Exhibit A

Addendum to the Environmental Impact Report

Integrated Pest Management Program

SCH# 2013092033

PREPARED FOR:

Midpeninsula Regional Open Space District
330 Distel Circle
Los Altos, CA 94022

January 9, 2019

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LEAD AGENCY:

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January 9, 2019

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ACRONYMS AND ABBREVIATIONS

ATV	All-terrain vehicle
BMP	Best Management Practice
Bti	*Bacillus thuringiensis* var. *israelensis*
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
District	Midpeninsula Regional Open Space District
DPR	California Department of Pesticide Regulation
EIR	Environmental Impact Report
HCP	Habitat Conservation Plan
IPA	Isopropylamine (salt)
IPM	Integrated Pest Management
IPMP	Integrated Pest Management Program
K	Potassium (salt)
MEA	Monoethanolamine (salt)
MLA	Mixer/loader/applicator
MND	Mitigated negative declaration
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety & Health Administration
PPE	Personal Protective Equipment
PT	Phenothrin
QAC	Qualified Applicator Certificate
QAL	Qualified Applicator License
RWQCB	Regional Water Quality Control Board
TCP	3,5,6-Trichloro-2-pyridinol
TEA	Triethylamine (salt)
TIPA	Triisopropanolamine (salt)
TMP	3,5,6-Trichloro-2-methoxypyridine
Triclopyr BEE	Triclopyr-2-butoxyethyl ester
USEPA	U.S. Environmental Protection Agency
WPS	Worker Protection Standard

Exhibit A

1 INTEGRATED PEST MANAGEMENT PROGRAM OVERVIEW

1.1 PURPOSE OF THIS DOCUMENT

In December 2014, the Midpeninsula Regional Open Space District (District) Board of Directors certified the Environmental Impact Report (EIR) (State Clearinghouse No. 2013092033) for the Integrated Pest Management (IPM) Program (herein referred to as the 2014 EIR). The 2014 EIR analyzed a proposed program that included implementing cultural, biological, manual/mechanical, and chemical IPM practices in buildings, recreational facilities, fuel management areas, rangelands and agricultural properties, and natural lands within District boundaries. The 2014 EIR evaluated the significant or potentially significant adverse effects on the physical environment resulting from implementation of the IPM Program (IPMP); described feasible measures, as needed, to mitigate any significant or potentially significant adverse effects; and considered alternatives that may lessen one or more of the significant or potentially significant adverse effects. The 2014 EIR determined adverse effects after consideration of District Best Management Practices (BMPs) incorporated into the IPMP.

The District's proposed modifications to the previously approved project include: (1) the addition of three new pesticides to the IPMP, (2) three new pesticide application methods, and (3) three new Best Management Practices (BMPs) along with clarification to other BMPs and one mitigation measure from the EIR. The District is also proposing minor modifications to the acreages to be treated on an annual basis using certain pest management methods. Finally, this proposed Addendum considers changed circumstances under which the project would be undertaken, specifically, the potential presence of two new Species of Special Concern.

Specifically, the project modifications would include the use of the following pesticides: 1) Garlon® 4 Ultra [triclopyr-2-butoxyethyl ester (triclopyr BEE)] and 2) Capstone® [triclopyr triethylamine (TEA) salt and aminopyralid triisopropanolamine (TIPA) salt] for the control of broadleaf weeds and woody plants, and 3) PT® Wasp-Freeze® II (prallethrin) for the control of wasps and hornets. Garlon 4 Ultra would be applied in fuel management areas, natural lands, and rangelands and agricultural properties via spot spray, cut-stump, and basal bark application for the control of vegetation. Capstone would be applied in natural lands and rangelands and agricultural properties via spot spray, cut-stump, and frill/injection for the control of vegetation. PT Wasp-Freeze II would be used outside of buildings and in recreational facilities via aerosol spray to control wasps and hornets.

Basal bark, frill/injection, and wick applications are new pesticide application methods for the control of vegetation that were not part of the previously approved project. In addition to the use of these application methods, some previously evaluated application methods are proposed for additional use for pesticides that were approved in the 2014 EIR. The IPMP modifications also include some minor modifications to the amounts of chemicals used and the acreages treated. In almost all cases, the differences in treatment area or amount of product used would be de minimis.

Further, some manual/mechanical treatment methods would additionally be used in natural lands, including: brushcutters, chainsaws, chippers, masticators, jawz implement, and pole pruners. These methods were previously approved in the 2014 EIR for use in fuel management areas. The District is also proposing some minor modifications to the acreages to be treated using manual/mechanical treatment methods for natural lands and fuel management areas.

Project modifications include the addition of three new BMPs to the IPMP to reduce reliance on glyphosate and further enhance visitor and worker safety. The updated BMPS are included in Table 4.

Changed circumstances under which the IPMP would be undertaken include the addition of the California giant salamander (*Dicamptodon ensatus*) and the Santa Cruz black salamander (*Aneides flavipunctatus niger*) to the California Department of Fish and Wildlife's (CDFW's) list of Species of Special Concern (Thomson *et al.*, 2016). Refer to Section 3 of this Addendum for a more detailed description of these proposed project modifications and changed circumstances. The project objectives identified in Section 3.5, page 3-8, of the 2014 EIR remain unchanged.

