

# PYRETHROID MANAGEMENT PLAN

For the CITY OF DIXON



PREPARED BY:

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## **1. INTRODUCTION**

Central Valley Regional Water Quality Control Board (CVRWQCB) Resolution R5-2017-0057 established a Pyrethroid Pesticides Control Program (Basin Plan Amendment) to control the discharges of pyrethroid pesticide throughout the Sacramento and San Joaquin River Basins for the protection of aquatic life beneficial uses. In addition, Resolution R5-2017-0057 established monitoring requirements for Municipal Separate Storm Sewer Systems (MS4s) to conduct baseline monitoring, and specified that the Executive Officer may issue 13267 and/or 13383 orders to meet these requirements. Discharges to Waters of the United States from MS4s have been found by the CVRWQCB to be a source of pyrethroid pesticides to surface waters within the Sacramento and San Joaquin River Basins. The City of Dixon (City) is a permitted MS4 discharger within the geographic scope of the Pyrethroids Control Program, and on 13 July 2020 was issued an Order to Submit Technical and Monitoring Reports Pursuant to California Water Code Sections 13267 and 13383.

Pursuant to Water Code Sections 13267 and 13383, the City is required to submit the following technical and monitoring reports: Monitoring Plan or commitment to develop a Pyrethroid Management Plan (PMP). The City has chosen to prepare a PMP instead of conducting baseline monitoring and reporting, by acknowledging that existing pyrethroid concentration data for the Sacramento and San Joaquin River Basins frequently exceed water quality standards, and is representative of discharges from the City.

### **1.1 PYRETHROID MANAGEMENT PRACTICES**

This PMP has been prepared in accordance with the CVRWQCB Resolution R5-2017-005 for MS4s. The purpose and objective of this PMP is to identify a set of management practices that, taken as a whole, may be reasonably expected to effectively reduce pyrethroid levels in discharges by the City, to the maximum extent practicable, and to consider whether there are potential water quality concerns with replacement insecticide products.

This PMP has been organized as follows:

#### **Section 1. Introduction**

#### **Section 2. Education and Outreach Activities**

#### **Section 3. Pesticide Pollution Prevention Activities**

#### **Section 4. Support of Pollution Prevention through the Pesticide Regulatory Process**

## 2.0 EDUCATION AND OUTREACH ACTIVITIES

The Pyrethroid Pesticide Basin Plan Amendment requires the general public to implement best management practices (BMPs) to control urban pesticide discharges, including education and outreach activities. These BMPs include:

- Undertake targeted outreach programs
- Make available point-of-purchase outreach materials to retailers
- Conduct outreach to City's residents and businesses
- Encourage public and private management practices

### 2.1 Targeted Outreach Programs for Communities

The Pyrethroid Pesticide Basin Plan Amendment states:

*Undertake targeted outreach programs to encourage communities within a discharger's jurisdiction to reduce their reliance on pesticides that threaten water quality, focusing efforts on those most likely to use pesticides that threaten water quality, potentially by working with DPR, County Agricultural Commissioners, and the University of California Statewide Integrated Pest Management Program, or other entities as appropriate.*

The City will develop and implement targeted outreach programs that convey messages to the residents and community specific to the proper use and application of pesticides, as well as encourage the use of less toxic options to help reduce reliance on pesticides that threaten water quality within the basin. The targeted outreach activities that will be implemented by the City will include the following:

- **Website** – The City website provides design guidelines for stormwater compliance including tips for reducing and controlling stormwater runoff, implementation of BMPs for pesticides and other pollutants, and other strategies for protecting water quality. The website also includes a video link about designing to reduce stormwater runoff, and provides and other stormwater pollution prevention videos. The website will be updated to include links to pesticide-related information and options for less toxic methods of pest control, as well as links to the Integrated Pest Management (IPM) Principles webpage, and the University of California Statewide Integrated Pest Management Program (UC IPM) for further information.
- **Household Hazardous Waste** – The City supports public participation in Yolo County's Household Hazardous Waste program to encourage proper pesticide disposal. A link to Yolo County's Household Hazardous Waste Program will be added to the City's website.
- **Social Media** – The City will utilize social media platforms such as Facebook, Instagram and/or Nextdoor to disseminate news, advertise community events and workshops, and share other outreach information as needed.

- **Residential/Community Outreach** – The City participates in regional outreach efforts through mixed media advertising campaigns (radio, TV, bus and bench ads, etc.), providing outreach material at community events, and/or hosting outreach events. These events are designed to engage the public in conversations about the importance of protecting our communities from the hazards of pesticides and runoff that can occur by misusing or over applying pesticides and fertilizers.

## 2.2 Point-of-Purchase Outreach Materials

The Pyrethroid Pesticide Basin Plan Amendment requires the following point-of-purchase outreach activity:

*Make available point-of-purchase outreach materials to pesticide retailer(s) in or near the City's jurisdiction. These materials shall provide targeted information on proper pesticide use and disposal, potential adverse impacts on water quality, and less toxic methods of pest prevention and control.*

The City will develop and implement an approach to provide point-of-purchase outreach materials to local pesticide retailers that convey messages to the community specific to the proper use, storage, and disposal of pesticides; potential adverse effects on water quality; and less toxic methods of pest control. The City will contract with Our Water – Our World (OWOW), a statewide program specifically designed to address these topics. The purpose of OWOW program is to raise awareness of the connection between pesticide use and water quality and provide information to consumers at the point-of-purchase about integrated pest management (IPM) and less-toxic alternatives that are not causing water quality problems. OWOW provides outreach at multiple local stores, and is responsible for setting up and maintaining in-store racks containing OWOW outreach materials. These materials and literature provide customers with pertinent information regarding the potentially adverse impacts of pesticides on water quality; discuss proper pesticide use, storage and disposal; and present less toxic methods of pest control. In addition to maintaining in-store outreach materials, the OWOW program provides an IPM Advocate who shares relevant IPM information with store staff and customers during service visits. In addition to OWOW material, the IPM Advocate provides UC-IPM newsletters for retail nurseries and garden centers on invasive and seasonal pests and how to manage them using IPM. Additional information is available on the [OWOW website http://ourwaterourworld.org/](http://ourwaterourworld.org/).

The City does not have authority to require retailers to accept the proposed outreach program and materials, so the number of stores participating is dependent on decisions made by the store management. However, the City will place and maintain outreach materials in a minimum target of 5 stores that sell pesticides (e.g., Ace Hardware, Tractor Supply Company).

### 2.3 Outreach to City's Residents and Businesses for Structural Pest Control and Landscape Professionals

This education and outreach program activity requires the City to:

*Conduct outreach to residents and businesses who may hire structural pest control and landscape professionals that contains messages that (a) explain the links between pesticide usage and water quality; and (b) provides information about structural pest control IPM certification programs and IPM for landscape professionals.*

The City will develop and provide pesticide-related outreach to residents and businesses who may hire structural pest control and/or landscape professionals. The outreach to pest control and landscape professionals that will be implemented by the City includes the following:

- **Website** – In addition to the website information presented in Section 2.1 Website, the City will provide pesticide-specific outreach to residents and businesses on its website (e.g. City News, Engineering Department, and Water Department). The website will include links to pesticide-related information, including:
  - Information through OWOW on *Finding a Company That Can Prevent Pest Problems*, information about the “*Green Gardener*” Program, and information on *Alternative Products*, which includes a list of products that are considered to be non-toxic or less toxic alternatives to conventional pesticides.
  - The City website will provide a link to the UC IPM program (<http://ipm.ucanr.edu/PMG/PESTNOTES/pn74125.html>) which includes a web page on hiring a pest control company.
  - A Landscaping BMP Fact sheet will be provided for businesses (i.e., industrial and commercial facilities) for consideration when hiring structural pest control and/or landscape professionals.
- **Coordinated Outreach** – The City will coordinate with specific departments and divisions (e.g. City News, Engineering and Water) to provide residents and businesses who may hire structural pest control and/or landscape professionals outreach newsletters. The newsletters will be distributed bi-monthly and include pesticide and IPM outreach services and information.
- **Social Media** – The City will utilize social media platforms such as Facebook, Instagram, and/or Nextdoor to disseminate the newsletters, advertise community events and workshops, and share other outreach information as needed.

