. In canals where acrolein is used the waters will held for a minimum of 6 days prior to release into natural waterways. Acrolein treated water may be released sooner for agricultural irrigation as long as it does not intercept natural waterways.	
4.	**Listed and Special-Status Invertebrate Species** Valley elderberry longhorn beetle may occur in riparian areas in their host plant, *Sambucus mexicanus*.	Elderberry shrubs located in the vicinity of canals that receive herbicide applications will be inventoried and mapped. No glyphosate will be used within 50 feet of these shrub locations.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.
Hydrology and Water Quality			
5.	NID's goal is to adhere to the water quality standards and discharge requirements of the CWA as they pertain to herbicide applications into the waters of the United States. Proposed activities of this project have the potential to violate these requirements if the recommended label requirements are not strictly adhered to Herbicides will only be applied by licensed	Continuous throughout the life of the Aquatic Weed Management Program.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.

	applicators in a manner consistent with the label requirements.		
6.	Discharges of waters treated with herbicides to natural stream systems will be avoided where possible and otherwise minimized. Canals treated with acrolein will be held for a minimum of 6 day prior to being released into natural water bodies. Acrolein treated water may be released sooner if released directly for agricultural irrigation and will not intercept natural waterways.	Continuous throughout the life of the Aquatic Weed Management Program.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.
7.	Ambient levels of alkalinity will be monitored and the application rates (and resultant concentrations of herbicides that contain copper) will be decreased to minimize potential toxic impacts. When the receiving natural waterbody flows are low, calcium carbonate ($CaCO_3$) will be added to the water prior to discharge.	Alkalinity data will be collected prior to all copper based herbicide applications. When receiving waterbody flows are low, calcium carbonate will be added to the discharged water. This will raise the existing alkalinity in the treated water and reduce the toxicity of the copper in the receiving waters to a less than significant level.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.
8.	The minimum effective amounts of herbicides will be applied to minimize potential water quality impacts.	A survey of aquatic weed density will be conducted prior to applications of aquatic herbicide applications to determine minimum concentration needed to control vegetation.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.

9.	Discharges of waters treated with sulfate compounds to natural waterways will be avoided. This will prevent the loading of sulfate to waterways with sediments contaminated with mercury.	Continuous throughout the life of the Aquatic Weed Management Program.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.
10.	Discharges of waters treated with herbicides to water treatment plants will be avoided.	Continuous throughout the life of the Aquatic Weed Management Program.	NID Herbicide Applicators and Aquatic Weed Management Maintenance personnel.