The purpose of this proposed Addendum is to consider whether these modifications to the project would meet any of the criteria listed in section 15152 of the California Environmental Quality Act (CEQA) Guidelines, resulting in the need for a subsequent or supplemental mitigated negative declaration (MND) or EIR under CEQA (Public Resources Code, section 21166; CEQA Guidelines, sections 15162, 15164).

As demonstrated in Section 4 below, the project modifications do not meet any of the criteria listed in section 15162 of the CEQA Guidelines. This means: (1) the modifications would not result in any new significant environmental effects or a substantial increase in severity of previously evaluated significant effects that result from either a substantial change to the project or changes to the project circumstances; (2) there is no new information of substantial importance since certification of the 2014 EIR that shows the modifications will have new significant effects or more severe effects than previously evaluated; and (3) no mitigation measures or alternatives found to be infeasible in the 2014 EIR, which are capable of substantially reducing a significant environmental effect, would now be feasible. Therefore, pursuant to section 15164 of the CEQA Guidelines, the differences between the approved project described in the 2014 EIR and the proposed modified project as currently described represent minor technical changes. For these reasons, an addendum to the 2014 EIR is the appropriate mechanism to address proposed modifications to the project.

This document concludes that the proposed addition of three new pesticides and the three new pesticide application methods would not alter any of the conclusions of the 2014 EIR. Minor changes in treatment acreage and chemical use were contemplated by and approved in the 2014 EIR. In addition, there would be no significant impacts to the two new species of special concern that are considered in this Addendum. No new significant environmental effects or a substantial increase in the severity of previously identified significant effects would result. The additions also would not affect any of the mitigation measures, including their feasibility or implementation. As mentioned above, none of the conditions listed in section 15162 of the CEQA Guidelines exist for the project modification described herein. Therefore, pursuant to section 15164 of the CEQA Guidelines, the differences between the approved project described in the 2014 EIR and the modification of the project as currently proposed and described in this addendum are minor and this addendum provides sufficient environmental documentation.

1.2 DISTRICT BACKGROUND

The District is a regional greenbelt system which manages over 62,000 acres of open space in 26 preserves. District preserves vary in size from 59 acres to over 17,000 acres. The District provides protection for local wildlife habitats necessary to sustain plant and animal life and natural resources and practices IPM to safely and effectively control pests while minimizing risk of adverse impacts to non-target receptors.

The District is located on the San Francisco Peninsula with boundaries that enclose an area of 227,900 acres in northwestern Santa Clara and southern/central San Mateo Counties, and a small portion of Santa Cruz County (**Figure 1**). The District's Sphere of Influence, or the area within which the District is likely to expand, includes an additional 12,333 acres. District preserves include redwood, oak, and fir forests; chaparral-covered hillsides; riparian corridors; grasslands; and wetlands along the San Francisco Bay. The District also participates in cooperative efforts, including regional trail systems in the Bay Area that overlap with District lands such as the Bay Trail, Ridge Trail, and Skyline-to-the-Sea Trail.

District lands protect a variety of habitats rich in both numbers and variety of plants and animals. The District preserves include tidal salt marshes in the east, which are used by thousands of migratory birds and are home to the endangered Ridgeway's rail and salt marsh harvest mouse. The heart of the District is separated by the eastern and western flanks of the Santa Cruz Mountains. These lands are covered in a diverse mix of oak woodland, grassland, chaparral, coastal scrub, and evergreen and coniferous forests. Creeks and streams that run through District lands provide refuge area for federally and California endangered coho salmon and federally threatened steelhead.