### 2.4 Encourage Public and Private Management Practices

The Pyrethroid Pesticides Control Program (BPA) requires the following outreach activity for landscape design and irrigation management practices:

*Encourage public and private management practices (e.g., landscape design, irrigation management, etc.) that minimize pesticide runoff.*

The City has developed, and/or will develop, information to be conveyed specific to landscape design and irrigation management that minimize pesticide runoff. The outreach for landscape and irrigation management activities that is, or will be, implemented by the City includes the following:

- **Outreach Materials** – Through its point-of-purchase outreach (**Section 2.2**) at local retail stores, the City will distribute the OWOW fact sheet on *Tips for a Beautiful, Healthy Lawn* that includes tips for planting a new, drought tolerate lawn; caring for an established lawn; dealing with weeds; and restoring a lawn to health.
- **Website** –The City will provide irrigation tips on its website regarding when to water your lawn, and winter and summer watering tips.
- **Coordinated Outreach** – The City will coordinate with specific departments (e.g. City News, Engineering and Water) to provide tips, advice and information for landscape design and irrigation management practices. This information will be provided in the City’s bi-monthly newsletter.
- **Social Media** – The City will utilize social media platforms such as Facebook, Instagram, and/or Nextdoor to disseminate the newsletters, advertise community events and workshops, and share outreach such as irrigation practices and landscape design to minimize pesticide runoff.
- **Community Workshops** – The City will provide semi-annual irrigation workshops to residents and community.

### **3.0 PESTICIDE POLLUTION PREVENTION ACTIVITIES**

The Pyrethroid Pesticides Control Program (BPA) includes multiple pollution prevention activities for public agencies that reduce reliance on pesticides that adversely impact water quality. The City currently employs some of these pollution prevention activities, and will implement new BMP measures to ensure the protection of water quality including:

- Reducing Reliance on Pyrethroids and other Pesticides, and
- Developing and implementing an Integrated Pest Management (IPM) policy

#### **3.1 Reducing Reliance on Pyrethroids and other Pesticides**

The Pyrethroid Pesticides Control Program (BPA) requires the following practices to reduce pesticide use:

*Reduce reliance on pyrethroids and other pesticides that threaten water quality by adopting and implementing policies or procedures that minimize the use of pesticides that threaten water quality in the discharger's operations and on the discharger's property.*

The City will develop and implement a program to reduce reliance on pyrethroids and other pesticide use. The program will include landscape design and landscape maintenance program tips, advice and information to reduce the amount of water, pesticides, herbicides, and fertilizers used on City-owned or operated facilities, including park sites, landscaped medians, open space, rights-of-way, and other landscaped areas.

The following practices that will be employed to reduce the reliance on pesticide use will include the following:

- Adoption and Implementation of Procedures and/or Policies to Minimize the Use of Pesticides: The City will implement practices that reduce the discharge of pesticides to the stormwater conveyance system and/or surface water bodies by:
  - Providing educational activities for City contracted applicators and distributors. In addition, the City will implement contracting requirements for municipal pest control applicators.
  - The City will implement purchasing specifications for pesticides used within City property, which considers the least-toxic options.
  - The City will implement landscape management measures that rely on non-chemical solutions.
- IPM Policy – The City's proposed IPM Policy is described in Section 3.2. Develop and implement an Integrated Pest Management (IPM) policy.

### 3.2 Develop and implement an Integrated Pest Management (IPM) policy

The Pyrethroid Pesticides Control Program (BPA) requires the following activities to develop and implement an IPM policy:

- *Is consistent with IPM as defined by the University of California Statewide IPM Program (UC-IPM) or the California Structural Pest Control Board definition.*
- *Applies to all Permittee staff (City) who conduct or contract for pest management and to pest management vendors under contract to the Permittee (City).*
- *Assigns responsibilities to a designated staff position and/or department to coordinate Permittee (City) activities and ensure that the IPM policy is implemented.*

At this time, the City has not developed and/or implemented an IPM policy. However, in compliance with the Pyrethroid Pesticides Control Program (BPA), the City will adopt and enforce

an IPM Policy to promote the use of IPM and minimize the use of pesticides within its jurisdiction.

The IPM Policy will be:

- Consistent with IPM as defined by the University of California Statewide IPM Program (UC-IPM) or the California Structural Pest Control Board definition.
- Applies to all City staff who conduct or contract for pest management and to pest management vendors under contract to the City.
- Assigns responsibilities to a designated staff position and/or department within the City of Dixon to coordinate the City's activities and ensure that the IPM policy is implemented.

#### **4.0 SUPPORT OF POLLUTION PREVENTION THROUGH THE PESTICIDE REGULATORY PROCESS**

The Pyrethroid Pesticides Control Program (BPA) requires pollution prevention through participation in a pesticide regulatory process. Some of these processes can be accomplished through organizations such as the California Stormwater Quality Association (CASQA), which coordinates with the California Department of Pesticide Regulation (CDPR) and other organizations taking actions to protect water quality from the use of pesticides in the urban environment. The BPA requires the following:

*Track USEPA and DPR pesticide evaluation and registration activities as they relate to surface water quality and encourage these agencies to accommodate urban water quality concerns within their pesticide registration processes. This may include assembling and submitting available information (such as monitoring data) to USEPA and DPR during public comment period to assist in their pesticide evaluation and registration activities. This best management practice would be implemented most effectively through a cooperative regional or statewide approach.*

The City is a member of and participates in the CASQA, and currently has a link on the City website to the CASQA Stormwater Best Management Practices Handbook. The purpose of the handbook is to provide general guidance for selecting and implementing Best Management Practices for pollution prevention in newly developed areas and redeveloped areas to waters of the state. The handbook also provides guidance on developing project-specific stormwater management plans including selection and implementation of BMPs for a particular development or redevelopment project.

The City will meet the requirements of this section by continuing to provide financial support for CASQA, that track *USEPA and DPR* pesticide evaluation and registration activities to encourage agencies to accommodate urban water quality concerns within their pesticide registration processes. The City may also support a Delta Regional Monitoring Program in an effort to monitor and report on pesticide trends in downstream receiving waterways. City staff and consultants may also participate and assist in activities such as the following:



- Assembling and submitting any monitoring data collected that can be utilized by USEPA and DPR to assist during pesticide evaluation and registration activities,
- Developing and maintaining a Pesticide Watch List to focus attention on pesticides in the urban environment that impact aquatic life beneficial uses,
- Monitoring of Federal Register notices for relevant regulatory actions,
- Writing letters to and meeting with DPR and Office of Pesticide Programs on high priority regulatory actions, and
- Reviewing relevant agency reports and scientific literature.

## **RESOURCES and REFERENCES**

**Portions of this Pyrethroid Management Plan have been adopted from the following documents:**

California Stormwater Quality Association, Stormwater Best Management Practice Handbook – New Development and Redevelopment, January 2003.

Order to Submit Technical and Monitoring Reports Pursuant to California Water Code Sections 13267 and 13383, Central Valley Regional Water Quality Control Board, 13 July 2020.

Pyrethroid Management Plan, Sacramento Stormwater Quality Partnership, October 2020 Revision.

Pyrethroid Management Plan and Monitoring Approach, City of Roseville, Larry Walker Associates, October 2020.

Resolution R5-2017-0057, Amendment to the Water Quality Control Plan for the Sacramento River and San Joaquin River Basins for the Control of Pyrethroid Pesticide Discharges, Central Valley Regional Water Quality Control Board, 8 June 2017.

# INTEGRATED PEST MANAGEMENT POLICY

For the CITY OF DIXON



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## 1. INTRODUCTION

The Integrated Pest Management (IPM) policy is a comprehensive approach to managing pests intended to minimize the impact on human health and the environment while still effectively controlling pests. The IPM considers a variety of pest control techniques while preferentially implementing the use of non-chemical methods. This IPM policy shall apply to all pest control activities by the City of Dixon, including activities at public buildings and facilities, grounds and open space, and other property managed by the City of Dixon.