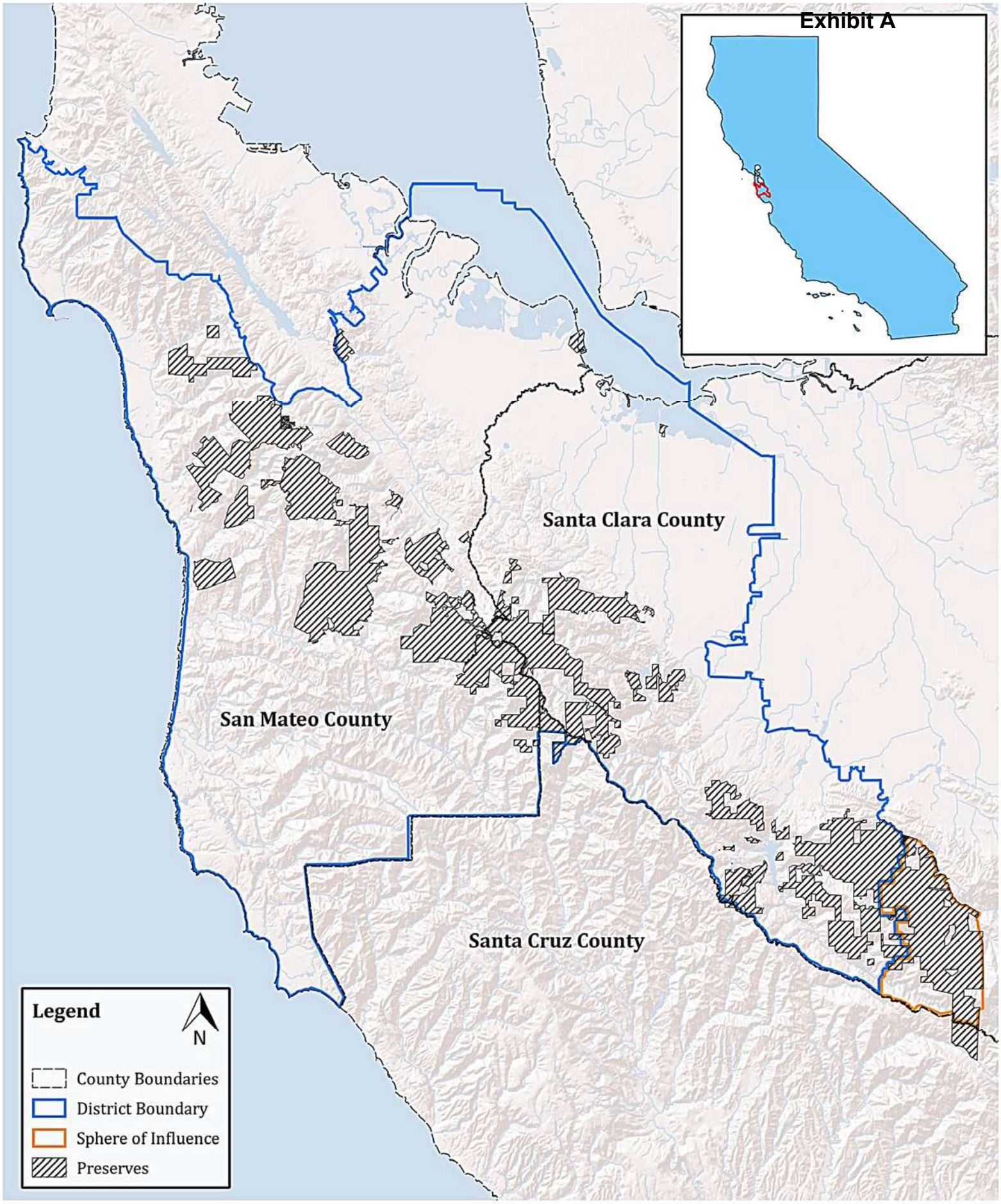

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Figure 1:

Midpeninsula Regional Open Space District Vicinity Map

1.2.1 Land Use

District properties include over 182 buildings, including an administrative office, three field offices, a nature center, residences, and numerous outbuildings such as barns, sheds, and water tanks in the preserves. Residential land uses adjacent to all District preserves total approximately 75 acres of land.

Human use is typically concentrated on preserves at the recreational facilities provided by the District. Recreational facilities within District preserves currently include approximately 479 miles of access road and trails as well as associated infrastructure (i.e., bridges, culverts, drainage ditches, parking lots, gates, stiles), picnic areas, one campground, off-leash dog zones, managed turf and landscaped recreation areas, pond viewing and dam areas, and Deer Hollow Farm.

Some District lands encompass rangelands, crop fields, and orchards that are actively managed as grazing or agricultural operations. Rangeland and agriculture activities on District preserves are primarily managed by lessees who typically operate under a Rangeland Management Plan or Agricultural Management Plan that is attached to their lease. These site-specific management plans guide the rangeland and agricultural activities to ensure compatibility with natural resource protection and low-intensity public recreation.

Natural areas make up the majority of District lands, and typically experience minimal levels of human use.

1.3 PROJECT HISTORY

The District's purpose is to acquire and preserve a regional greenbelt of open space land in perpetuity, protect and restore the natural environment, and provide opportunities for ecologically sensitive public enjoyment and education. The primary objective of the District's IPMP is to control pests through consistent implementation of IPM principles to protect and restore the natural environment and provide for human safety and enjoyment while visiting and working on District lands. This section describes both the IPMP itself and the history of the District's CEQA process for the IPMP.

1.3.1 Description and History of the IPMP

The IPMP is primarily a vegetation management program in wild lands; however, it also includes management of invasive animals on preserves, flammable vegetation near facilities, and rodents and insects in District-owned buildings. The IPMP provides the District with an objective evaluation tool and process to effectively and efficiently make IPM decisions while providing for safe recreational use of the preserves and protecting their natural and cultural resources. The IPMP is intended to be used for 10 years.

The District has identified the following five (5) distinct management categories for the IPMP:

- Buildings
- Recreational facilities
- Fuel management areas
- Rangelands and agriculture properties
- Natural areas

Specific pest control strategies used by the District vary by management category and include a combination of mechanical (e.g., mowing, pulling, discing, physical barriers), cultural (e.g., sanitation, prevention, mulching), and biological controls (e.g., hairy weevil), and, as needed, chemical controls (i.e., pesticides, bacterial pathogens). Whenever possible, the least harmful method(s) to control identified pests are used. If pesticides are deemed necessary to meet a pest control objective, products are applied according to label

instructions and all necessary measures are taken to protect the environment, the health and safety of visitors, employees, neighbors, and the surrounding natural areas, including water and soil resources.