Key components of the IPM policy are:

- **Prevention:** The IPM aims to prevent pest problems before they occur. This can be achieved through measures such as sanitation practices, exclusion techniques, and education programs for residents.
- **Monitoring:** Regular monitoring is necessary to detect and identify pest problems early.
- **Thresholds:** The IPM policy sets thresholds for pest populations that trigger control actions. As a part of the IPM program, pesticides may be used when pest thresholds get too high.
- **Control Measures:** The IPM promotes the use of non-chemical control measures such as physical, biological, and cultural methods. Pesticides are used only as a last resort and are chosen based on their effectiveness, safety, and environmental impact.
- **Record Keeping:** The IPM policy includes a record-keeping system to track pest activity, control measures taken, and the effectiveness of those measures. This information can be used to refine the IPM program over time.
- **Training:** All personnel involved in implementing the IPM policy, including city employees and contractors, shall receive training in the principles and techniques of IPM.
- **Communication:** The City of Dixon shall communicate regularly with the public about the IPM policy, and the steps being taken to control pests. This may involve public meetings, educational materials, and other forms of outreach.

This IPM has been organized as follows:

### Section 1. Introduction

### Section 2. Scope and Objectives

### Section 3. Roles and Responsibilities

**Section 4. Pest Monitoring and Identification**

**Section 5. Thresholds**

**Section 6. Control Strategies**

**Section 7. Pesticide Use and Management**

**Section 8. Record Keeping and Reporting**

**Section 9. Public Education and Outreach**

**Section 10. Evaluation and Review**

**Section 11. Conclusion**

**2.0 SCOPE AND OBJECTIVES**

The IPM Policy shall apply to all pest control activities conducted by the City of Dixon, including activities at public buildings and related facilities; grounds and open space; urban forestry, and other property owned or managed by the City of Dixon and conducted by City staff and/or contractors. It is expected that all pest management on City property will adhere to industry best practices, reduce or eliminate pesticide applications to the maximum extent practicable, and include all reasonable measures to protect human and environmental health. It is further expected that all City employees monitoring or treating pest problems, or managing contractors who are conducting IPM activities on the City's behalf, be familiar with the content and principles of the policy, receive on-going annual training, provide accurate, well-documented records and conduct annual evaluations of the IPM program and practices. The City of Dixon IPM program sets forth the following objectives:

Citywide Pest Management Guiding Principles & Goals

- Use of organic pesticides in all City properties.
- Limit exposure to any pesticides where children and the general public congregate.
- Incorporate additional guidance on use of pesticides for City rights of way, facilities, and other properties.
- Use Environmental Protection Agency (EPA) Level pesticides in a targeted manner, and only if deemed necessary to protect public health and economic loss by a licensed pest control advisor and City staff, when pests cannot be managed by other methods.
- Comply with requirements in the City of Dixon's stormwater NPDES permit.
- Comply with requirements in the City of Dixon's Pyrethroid Pesticides Control Program (Basin Plan Amendment (BPA)).

- Promote transparency of the City of Dixon’s pest management actions.
- Use pesticide risk assessment guidelines employed by the City of Dixon (adopted from the City of San Francisco’s Department of the Environment) to create and annually maintain a list of reduced-risk pesticides, and associated limitations for use, which may be applied as necessary within the City of Dixon;
- Increase public awareness of IPM.

## **Definitions**

Biological Control - Biological technologies to manage unwanted pests.

Chemical Control - The use or application of a chemical pesticide (green or conventional) to manage pests.

Contractor - A person, firm, corporation, or other entity, including a governmental entity, which enters into a contract with the City of Dixon.

Cultural Control - The practice of modifying the growing environment to reduce the prevalence of unwanted pests.

Green Pesticide - A material that is generally considered to have minimal adverse environmental or chronic health and safety impacts.

IPM - A decision-making process that analyzes, selects, and implements pest control strategies to prevent or control pest populations. IPM uses a “whole systems” approach that employs monitoring and extensive knowledge about pests, such as infestation thresholds, life histories, environmental requirements, and natural enemies to compliment and facilitate biological, cultural, mechanical and other natural control of pests. Chemical control methods are considered only when necessary.

Mechanical Control - Utilizes hand labor or equipment such as mowers, graders, weed-eaters, and chainsaws. Crack and crevice sealants and closing small entryways (e.g., around pipes and conduits) into buildings for insect and rodent management would also be mechanical methods.

Pest - Fungus, insect, nematode, rodent, weed, or other form of terrestrial or aquatic life form that is injurious to human or farm animal health, or interferes with economic activities such as agriculture, public utilities, and landscaping.

Pesticide - Any substance, or mixture of substances, used for defoliating plants, regulating plant growth, or for preventing, destroying, repelling, or mitigating any pest, which may be detrimental to vegetation, humans, animals, or structures.

Reasonable Alternative - A feasible option for pest control that takes into account the environmental, economic, and social costs and benefits of the proposed choices.

Reduced-Risk Pesticide - A material which has been assessed and identified as having a reduced hazard and exposure risk using a ranking system, best available science, and technical advisory body vetting.

QAC - Qualified Applicators Certificate authorizes an individual to apply pesticides according to Title 3, Article 3 of the California Code of Regulations. Applications may include residential, industrial, institutional, landscape, and right-of-way sites.

### **Section 3. Roles and Responsibilities**

#### **Pest Management Coordinator (PMC)**

The City of Dixon will employ/designate Pest Management Coordinator to monitor and assess pest populations, advise and oversee citywide IPM planning and pest management activities and contracts, and keep record of and report on city IPM activities. The Pest Management Coordinator will periodically review an IPM Program, which will apply to all City of Dixon pest management activities.

Responsibilities of the PMC shall include, but are not limited to, the following:

- Coordinate with City departments on weed and pest control issues.
- Ensure that all City IPM activities adhere to local, county, state, and federal regulations.
- Record keeping, regulatory reporting and preparation and publication of the City's annual IPM report.
- Assist with post-treatment monitoring/ evaluation.
- Assist City departments with staff and contractor training needs.
- Outreach to citizens regarding IPM.
- Coordinate volunteer weed management projects.
- Maintain applicable license(s) with state and county regulators.

#### **City Department Staff**

Different City departments will have responsibilities related to pest management, such as parks and recreation, public works, and sanitation. Staff in these departments are responsible for implementing the City of Dixon's IPM practices in their respective areas of operation, including monitoring for pest presence, identifying pest problems, and applying appropriate pest management strategies.

The following departments/divisions and their contractors conduct pest control operations:

- Park Facilities (Parks, playgrounds and greenbelts)
  - Southwest Park, Hall Park, All Weather Turf Field, Dog Parks, Pat Granucci Aquatics Center, Northwest Park, Patwin Park, Conejo Park, Linear Path, Veterans Park, and Women's Improvement Club Park

- Public Works Department
  - Transportation (Roadside weed abatement, bike lane maintenance, traffic islands and bulb outs weed control.
- Department of Engineering/Utilities (Water Operations Division, Collections Division and Wastewater Treatment Facility)

### Pest Management Professionals

Pest management professionals, such as licensed pest control operators, may be contracted by the City of Dixon to provide expertise in pest identification, monitoring, and management. Their responsibilities would include conducting pest assessments, recommending appropriate pest management strategies, and applying pesticides (as a last resort) when necessary, in accordance with IPM principles and relevant laws and regulations.

### Public Outreach and Education Specialists

Public outreach specialists are responsible for developing and implementing public outreach and education programs to raise awareness about IPM principles, provide guidance on pest prevention and control measures, and promote responsible pesticide use.

### Integrated Pest Management Advisory Committee

This group, coordinated by the Pest Management Coordinator, consists of representatives from various City departments, pest management professionals, residents, and other stakeholders. They would provide guidance and oversight in the development, implementation, and evaluation of the city's IPM plan as appropriate.

## **Section 4. Pest Monitoring and Identification**

An IPM program is a comprehensive and sustainable approach to effectively manage pests over the long term, employing multiple strategies and techniques. The use of pesticides is a short-term solution to pest problems and should be used only when the other components fail to maintain the pests or their damage below an acceptable level. Effective IPM practitioners possess in-depth knowledge of plant and pest biology, and successful IPM programs primarily rely on a blend of cultural practices, along with physical, mechanical, and biological controls to manage pests.

It is crucial to develop the skill of identifying all life stages of common pests present at each site. For instance, being able to identify weed seedlings allows for timely control measures before they mature and become harder to manage, preventing seed dispersal. Good pest prevention practices are critical to the IPM program, and can be very effective in reducing pest incidence.

The PMC, in collaboration with each department or division responsible for pest control measures, shall gather baseline data on the pest ecosystem(s). This includes assessing pest population(s) occurrence, size, density, and presence of natural enemy population(s).

Information on pest biology and various available control techniques shall be collected, and sensitive areas or conditions that may affect control options shall be documented. Data collection shall follow a standardized and repeatable approach. This information may be incorporated into departmental or divisional IPM plans, if necessary.

All monitoring methods and data shall be specified in the departmental or divisional IPM plan, systematically recorded, and available for review at the Interdepartmental IPM Review Group meetings.

### **Section 5. Thresholds**

To determine the need for pest treatment, it is essential to establish acceptable threshold levels for each target pest and site. Divisional IPM plans should include the threshold levels for common pests, determined by individual work groups, in conjunction with the PMC. In some cases, treatment may be mandated by federal or state laws or may address concerns raised by citizens. The assessment will be based on the following:

- The tolerable level of environmental, aesthetic and economic damage as a result of the pest population(s) and the tolerable level of risk to human health as a result of the pest population(s); or
- The size or density of the pest population that must be present to cause unacceptable environmental, aesthetic and/or economic damage; and the size, density and type of pest population that must be present to create a human health risk.

### **Section 6. Control Strategies**

IPM programs employ diverse pest control tactics simultaneously, aiming to minimize negative impacts on the environment. The use of multiple control tactics in combination is often more effective in reducing pest damage than relying on a single method. The selection of control measures by an agency is typically contingent upon specific case-by-case considerations, considering the unique site conditions. Each department or division, in consultation with the PMC, will evaluate and select appropriate and effective treatments, based on site-specific requirements.

The primary pest control tactics to choose from include:

- Prevention
- Cultural
- Mechanical/Physical
- Biological
- Pesticide

#### Prevention



Prevention is the most effective pest management strategy. By implementing design and management practices that diminish the capacity of the ecosystem to support target pest populations, the opportunities for pest establishment can be minimized or eliminated. Specific examples include the following:

- Use strategies that reduce the preferred harborage, food, water or other essential requirements of pests.
- Incorporate weed-free materials such as jute and coconut fiber mats, certified weed-free straw, low-no weed seed mixes, etc. for soil stabilization after construction projects or other soil disturbing activities.
- Employ landscape and structural design that is appropriate to the specific habitat, climate and maintenance the area will receive.
- Consider potential impacts of pests when designing projects and mitigate them through appropriate landscape design, such as adjusting water requirements or implementing weed barriers.

### Cultural

Cultural control involves employing management activities that prevent pest development by enhancing desired conditions. Below lists examples of cultural controls:

- Selection and placement of materials that encourages pest enemies and competitors.
- Modification/ removal of pest habitat to reduce pest harborage, food supply and other life support requirements.
- Managing vegetation, including activities such as irrigation, mulching, fertilization, aeration, seeding, pruning, and thinning.
- Waste management and proper food storage.
- Barriers and traps.
- Utilizing heat, cold, humidity, desiccation, or light as applied to affected areas.
- Prescribed grazing.

### Mechanical/Physical

Mechanical control tactics involve the use of manual labor and machinery to reduce or eliminate pest problems. Below lists examples of mechanical/physical controls:

- Mowing or weed-whacking
- Burning
- Hoeing or hand-pulling of weeds
- Trapping
- Flooding

### Biological

Biological pest management strategies involve augmenting or introducing populations of natural predators to target pests. The introduction of non-native organisms carries inherent risks and must be carefully evaluated and aligned with relevant county, state, and federal regulations. Examples of biological controls include the conservation and enhancement of natural enemies of pests, as well as the introduction of host-specific organisms that prey on pests.

The most common organisms used for biological control in landscapes are predators, parasites, pathogens and herbivores.

- Predators - organisms that eat their prey.
- Parasites - spend part or all their life cycle associated with their host. Common parasites lay their eggs in or on their host and then the eggs hatch, the larvae feed on the host, killing it.
- Pathogens - microscopic organisms, such as bacteria, viruses, and fungi that cause diseases in pest insects, mites, nematodes, or weeds.
- Herbivores are insects or animals that feed on plants. These are effective for weed control. Bio-controls for weeds eat seeds, leaves, or tunnel into plant stems.

### Chemical

Chemical pest management involves the use of reduced-risk pesticides to effectively eliminate target pests. Pesticides are categorized into six types:

- Herbicides - used to kill, burn-down, or defoliate pest plant species
- Insecticides - used to kill or repel invertebrate pests
- Rodenticides - used to kill rodent pests
- Fungicides - used to eliminate pest molds and fungus
- Nematicides - used to kill pest nematodes
- Molluscicides - used to kill slugs and snails

### **Section 7. Pesticide Use and Management**

Pesticides will be employed as a last resort, after careful assessment by the PMC, when other methods have been found to be ineffective or financially impractical (e.g., inability to control the pest or budgetary constraints). The following general and specific practices will be adhered to:

- Prior approval from a Supervisor, PMC, or their authorized representative is mandatory for all pesticide applications, with a written recommendation from the PMC.
- Pesticide applications must be carried out by a qualified applicator or under their supervision, ensuring that direct exposure to people, animals, and property on-site or nearby is avoided.

- Timing of pesticide applications should be planned to coincide with the most vulnerable stage of the target pest species.
- Efforts shall be made to prevent harm to non-target plants, particularly when applying a non-selective herbicide, through careful and cautious application practices.

In addition, considerations should be given to the proximity to water bodies, irrigation schedules, weather (rain or wind), etc. that are secondary factors that may result in the pesticide being moved off-site into the environment. Consideration should be made of the temporary loss of use of an area (application in a park may result in the area being sectioned off).

No pesticides shall be sprayed when weather conditions are:

- Winds in excess of 10 mile per hour
- Damp or foggy
- Rainy or within 48 hours of 50% probability rainfall event.
- Temperatures are below 40°F or above 95°F

#### Reduced-Risk Pesticide Evaluation

The City of Dixon will use pesticide assessment methodology similar to the City of San Francisco's Department of the Environment to create a list of reduced-risk pesticides that are approved for use in the City of Dixon IPM program. The Reduced-Risk Pesticide List is the outcome of a multi-step process that entails the collaborative efforts of environmental scientists and pest managers. The approval for pesticide uses in the IPM program will be determined based on factors such as pesticide hazard, public exposure risk, necessity, and availability of alternatives. The following steps will be undertaken to develop this list:

- Hazard Assessment - The PMC will compile a list of pesticides that may be necessary for pest control. The PMC will then assign each pesticide product to a hazard tier based on the toxicity of its active ingredients and other identified ingredients, if applicable. The process and criteria for assessing the hazard tier will be outlined in Attachment A.
- Exposure Assessment - The PMC, project affiliated City staff, environmental scientists and pest managers (Assessment Team) will review the list of pesticides assessed and will discuss:
  - The human and environmental exposure potential based on product type, application method and location.
  - Product effectiveness. How well does it work on target pest?
  - Product need. Are there equally effective alternatives? If not, is this product the least-hazardous option for the application?

Products recommend for placement on the list are categorized in one of three ways:

- Least Restricted – Products that are generally the least hazardous pesticides on the list.
- More Restricted – Products have specific restrictions on allowable applications.

- Most Restricted – Pesticides that are considered the least hazardous chemical alternative for a particular application but pose the greatest concern to human or environmental health.

The PMC will post the proposed/ modified Reduced-Risk Pesticide List on the City Website annually for public comment and suggestions prior to final approval. An example Reduced-Risk Pesticide list for the City of Dixon is provided in Attachment B. It should be noted that the example list is hypothetical, inclusive, and is based on initial chemical hazard assessment and staff estimation of exposure assessment. A final list is subject to review, modification and approval by the Assessment Team subsequent to the public comment period.