In 2017, the District (2017a) conducted 1,005 non-pesticide treatments and 314 pesticide treatments for vegetation management. The non-pesticide methods included brush cutting, cutting, digging, flaming, mowing, and pulling of non-desirable or invasive vegetation (e.g., stinkwort, French broom, goat grass, yellow star thistle) across more than 285 acres (>0.46%) of District property. No data on area treated was available for 281 (28%) of the 1,005 non-pesticide treatments. Furthermore, approximately 10,000 acres (16%) of District land is managed by conservation grazing techniques annually (Sifuentes-Winter, C., District 2017, Pers comm).

Refer to **Table 1** for a summary of District pesticide use during 2016 and 2017 and **Figure 2** for a geographic interpretation of District pesticide use in 2017. As indicated in **Table 1** and illustrated in **Figure 2**, herbicides were applied to approximately 328 acres (0.5%) of District property in 2017. All herbicides were applied via spot spray or cut stump in discrete locations.

Table 1. District 2016-2017 Pesticide Use Summary[1,2]

Year	Pesticide Category	Active Ingredient (Product)	Amount Product Used (oz)	Area Treated (ac)
2016	Herbicides	Aminopyralid TIPA (Milestone)	7.71	26.86
		Clopyralid MEA (Transline)	3.08	2.10
		Imazapyr IPA (Polaris)	170.75	16.21
		Glyphosate IPA (Roundup Custom)	3.00	0.49
		Glyphosate K (Roundup ProMax)	498.30	32.81[3]
	Insecticides	D-trans Allethrin/Phenothrin (PT® Wasp-Freeze®)	-	NDA[4]
2017	Herbicides	Aminopyralid TIPA (Milestone)	17.79	150.05
		Clopyralid MEA (Transline)	12.49	5.25
		Glyphosate IPA (Roundup Custom)	0.25	0.0031
		Glyphosate K (Roundup ProMax)	2185.34	172.72
	Insecticides	D-trans Allethrin/Phenothrin (PT Wasp-Freeze)	87.50	NDA[4]

[1] Not shown: Bacterial pathogen (*Bacillus thuringiensis* var. *israelensis*) applications of 250 disks per year.

[2] Abbreviations: ounces (oz), acres (ac), triisopropanolamine (TIPA) salt, monoethanolamine (MEA) salt, isopropylamine (IPA) salt, potassium (K) salt.

[3] Area shown is an underestimation of total area treated due to incomplete dataset.

[4] No data available on area treated.

Sources: District, 2016, 2017a; Sifuentes-Winter, C., District 2017, Pers comm, Email RE: CEQA - Insecticide Reported Use

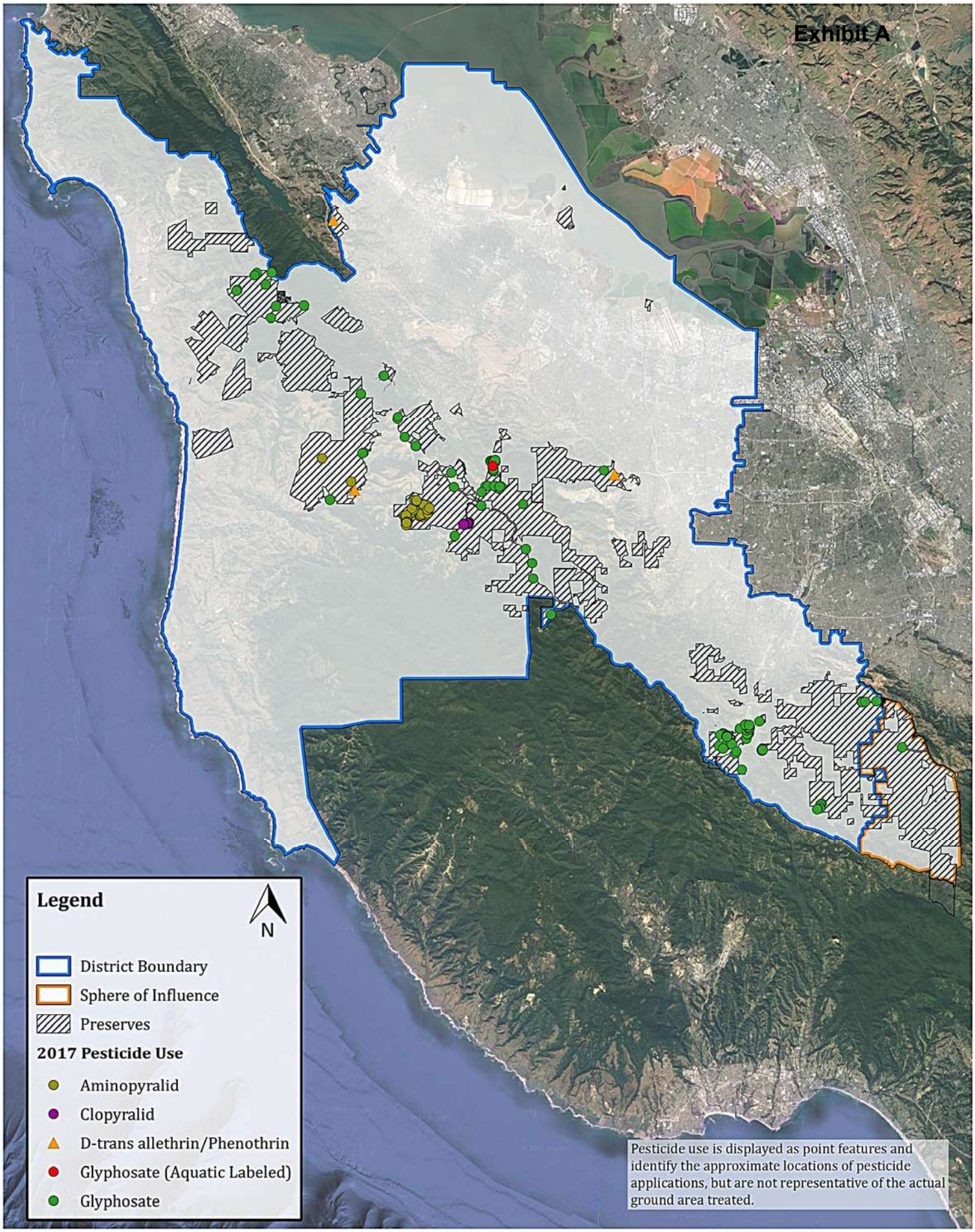

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Figure 2:

2017 Midpeninsula Regional Open Space District Pesticide Use Map

While the primary focus of the District's IPMP is vegetation management, other pesticides including insecticides and rodenticides may also be used after non-chemical methods (e.g., trapping, manual removal) have been considered, if the insects or rodents cause a human health and safety risk (e.g., occur in high traffic areas). When needed, insecticides such as d-trans allethrin and phenothrin (PT Wasp-Freeze) are applied to wasp and hornet nests located along preserve trails. For mosquito control, the bacterial pathogen *Bacillus thuringiensis* var. *israelensis (*Bti*)* is applied monthly to water troughs by rangers in open preserves. Bti may also be applied by residents who live on District land and receive annual label and usage training. Rodenticides were not applied on District land during 2016-2018 If rodenticide use is required, products may be applied by District staff or approved contractors in indoor residential areas via tamper-resistant box after prior District approval.

Refer to Table 3-1 in the 2014 EIR for all potential treatment actions permitted in the IPMP in 2014.

In September 2014, the District (2014a) released an IPM Guidance Manual for the IPMP. The IPM Guidance Manual includes several proposed program policies and identifies specific pest management actions including: preventative and maintenance measures, damage assessment procedures, tolerance levels and thresholds for action, and treatment options. The proposed IPM policy statements presented in the IPM Guidance Manual have since been adopted and are currently included in the District's (2014b) Resource Management Policies, published in December 2014. Appendix A of the IPM Guidance Manual is entitled "Pesticide Technical Background Information" and contains toxicity information on 14 pesticide active ingredients (glyphosate, aminopyralid, clopyralid, imazapyr, clethodim, potassium salts of phosphorus acid, cholecalciferol, d-trans allethrin, phenothrin, indoxacarb, hydroprene, fipronil, sodium tetraborate decahydrate, diatomaceous earth) and 4 adjuvants/surfactants (modified vegetable oil, lecithin, alcohol ethoxylates, alkylphenol ethoxylate) currently permitted for use within the IPMP.

1.3.2 IPMP CEQA Process and History

On September 16, 2013, the District issued a Notice of Preparation (NOP) (State Clearinghouse No. 2013092033) to inform agencies and the general public that a Draft EIR was being prepared and invited comments on the scope and content of the EIR and participation at a public scoping meeting. The NOP was posted with the State Clearinghouse, posted on the District website, and distributed to public agencies, interested parties and organizations. A determination of which impacts would be potentially significant was made for this project based on review of the information presented in the NOP, comments received as part of the public review process for the project, and additional research and analysis of relevant project data during preparation of the Draft EIR.

A series of public meetings on the project were held during preparation of the Draft EIR, beginning in September 2013. A public scoping meeting on the issues to be addressed in the Draft EIR was held on September 30, 2013. In addition, early consultation with relevant agencies, organizations, and individuals assisted in the preparation of the Draft EIR. After filing a Notice of Completion with the State Clearinghouse of the Governor's Office of Planning and Research, the Draft EIR was subject to a 45-day public comment period, beginning September 26, 2014, and ending November 10, 2014. A public information meeting on the Draft EIR was held during the review period on October 21, 2014.

The 2014 EIR analyzed a proposed program that included implementing cultural, biological, manual/mechanical, and chemical IPM practices in buildings, fuel management areas, natural lands, rangelands and agricultural properties, and recreational facilities within District boundaries. The Draft EIR evaluated the significant or potentially significant adverse effects on the physical environment resulting from implementation of the IPM Program; described feasible measures, as needed, to mitigate any significant or potentially significant adverse effects; and considered alternatives that may lessen one or more of the significant or potentially significant adverse effects. Adverse effects were determined after consideration of District Best Management Practices (BMPs) incorporated into the project. The District developed BMPs for the IPMP to protect human health and prevent significant environmental effects. The BMPs are applied to

IPM projects District-wide, as required, and were developed from District policies, the District's existing BMPs, known regulatory requirements, and evaluation of the IPMP activities. District BMPs for the IPMP are presented in Table 3-4 of the 2014 EIR. The project objectives identified in Section 3.5, page 3-8, of the 2014 EIR remain unchanged.