### Public Notifications and Site Postings

All use of pesticides from the approved list, where the label requires posting, shall be posted near the application area. Contractors who apply a pesticide on City of Dixon property, must submit a completed Pesticide Application Information form to a supervisor no less than 72 hours prior to the desired day of the proposed pesticide application. The information provided includes the pesticide to be applied, the area of the proposed application, and the date of the proposed application. The PMC provides the information to the public via city webpage, and other appropriate outreach media.

All pest management activities need proper site notification, detailing what is being controlled, the reasons behind it, and the methods being employed. This includes various activities such as modifying habitats, solarization, adjusting irrigation, mulching, and more. In cases where a pesticide application is planned in a heavily frequented area, like a park or greenbelt, a physical notice must be posted at the site at least 24 hours prior to the treatment. This public notice should include the name of the pesticide, location of the application, scheduled date, and staff contact information. After the treatment, the sign should remain in place for a minimum of 24 hours to inform people of the completed treatment. Additionally, small standalone signs indicating that an application is in progress must be placed at each end of the treated area, spaced no more than 300 feet apart and moved along as the pesticide dries. These signs should contain appropriate pesticide awareness information and should not be removed until the pesticide spray has dried.

### Exemptions

In cases of special, unforeseen, or emergency situations, City departments are required to obtain a formal exemption from the City of Dixon in order to use products that are not included in the Reduced-Risk Pesticide List (see Attachment C for Pesticide Exemption Form). Exemptions may be granted for pilot testing of new, safer products.

## **Section 8. Record Keeping and Reporting**

The City of Dixon shall maintain records of all pesticide applications and shall make the information available to the public upon request. Each City department that uses pesticides shall keep records of all pest management activities. Each record shall include the following information:

- Identity of the pest and how the identification was made;
- The size and or density of the pest infestation;
- The geographic distribution of the pest problem in the managed area;
- Prevention and other non-chemical methods of control used;
- The type and quantity of pesticide used;
- The site of the pesticide application;
- The date the pesticide was used;
- The name of the pesticide applicator;
- The application equipment used; and
- Experimental efforts.

### Annual Reporting

The PMC will compile the previous year's IPM data from all City departments and produce an annual report. Each department using pest control methods shall submit their information through their department IPM liaison to the PMC. The report will include a review of new IPM strategies as well as trends in IPM techniques over time.

## **Section 9. Public Education and Outreach**

The City will develop and implement targeted outreach programs that convey messages to the residents and community specific to the proper use and application of pesticides, as well as encourage the use of less toxic options to help reduce reliance on pesticides that threaten water quality within the basin. The public education and outreach methods will include the following:

- Website – The City website provides design guidelines for stormwater compliance including tips for reducing and controlling stormwater runoff, implementation of BMPs for pesticides and other pollutants, and other strategies for protecting water quality. The website will be updated to include links to pesticide-related information and options for less toxic methods of pest control, as well as this IPM Principles webpage, and the University of California Statewide Integrated Pest Management Program (UC IPM) for further information. The website will include annual reports and departmental plans.
- Informational signs at pest management areas about management methods.
- Residential/Community Outreach – The City participates in regional outreach efforts through mixed media advertising campaigns (radio, TV, bus and bench ads, etc.),

providing less toxic pest management info at public events such as farmers market, arboretum plant sales, and community garden events as well as environmental programs put on by the City of Dixon, and/or hosting outreach events. These events are designed to engage the public in conversations about the importance of protecting our communities from the hazards of pesticides and runoff that can occur by misusing or over applying pesticides and fertilizers.

## **Section 10. Evaluation and Review**

The City of Dixon's IPM Policy is a living document; it is a document that shall be continually edited and updated. To ensure the IPM program continues to be an adequate tool to meet the City's pest challenges while upholding the program goals, the PMC and City staff shall continuously examine and evaluate components of the program's effectiveness. In addition, all contractors that apply pesticides on the City's behalf are required to adhere to the IPM Policy.

## **Section 11. Conclusion**

The procedures provide in this document aim to enhance the long-term prevention and control of pest issues, which encompass insects, weeds, diseases, and vertebrates, while minimizing adverse effects on human health, the environment, and non-target organisms. The focus is on improving cultural practices to proactively prevent problems and utilizing alternative control measures instead of relying solely on broad spectrum pesticides. The latest information on IPM including the management of new pests in the landscape, can be obtained from local UC Cooperative Extension Advisors, UC IPM Regional Advisor, or the Statewide UC IPM website at [www.ipm.ucdavis.edu](http://www.ipm.ucdavis.edu).

### **Attachments:**

Attachment A: Hazard Tier Review Process (Adopted from the City of San Francisco Department of the Environment's guidelines)

Attachment B: Preliminary\* Reduced-Risk Pesticide List for City of Dixon

Attachment C: Pesticide Exemption Form

## **RESOURCES and REFERENCES**

**Portions of this Integrated Pest Management Plan have been adopted from the following documents:**

California Statewide Integrated Pest Management Program - [https://ipm.ucanr.edu/what-is-ipm/#IPM\\_212\\_1](https://ipm.ucanr.edu/what-is-ipm/#IPM_212_1)

Integrated Pest Management for Municipalities, Contra Costa Clean Water Program - <https://www.ccleanwater.org/userfiles/kcfinder/files/IPM-Guidance-Manual-Final-June-2015-print-ready-w-bookmarks-blue-links%281%29.pdf>

City of Davis Integrated Pest Management Policy and Procedures, September 2017.

City of Fountain Valley Integrated Pest Management (IPM) Policy & Implementation Guidelines, 2015.

City of San Francisco Guide to San Francisco’s Reduced Risk Pesticide List – [https://sfenvironment.org/sites/default/files/fliers/files/sfe\\_th\\_guide\\_to\\_reduced\\_risk\\_pesticide\\_listposted.pdf](https://sfenvironment.org/sites/default/files/fliers/files/sfe_th_guide_to_reduced_risk_pesticide_listposted.pdf)

University of California Division of Agriculture and Natural Resources Publication 8093 – Establishing Integrated Pest Management Policies and Programs: A guide for Public Agencies. Mary Louise Flint, et al.

## ATTACHMENT A

### Hazard Tier Review Process (Adopted from the City of San Francisco Department of the Environment’s guidelines)

Pesticide products are assigned a hazard tier ranking after evaluating the hazard indices listed in the following section. The product is assigned a ranking of High, Moderate, or Low for each characteristic based on the ranges or values shown in Table 3 below. If any of the criteria are in the High category, the product is placed in Tier 1. If the chemical does not have any criteria in the High category, but does have at least one criteria in the Moderate category, the product is placed in Tier 2. Products with criteria only in the Low category are placed in Tier 3. See Table 1 for a summary of rankings, and Table 2 for a summary of data sources.