After consideration of the BMPs, the 2014 EIR determined the following categories of environmental effects to be Less Than Significant or Less Than Significant With Mitigation Incorporated within the District's IPMP:

- Aesthetics
- Biological resources
- Cultural resources
- Hydrology and water quality
- Hazards and hazardous materials

Effects found not to be significant include:

- Agriculture and forestry resources
- Air quality
- Geology and soils
- Greenhouse gas emissions
- Land use and planning
- Mineral resources
- Noise
- Population and housing
- Public services
- Recreation
- Transportation and traffic
- Utilities

Analysis of the project's aesthetic or visual impacts was based on evaluation of potential changes to the existing visual resources that would result from project implementation. Potential impacts on biological resources resulting from implementation of the IPMP were determined by evaluating the use of IPM techniques in relation to the habitat characteristics of the project, quantifying potential loss of common and sensitive habitats, and evaluating potential effects to common and special-status species that could result from this habitat loss. Special status species considered in the 2014 EIR include:

- 3 amphibian species
- 32 bird species
- 4 invertebrate species
- 3 fish species
- 8 mammalian species
- 3 reptile species
- 45 plant species

Cultural resource impact analysis considered the known cultural resource environmental setting in District lands, the potential for previously undocumented resources, and physical effects (i.e., disturbance, material alteration, demolishment) to known and previously undocumented cultural and paleontological resources that could result from implementation of the project. Evaluation of potential hydrologic and water quality impacts was based on a review of documents available from federal, state and local government to establish existing conditions and to identify potential environmental effects. Analysis of the project's public health and hazards impacts was based on the range and nature of foreseeable hazardous materials use, storage, and disposal resulting from the project and identified the primary ways that these hazardous materials could expose individuals or the environment to health and safety risks.

On December 3, 2014, the Final 2014 EIR (State Clearinghouse No. 2013092033) was published and consisted of the Draft EIR, public comments and responses, and clarifications and revisions to the Draft EIR text. On December 10, 2014, a public hearing to certify the 2014 EIR was held.

In June 2017, the District reviewed toxicity data on four additional pesticides (Garlon 4 Ultra, Capstone, Python Dust, and PT Wasp-Freeze II) for potential inclusion in the IPMP. The District determined that the following three chemicals would be evaluated for a CEQA Addendum as candidates for addition to the IPMP: triclopyr BEE (Garlon 4 Ultra), triclopyr TEA (Capstone), and prallethrin (PT Wasp-Freeze II). Note that Capstone contains 2 active ingredients: triclopyr TEA and aminopyralid TIPA. Aminopyralid TIPA was analyzed previously in the 2014 EIR. Further, the District determined that it would consider in its evaluation two new species of special concern: the California giant salamander and the Santa Cruz black salamander. These two species have recently been added to CDFW's list of Species of Special Concern (Thomson *et al.*, 2016).

2 CEQA GUIDANCE REGARDING PREPARATION OF AN ADDENDUM TO THE EIR

If, after certification of an EIR, there are changes or additions to a project that will require new discretionary actions, CEQA provides three possible mechanisms to address these changes: a subsequent MND or EIR, a supplemental MND or EIR, or an addendum to an EIR.

Section 15162 (a) of the CEQA Guidelines provides that when an EIR has been certified for a project, no subsequent or supplemental MND or EIR shall be prepared for that project unless the lead agency determines, on the basis of substantial evidence in light of the whole record, that one or more of the following conditions is met:

(1) substantial changes are proposed in the project which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects;

(2) substantial changes occur with respect to the circumstances under which the project is undertaken which will require major revisions of the previous EIR due to the involvement of new significant environmental effects or a substantial increase in the severity of previously identified significant effects; or

(3) new information of substantial importance, which was not known and could not have been known with the exercise of reasonable diligence at the time the previous EIR was certified as complete, shows any of the following:

   (A) the project will have one or more significant effects not discussed in the previous EIR;

   (B) significant effects previously examined will be substantially more severe than shown in the previous EIR;

   (C) mitigation measures or alternatives previously found not to be feasible would in fact be feasible, and would substantially reduce one or more significant effects of the project, but the project proponents decline to adopt the mitigation measures or alternatives; or

   (D) mitigation measures or alternatives which are considerably different from those analyzed in the previous EIR would substantially reduce one or more significant effects on the environment, but the project proponents decline to adopt the mitigation measures or alternatives.

Section 15164 of the CEQA Guidelines states that a lead agency or a responsible agency shall prepare an addendum to a previously certified EIR if some changes or additions are necessary, but none of the conditions described above in section 15162(a), calling for preparation of a subsequent or supplemental MND or EIR, have occurred.

CEQA allows lead and subsequent responsible agencies issuing additional discretionary approvals for a project to restrict their review of modifications to a previously approved project to the incremental effects associated with the proposed modifications, compared against the anticipated effects of the previously approved project at build-out. In other words, if the project under review constitutes a modification of a previously approved project which was subject to prior final environmental review, the "baseline" for purposes of CEQA is adjusted such that the originally approved project is assumed to exist.