**Table 1: Tier Rankings Derived from Hazard Screening**

Tier 1	Highest Concern. At least one criterion in Table 3 placed in highest hazard category
Tier 2	Moderate concern. At least one criterion in Table 3 placed in the moderate hazard category
Tier 3	Lowest concern. No criteria flagged for Tiers 1 or 2

**Table 2: Hazards Evaluated and Data Sources Used**

<b>Hazard</b>	<b>Sources of Data</b>
Acute toxicity	Product label: Signal word (Caution, Warning or Danger)
Restricted use	Product label: Use restricted to professional applicators
Cancer	Cancer classification of ingredient by US Environmental Protection Agency (EPA), State of California (Proposition 65 list), <sup>20</sup> National Toxicology Program (Report on Carcinogens), <sup>21</sup> or the International Agency for Research on Cancer (IARC) Monographs <sup>22</sup>
Reproductive or Developmental toxicity	Designation of ingredient by the State of California (Proposition 65 list <sup>20</sup> ), US EPA on the Toxics Release Inventory list <sup>1</sup>
Endocrine disruption	Designation of ingredient by the European Commission <sup>2</sup> or included in the book Environmental Endocrine Disruptors by Lawrence H. Keith <sup>3</sup>
Water pollution potential	Ingredient listed under Clean Water Act Section 303(d) <sup>4</sup>
Hazards to birds	Product label or Material Safety Data Sheet (MSDS): Presence and wording of bird hazard statement or Lethal Dose 50 (LD50) or Lethal Concentrations 50 (LC50) of product (if available)
Hazards to aquatic life	Product label or MSDS: Presence and wording of fish hazard statement or LC50 of product (if available)
Hazards to bees	Product label or MSDS: Presence and wording of bee hazard statement or LD50 of product (if available)
Hazards to other wildlife	Product label or MSDS: Presence and wording of wildlife hazard statement or LD50 or LC50 of product (if available)
Soil mobility	Soil mobility score (Groundwater Ubiquity Score or GUS) calculated from physical properties or CA Department of Pesticide Regulation's (DPR) assessment of groundwater contamination potential using physical properties. Physical property data available in the OSU Pesticide Properties Database, <sup>5</sup> CA DPR Pesticide Contamination Prevention Act Status Reports, <sup>6</sup> or the EU Footprint Pesticide Properties database <sup>7</sup>
Persistent, bioaccumulative, toxic substances (PBTs)	US EPA Waste Minimization priority chemical <sup>8</sup> or listed by the European Union as fulfilling PBT or Persistent Organic Pollutant (POP) criteria. <sup>9</sup>

**Table 3: Criteria for Pesticide Hazard Tier Ranking**

<b>Hazard</b>	<b>High</b>	<b>Moderate</b>	<b>Low</b>
Signal word	Danger	Warning	Caution or none
Restricted use	Yes	-	No
Cancer (see Table 1)	Known or Probable	Possible	Unclassified, Not Likely, not listed
Reproductive or developmental toxicity	Listed	-	Not listed
Endocrine disruption	EC category I or II	-	EC category III, not listed



Water pollution	303(d) listed	-	Not listed
Hazard to birds	“Extremely toxic”, “highly toxic” or high product toxicity based on LD50 or LC50 (see below)	“Toxic” or moderate product toxicity based on LD50 or LC50 (see below)	No warning language or low product toxicity based on LD50 or LC50 (see below)
Hazard to aquatic life	“Extremely toxic”, “highly toxic” or high product toxicity based on LC50 (see below)	“Toxic” or moderate product toxicity based on LC50 (see below)	No warning language or low product toxicity based on LC50 (see below)
Hazard to bees	“Extremely toxic”, “highly toxic” or high product toxicity based on LD50 (see below)	“Toxic” or moderate product toxicity based on LD50 (see below)	No warning language or low product toxicity based on LD50 (see below)
Hazard to wildlife	“Extremely toxic”, “highly toxic” or high product toxicity based on LD50 or LC50 (see below)	“Toxic” or moderate product toxicity based on LD50 or LC50 (see below)	No warning language or low product toxicity based on LD50 or LC50 (see below)
Soil mobility	-	GUS $\geq$ 2 or DPR classifies AI and exceeding Specific Numeric Values (SNVs)	GUS $\leq$ 2 and not listed by DPR as exceeding SNVs
PBT	Listed	-	Not listed

**Details on Hazard Indices Used in the Evaluation**

Acute Toxicity

EPA assigns every pesticide product to a hazard category based on the results of acute toxicity testing of the full product including inert ingredients. The testing includes the single dose required to cause death in test animals via ingestion, inhalation, and skin absorption. The testing also considers the degree of skin and eye irritation or damage. Based on the results of these tests, EPA assigns the product to a hazard category and requires a signal word such as Caution, Warning, or Danger to be placed on the label. Danger indicates the highest hazard, Warning indicates moderate hazard, and Caution indicates a lower hazard.

Restricted Use

Some pesticides are restricted to use only by certified pesticide applicators and are not available to the general public because of high toxicity, particularly hazardous ingredients, or environmental hazards. Pesticides designed as restricted use are so indicated on the product label.

Cancer (known ingredients only)

Various state, federal, and international organizations evaluate or list chemicals for carcinogenicity, their potential to cause cancer.<sup>19, 20, 21, 22</sup> Due to the expense and difficulty of such evaluations, not all agencies have reviewed the same chemicals and not all reach the same conclusions on a given chemical. For this reason, we use the ratings of several agencies whenever possible. These ratings indicate the strength of the scientific evidence that a particular chemical can cause cancer in humans, but they do not consider the potency of the chemical, i.e. the number of cancers that will result from a standard level of exposure to a population. The various agencies use different words to describe the strength of evidence, such as possible, probable, likely, known, etc. In order to simplify the rating, we have assigned the various phrases used by the different agencies to a standard phrase used in the Hazard Tier assessment (see Table 4). The tier rating is based on the highest likelihood assigned by any agency that has evaluated the chemical.

**Table 4: Standardized Cancer Rankings Used in the Hazard Tier Assessment**

ORGANIZATION	ORGANIZATION RATING	STANDARDIZATION FOR HAZARD TIER
US EPA <sup>19</sup>	<p><b>Group A:</b> Known Carcinogen                      Known/ Likely Likely to be Carcinogenic to Humans</p> <p><b>Group B:</b> Probable Human Carcinogen                      B1: Sufficient evidence of carcinogenicity from animal studies with limited evidence of carcinogenicity from epidemiologic studies in humans</p> <p><b>Group B2:</b> Sufficient evidence of carcinogenicity from animal studies with inadequate or no data from epidemiologic studies in humans</p> <p><b>Group C:</b> Possible Human Carcinogen                      Likely to be Carcinogenic to Humans at High Doses, but Not Likely at Low doses                      Suggestive Evidence of Carcinogenicity to Humans</p> <p><b>Group D:</b> Not classifiable as to human carcinogenicity                      Data are</p>	<p>Known or Probable</p> <p>Known or Probable</p> <p>Known or Probable</p> <p>Known or Probable</p> <p>Possible</p> <p>Unclassifiable</p>

	inadequate for an assessment of human carcinogenic potential  <b>Group E:</b> Not Likely to be Carcinogenic to Humans	Unclassifiable Not Likely
IARC <sup>22</sup>	<b>Group 1:</b> Carcinogenic to Humans  <b>Group 2A:</b> Probably Carcinogenic to Humans  <b>Group 2B:</b> Possibly Carcinogenic to Humans  <b>Group 3:</b> Unclassifiable as to Carcinogenicity to Humans  <b>Group 4:</b> Probably not Carcinogenic to Humans	Known or Probable  Known or Probable  Possible  Unclassifiable  Not Likely
National Institutes of Health (NIH)/ National Toxicology Program (NTP) <sup>21</sup>	Known to be a Human Carcinogen  Reasonably Anticipated to be a Human Carcinogen  Reviewed but not listed	Known or Probable  Known or Probable  Not Listed
Prop 65 <sup>20</sup>	Known to the State of California to Cause Cancer	Known or Probable

**Reproductive/Developmental Toxicants (known ingredients only)**

Known ingredients in the products are screened against the State of California lists of known reproductive and developmental toxicants,<sup>20</sup> the US EPA Toxics Release Inventory (TRI) chemical hazard list,<sup>32</sup> or the list from the National Toxicology Program’s Health Assessment and Translation (formerly the Center for Evaluation of Risks to Human Reproduction).<sup>33</sup>

**Endocrine Disruptors (known ingredients only)**

Under the Food Quality Protection Act, the EPA is required to screen pesticide ingredients for endocrine system effects. Until that screening is done, a comprehensive list of endocrine disruptors will not be available. For purposes of this screening, we used the list of endocrine disruptors compiled by the European Commission<sup>24</sup> and in the book Environmental Endocrine Disruptors by Lawrence Keith.<sup>25</sup> Chemicals on the European Union (EU) list are classified for both humans and wildlife as Category I: evidence for endocrine disruption in living organisms, Category II: evidence of potential to cause endocrine disruption, or Category III: low exposure concern, no

scientific basis for inclusion, or insufficient information. The list of endocrine disruptors will likely be expanded at a later date, when US EPA publicizes the results of the Endocrine Disruptor Screening Program.

### **Water Pollution (known ingredients only)**

Section 303(d) of the federal Clean Water Act requires states to compile a list of water bodies with excessive contamination. The list of impaired water bodies in the area where the product will be used (available from the US EPA 303(d) web site<sup>34</sup>) is searched for pesticide active ingredients. Based on a site-specific analysis of the water bodies, products are assessed as to whether they contain priority 303(d) pollutants for that area.

### **Hazards to Birds, Aquatic Life, Bees, and Other Wildlife**

The US EPA requires particular hazard warning statements on pesticide product labels depending on the toxicity of the active ingredients and the formulated product to particular off-target species, evidence that adverse effects have occurred, and the use for which the product is intended. The hazard assessment is based on whether such warnings appear on the specific product label or the acute toxicity of the product as described in the MSDS. This toxicity is expressed as an LC50 (or LD50) that is the lethal concentration (or dose) to 50% of the test organisms in a laboratory test. The criteria for defining toxicity for different species are shown in Table 5 below.

**Table 5: Toxicity Reference Values of Terrestrial and Aquatic Wildlife**

Category	Mammal and Bird LD50 (mg/kg) <sup>35</sup>	Mammal and Bird LC50 (mg/kg of food) <sup>36</sup>	Aquatic LC50 (mg/L) <sup>36</sup>	Bee LD50 (g/bee) <sup>37</sup>
High Toxicity	<50	<500	<1	<2
Moderate Toxicity	50-500	500-1,000	1-10	2-11
Low Toxicity	>500	>1,000	>10	>11

### **Mobility in Soil (known ingredients only)**

The potential for groundwater or surface-water pollution by pesticides is dependent on many factors, including persistence of the ingredients, water solubility, soil binding, amount of rainfall or irrigation, soil properties, amount and frequency of applications, soil slope, vegetation present, proximity to ground- or surface-water, etc. The hazard assessment only considers the properties that relate strictly to the pesticide itself. The potential for a pesticide moving to surface water or groundwater is thus assessed in one of three ways:

1. The Groundwater Ubiquity Score (GUS) is an empirically derived index that relates pesticide persistence and soil binding to mobility. The GUS index is defined mathematically as:

$$\text{GUS} = \log_{10}(\text{half-life}) \times [4 - \log_{10}(\text{Koc})]$$

where Koc is the soil sorption coefficient and half-life is the soil half-life in days. Information on pesticide Koc values can be found in the OSU Pesticide Properties database,<sup>27</sup> the California Department of Pesticide Regulation groundwater Status Reports,<sup>28</sup> or in the EU Footprint Pesticide Properties database.<sup>29</sup>

A pesticide movement rating ranging from “extremely low” to “very high” has been assigned to the numerical values by the researchers in the Oregon State University (OSU) Extension Pesticide Properties Database.<sup>27</sup> The values are shown in Table 6.

**Table 6: Pesticide Mobility in Soil as a Function of Groundwater Ubiquity Score**

GUS Value	Pesticide Movement Rating
<2	Low
>2.0-3.0	Moderate
>3.0	High

2. The California Department of Pesticide Regulation (DPR) lists pesticide active ingredients as potential groundwater contaminants when physical properties exceed SNVs. In order for a chemical to be listed, one of the following must be true:

Water solubility: > 3 ppm (mg/L), or  
Soil adsorption coefficient (Koc): < 1,900 cm<sup>3</sup>/g

AND one of the following must be true

Hydrolysis half-life: > 14 days, or  
Aerobic soil metabolism half-life: > 610 days, or  
Anaerobic soil metabolism half-life: > 9 days

The list of pesticides that exceed SNVs is available from DPR’s annual Groundwater Status Reports.<sup>28</sup>

3. In addition to the GUS index and DPR’s assessment, information on pesticide water contamination potential is noted from product label warnings. EPA requires two levels of warnings for products with characteristics that have been determined to result in likely contamination of groundwater from use as labeled. A lower level of warning is required if no actual detections have occurred or no field studies have been done. A higher level of warning is required if detections have occurred or field studies have shown that the

chemical leaches. For purposes of the initial screening, the presence of either warning is considered an indication that the chemical has high mobility. In rare cases where a label ground-water advisory occurs but the GUS index or DPR assessment did not indicate high mobility, the label advisory is given priority.

Pesticides that have high soil mobility according to the criteria above, but are not otherwise toxic or bioaccumulative are classified as Tier 2.

### **Persistent, Bioaccumulative, Toxic Chemicals (PBTs)**

In recent years much attention has been paid to toxic chemicals that persist in the environment and bioaccumulate. PBTs pose a serious threat because they can build up in ecosystems, wildlife, and humans even when deposited slowly. Many organizations including the United Nations, International Joint Commission on the Great Lakes, U.S. EPA, and Washington State Department of Ecology have proposed strategies to reduce or eliminate them. The list used for this evaluation is EPA's Waste Minimization Priority Chemicals list or listed by the European Union as fulfilling PBT or Persistent Organic Pollutant (POP) criteria. New lists will be added as more information becomes available.

### **References**

<sup>1</sup> US EPA. 2012. TRI-Listed Chemicals. <http://www2.epa.gov/toxics-release-inventory-triprogram/toxicity-data-categorytri-listed-chemicals>

<sup>2</sup> EC, 2000. Towards the establishment of a priority list of substances for further evaluation of their role in endocrine disruption, Annex 13 (List of 146 substances with endocrine disruption classifications prepared in the Expert meeting). European Commission. Final Report, November 2000.  
[http://ec.europa.eu/environment/docum/01262\\_en.htm#bkh](http://ec.europa.eu/environment/docum/01262_en.htm#bkh).

<sup>3</sup> Keith LH. 1997. Environmental Endocrine Disruptors: A Handbook of Property Data. Wiley Interscience (New York, 1997)

<sup>4</sup> US EPA. National Summary of Impaired Waters and TMDL Information.  
[http://iaspub.epa.gov/waters10/attains\\_nation cy.control?p\\_report\\_type=T](http://iaspub.epa.gov/waters10/attains_nation cy.control?p_report_type=T).

<sup>5</sup> OSU. OSU Extension Pesticide Properties Database. <http://npic.orst.edu/ingred/ppdmove.htm>.

<sup>6</sup> CA DPR, Status Report Pesticide Contamination Prevention Act (issued annually). Environmental Monitoring Reports. California Department of Pesticide Regulation.  
<http://www.cdpr.ca.gov/docs/emon/pubs/ehapreps.htm>.

<sup>7</sup> EU Footprint Database. 2011. <http://www.eu-footprint.org>.

<sup>8</sup> US EPA. Waste Minimization Priority Chemicals List. National Waste Minimization Partnership Program.

<http://www.epa.gov/epawaste/hazard/wastemin/priority.htm>.

<sup>9</sup> EU. 2012. Persistent Bioaccumulative Toxins. European Commission Joint Research Centre, Institute for Health and Consumer Protection (IHCP).

<http://esis.jrc.ec.europa.eu/index.php?PGM=pbt>.

<sup>19</sup> US EPA, List of Chemicals Evaluated for Carcinogenic Potential. US Environmental Protection Agency.

<http://www.epa.gov/opp00001/carlist/>.

<sup>20</sup> CA OEHHA, Proposition 65 List of Chemicals Known to Cause Cancer, Developmental or Reproductive Toxicity. California Office of Environmental Health Hazard Assessment.

[http://oehha.ca.gov/prop65/prop65\\_list/Newlist.html](http://oehha.ca.gov/prop65/prop65_list/Newlist.html).

<sup>21</sup> NTP, 2011. 12th Report on Carcinogens. National Toxicology Program.

<http://ntp.niehs.nih.gov/?objectid=03C9AF75-E1BF-FF40-DBA9EC0928DF8B15>

<sup>22</sup> IARC, IARC Monographs on the Evaluation of Carcinogenic Risks to Humans.

<http://monographs.iarc.fr/>

<sup>32</sup> US EPA. 2012. TRI-Listed Chemicals. <http://www2.epa.gov/toxics-release-inventory-triprogram/toxicity-data-categorytri-listed-chemicals>

<sup>33</sup> NTP. 2012. Health Assessment and Translation (Formerly CERHR).