The District is proposing minor modifications to the approved project; these changes are described in Section 3 of this Addendum. As demonstrated in detail below, the project modifications do not meet any of the criteria listed in section 15162. First, the modifications would not result in any new significant environmental effects or a substantial increase in severity of previously evaluated significant effects that result from either a substantial change to the project or changes to the project circumstances. Second, there is no new information of substantial importance since certification of the 2014 EIR that shows the modifications will have new significant effects or more severe previously evaluated effects. Finally, no mitigation measures or alternatives, which were found to be infeasible in the 2014 EIR and which are capable of substantially reducing a significant environmental effect, would now be feasible. Therefore, pursuant to section 15164 of the CEQA Guidelines, the differences between the approved project described in the 2014 EIR and the refined elements of the project as they are currently proposed are considered minor technical changes. Furthermore, the 2014 EIR and associated mitigation monitoring and reporting program remain valid for mitigating the identified significant impacts that would result from implementation of the project, including the proposed modifications. For these reasons, an addendum to the 2014 EIR is the appropriate mechanism to address modifications to the project.

3 DESCRIPTION OF PROPOSED PROJECT MODIFICATIONS

The District's proposed modifications to the previously approved project include addition of three new pesticides to the IPMP and three new pesticide application methods based on anticipated vegetation control work. More specifically, the project includes the use of: 1) Garlon 4 Ultra (triclopyr BEE) and 2) Capstone (triclopyr TEA, aminopyralid TIPA) for the control of broadleaf weeds and woody plants, and 3) PT Wasp-Freeze II (prallethrin) for the control of wasps and hornets. Garlon 4 Ultra would be applied in fuel management areas, natural lands, and rangelands and agricultural properties via spot spray, cut-stump, and basal bark application. Capstone would be applied in natural lands and rangelands and agricultural properties via spot spray, cut-stump, and frill/injection. PT Wasp-Freeze II would be used outside of buildings and in recreational facilities via aerosol spray.

Basal bark, frill/injection, and wick applications are new pesticide application methods for the control of vegetation that were not part of the previously approved project. In addition to the use of these application methods, some previously evaluated application methods are proposed for use for additional pesticides that were approved in the 2014 EIR. Cut-stump, basal bark, and frill/injection applications for the control of vegetation are also proposed for Milestone (aminopyralid TIPA) use in natural lands and rangelands and agricultural properties. Roundup ProMax (glyphosate K) is proposed to be applied as needed via cut-stump, frill/injection, and wick applications in recreational facilities, fuel management areas, rangelands and agricultural properties, and natural lands. These application methods are similarly proposed for treatments of Roundup Custom (glyphosate IPA) in recreational facilities, rangelands and agricultural properties, and natural lands. Proposed application methods for Transline (clopyralid MEA) treatments in recreational facilities, rangelands and agricultural properties, and natural lands include cut-stump and frill/injection. These application methods are also proposed for treatments of Polaris (imazapyr IPA) in recreational facilities and natural lands. Note that aminopyralid TIPA (Milestone, Capstone) and the cut-stump and spot spray application methods for the control of vegetation were previously evaluated in the 2014 EIR and are therefore not discussed further in this Addendum.

In addition, some previously approved manual/mechanical treatment methods for fuel management areas are proposed for use in natural lands, including: brushcutters, chainsaws, chippers, masticators, jawz

implement, and pole pruners. Because they were previously evaluated in the 2014 EIR and some of the District's fuel management areas are already contained within natural lands, the utilization of these tools in natural lands is not discussed further.

The District has also proposed some minor modifications to the acreages that would be treated using various treatment methods, the amounts of herbicides that might be used on an annual basis, and the timing of work for certain treatment methods. Some of these modifications result in an increase in treated acreage or herbicide quantity, and some represent a decrease. In most cases, the differences in treatment area or amount of product used would be de minimis and the changes in timing of work would be inconsequential. The 2014 EIR recognized that the IPMP is an adaptive management program, and that there would be minor changes from year to year that would not require changes to the EIR. As a general matter, the modifications to acreage, product quantity, and timing of work do not require further discussion. The only notable changes are the proposed increase in the use of manual/mechanical treatment methods in natural lands from 2 acres to 10 acres annually and the proposed adjustment in timing of manual/mechanical treatment methods in fuel management areas from April through June to any time during the year. Because these treatment methods involve generation of noise and could conceivably disrupt sensitive species, this Addendum considers the expansion of their use.

A summary of the treatment actions permitted in the IPMP including the proposed modifications is presented in **Table 2** (changes shown in underline/~~strikeout~~).