<http://ntp.niehs.nih.gov/?objectid=497C419D-E834-6B35-8AF15D389859AF07>.

<sup>34</sup> US EPA. How's My Waterway? <http://watersgeo.epa.gov/mywaterway/>.

<sup>35</sup> US EPA. Series 870 Health Effects Test Guidelines: Acute Toxicity Testing Background, US EPA Office of Pollution Prevention and Toxic Substances Harmonized Test Guidelines, US EPA,

<http://www.regulations.gov/#!documentDetail;D=EPA-HQ-OPPT-2009-0156-0002>.

<sup>36</sup> Kamrin, MA. 1997. Pesticide Profiles: Toxicity, Environmental Impact, and Fate. Lewis Publishers. Boca Raton, FL. 37 US EPA 2012. Label Review Manual, Chapter 8: Environmental Hazards.

<http://www.epa.gov/oppfead1/labeling/lrm/>

## ATTACHMENT B

### Preliminary\* Reduced Risk Pesticide List for City of Dixon (Adopted from City of Davis)

Product Name	Type	Ingredient	Hazard Tier	Use Limitation Type	Possible Use Limitations
Arena	Insecticide	Clothianidin	Most Hazardous (Tier I)	Most limited	Significant ecological toxicity- phase out and find alternative
Cayuse Plus	Adjuvant	Ammonium sulfate, Ethylene glycol	Most Hazardous (Tier I)	More limited	Parks and greenbelts
Direx	Herbicide (Pre emergent)	Diuron	Most Hazardous (Tier I)	Most limited	No use in parks or greenbelts. Significant human and ecological toxicity- phase out and find alternative
Fusilade II	Herbicide (Grass selective)	Fluazifop p Butyl	Most Hazardous (Tier I)	Most limited	No use in parks or greenbelts. Significant human and ecological toxicity- phase out and find alternative
Garlon 4 Ultra	Herbicide	Triclopyr, butoxyethyl ester 60.45%	Most hazardous (Tier I)	Most Limited	Use only for targeted treatments of high profile or highly invasive exotics via dabbing or injection. May use for targeted spraying only when dabbing or injection are not feasible. HIGH
Goal 2XL	Herbicide	Oxyfluorfen	Most Hazardous (Tier I)	Most limited	No use in parks or greenbelts. High priority to find alternative



Product Name	Type	Ingredient	Hazard Tier	Use Limitation Type	Possible Use Limitations
Malaice	Insecticide	Imidacloprid	Most Hazardous (Tier I)	Most limited	No use in parks or greenbelts. Significant ecological toxicity. High priority to find alternative
Roundup Custom	Herbicide	Glyphosate	Most Hazardous (Tier I)	Most limited	No use in parks or greenbelts. Other limitations: For aquatic uses, use for emergent plants in ponds, lakes, drainage canals, and areas around water or within watershed areas.
Snap Shot	Pre Emergent herbicide	Trifluralin Isoxaben	Most Hazardous (Tier I)	Most limited	Limited to areas of low public access
Turflon Ester	Herbicide	Triclopyr, butoxyethyl ester 61.6%	Most hazardous (Tier I)	Most Limited	No use in parks or greenbelts. High priority to find alternative
Volunteer	Herbicide	Clethodim	Most Hazardous (Tier I)	Most limited	Subject to "Limitations on most hazardous pesticides". Do not use on over or near water.
Activator 90	Adjuvant	Alkylphenol ethoxylate	More Hazardous (Tier II)	More limited	Ok for most applications. Avoid non-target exposure.
Capstone	Herbicide (Broadleaf selective)	Aminopyralid	More Hazardous (Tier II)	More limited	Ok for most applications. Avoid non-target exposure. No use over/near water.
Choice	Adjuvant	Propionic acid ammonium salt, Ammonium sulfate	More Hazardous (Tier II)	More limited	Ok for most applications. Avoid non-target exposure.
Final - San - O	Herbicide	Ammoniated Soap of fatty acid	More Hazardous (Tier II)	More limited	Ok for most applications. Avoid non-target exposure.

Product Name	Type	Ingredient	Hazard Tier	Use Limitation Type	Possible Use Limitations
Liberate	Adjuvant	Lecithin, methyl esters of fatty acids, alcohol ethoxylate	More Hazardous (Tier II)	More limited	Ok for most applications. Avoid non-target exposure.
Milestone	Herbicide	Aminopyrali, triisopropanolamine salt (5928) 40.6%	More hazardous (Tier II)	More Limited	For invasive species in natural areas or parklands where other alternatives are ineffective, especially for invasive legumes and composites such as yellow star thistle and purple star thistle
MSO	Adjuvant	Methylated vegetable oil, alcohol ethoxylate, phosphatidyl choline	More Hazardous (Tier II)	More limited	Ok for most applications. Avoid non-target exposure.
R-11	Adjuvant	Alkylphenol ethoxylate, butyl alcohol, dimethylpoly siloxane	More Hazardous (Tier II)	More limited	Ok for most applications. Avoid non-target exposure.
Razorooter	Herbicide (sewer root intrusion)	Diquat dibromide	More Hazardous (Tier II)	More limited	Limited to sewer line root control.
Sapphire	Herbicide	Penoxsulam	More hazardous (Tier II)	More Limited	Ok for most applications. Avoid non-target exposure. No use over/near water.
Scythe	Herbicide	Pelargonic Acid	More Hazardous (Tier II)	More limited	Ok for most applications. Avoid non-target exposure.

Product Name	Type	Ingredient	Hazard Tier	Use Limitation Type	Possible Use Limitations
Sedgehammer	Herbicide (Nutsedge selective)	Halosulfuron methyl	More Hazardous (Tier II)	More limited	Ok for most applications. Avoid non-target exposure. No use over/near water.
Suppress	Herbicide	Capric Caprylic Acids	More Hazardous (Tier II)	More limited	Ok for most applications. Avoid non-target exposure.
Transline	Herbicide	Clopyralid	More Hazardous (Tier II)	More limited	For invasive species in natural areas or parklands where other alternatives are ineffective, especially for invasive legumes and composites such as yellow star thistle and purple star thistle.
Telar	Herbicide	Chlorsulfuron	More Hazardous (Tier II)	More limited	For invasive species in natural areas or parklands where other alternatives are ineffective, especially for invasive pepperweed.

**\* Inclusive list based on chemical hazard assessment of existing pesticide inventory with staff assumptions on human and environmental exposure risk. This list is not final and requires review, modification and approval of the PMC.**

## ATTACHMENT C

### Pesticide Exemption Form

This form is to be used to request an exemption for use of a pesticide product that is: a) not included on the Reduced-Risk Pesticide List, b) included on the list but a variance in restrictions of application is desired, or c) absent a recommendation from the PMC. The form shall be submitted to the department director for approval at least 4 days in advance of desired application. The PMC will post the exemption data on the City's website at least 48 hours prior to application.

### Applicant Information

Name \_\_\_\_\_

Department/Division \_\_\_\_\_

Phone \_\_\_\_\_

Email \_\_\_\_\_

### Pesticide

Date(s) of Proposed Use \_\_\_\_\_

Product Name \_\_\_\_\_

Active Ingredients \_\_\_\_\_

EPA Registration # \_\_\_\_\_

Pesticide Type (Insecticide, Herbicide, Fungicide, etc.)  
\_\_\_\_\_

Use Category (Approved-least hazardous/ Limited Use-more hazardous/ Limited Use Special Concern  
Most hazardous/ Not Listed) \_\_\_\_\_

\*Attach product Label and MSDS Sheets

### Use Location

Street Address \_\_\_\_\_

Detailed location on Site \_\_\_\_\_

## Justification

Target Pest \_\_\_\_\_

Date discussed with IPM Specialist \_\_\_\_\_

Justification for Use

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Explanation of Alternative Controls Tried

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Strategies to Prevent Future Exemptions

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Additional Comments

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Department Director Approval: \_\_\_\_\_ Date: \_\_\_\_\_

City Manager Approval: \_\_\_\_\_ Date: \_\_\_\_\_