Table 2. District Integrated Pest Management Program – Treatment Actions and Estimates

IPM Management Category	Treatment Type	Treatment Method	Method of Application[1]	Purpose	Annual Application[2]	Timing of Work[3]	Frequency of Work[4]
Buildings	Manual	Sanitation	———	Structural pests, stray wildlife, pets	103 buildings	———	———
		Habitat modification	———	Structural pests, stray wildlife, pets	103 buildings	———	———
		Physical barriers	———	Structural pests, stray wildlife, pets	103 buildings	———	———
		Traps	Sticky, electric, snap, box, glue boards, water, lures	Structural pests, stray wildlife, pets	103 buildings	———	———
		Building retrofits	———	Structural pests, stray wildlife, pets	———	Spring/summer/fall	———
		Prevention	———	Structural pests, stray wildlife, pets	———	———	———
	Chemical	Insecticidal soap	Spray	Structural pests	103 buildings	Spring/summer/fall	———
		Diatomaceous earth	Crack & crevice	Structural pests	103 buildings	Spring/summer/fall	———
		Boric acid	Crack & crevice	Structural pests	103 buildings	Spring/summer/fall	———
		S-Hydroprene	Disc	Structural pests	15 fl oz over 8 applications over 103 buildings	Spring/summer/fall	———
		Indoxacarb (0.1%)	Crack & crevice	Structural pests	7 fl oz over 20 applications over 103 buildings	Spring/summer/fall	———
		Indoxacarb (0.5%)	Crack & crevice	Structural pests	51 fl oz over 23 applications over 103 buildings	Spring/summer/fall	———
		Sodium tetraborate decahydrate	Bait station	Structural pests	11 fl oz over 17 applications over 103 buildings	Spring/summer/fall	———
		Fipronil	Bait station	Structural pests	16 fl oz over 7 applications over 103 buildings	Spring/summer/fall	———
		Cholecalciferol	Bait station	Vertebrate pests	50 oz over 103 buildings	Spring/summer/fall	———
		Prallethrin	Spray	Stinging insects	70 oz (4 cans of spray)	Spring/summer/fall	———

Table 2. District Integrated Pest Management Program – Treatment Actions and Estimates

IPM Management Category	Treatment Type	Treatment Method	Method of Application[1]	Purpose	Annual Application[2]	Timing of Work[3]	Frequency of Work[4]
Recreational Facilities	Manual	Sanitation	———	Stinging insects	———	Spring/summer/fall	———
		Habitat modification	———	Stinging insects, mosquitos, stray wildlife, pets	———	Spring/summer/fall	———
		Traps	Water/lure	Stinging insects, mosquitos, stray wildlife, pets	———	Spring/summer/fall	———
		Nest removal	———	Stinging insects	———	Summer	———
	Manual and Mechanical	Digging & mowing	Hand shovels, brushcutters (manual method in creeks with salmonids)	Ponds, bridges, culverts	1 acre	———	1x per year
	Mechanical	Mowing	Tractors	Roads & road-width trails, facilities	580 acres	May through August	1.5x per year
			Brushcutters	Single track trails	85 acres	May through August	1.5x per year
		Cutting	Chainsaws	Hazard & downed tree removal	50 to 150 trees	———	———
			Chippers	Hazard & downed tree removal	50 to 150 trees	———	———
	Chemical	~~D-trans Allethrin/ Phenothrin~~	~~Spray~~	~~Stinging insects~~	~~420 oz (24 cans of spray)~~	~~Spring/summer/fall~~	~~———~~
		Prallethrin	Spray	Stinging insects	350 oz (20 cans of spray)	Spring/summer/fall	———
		Bacterial pathogens	*Bacillus thuringiensis* var. *israelensis*	Mosquitos	250 disks	May through September	1 disk per 30 days
		Glyphosate IPA	Cut-stump, spot spray, wick, frill/injection	Dam faces, parking lots, gates & stiles, facilities	~~2.4~~ 3 gal over 40 acres	Spring/summer/fall	1x per year
		Glyphosate K	Cut-stump, spot spray, wick, frill/injection	Roads, trails, parking lots, gates & stiles, facilities	1 gal over 54.6 acres	Spring/summer/fall	1x per year
		Clopyralid MEA	Spot spray, cut-stump, frill/injection	Parking lots, gates & stiles, facilities	0.3 gal over 22.9 acres	May through August	1x per year
		Imazapyr IPA	Cut-stump, spot spray, frill/injection	Roads, trails, parking lots, gates & stiles, facilities	0.4 gal over 54.6 acres	Spring/summer/fall	———
Fuel Management	Manual and Mechanical	Mowing & cutting	Tractors, brushcutters, pole pruner, chainsaws, chippers, masticators, jawz implement	Defensible space, fuel break, emergency helicopter landing zones	~~136~~ 140 acres	~~April through June~~ ———	1x per year

Table 2. District Integrated Pest Management Program – Treatment Actions and Estimates

IPM Management Category	Treatment Type	Treatment Method	Method of Application[1]	Purpose	Annual Application[2]	Timing of Work[3]	Frequency of Work[4]
		Discing & cutting	Tractor-pulled instrument, pole pruner	Disc lines	75 acres	April through May	1x per year
	Chemical	Glyphosate K	Cut-stump, spot spray, wick, frill/injection	Defensible space, disc lines, fuel break	~~7.2~~ 3.6 gal over 14 acres	April through June	1x per year
		Triclopyr BEE	Spot spray, cut-stump, basal bark	Defensible space, disc lines, fuel break	3.6 gal over 14 acres	Summer/fall	1x per year
Rangelands and Agricultural Properties	Manual	Weeding, weedmats, crop rotation, mulching	Hand tools	Agricultural weeds	360 acres	Spring/summer	1x per year
		Sanitation, physical barriers, traps	Snap, box traps	Vertebrate pests	360 acres	———	———
	Mechanical	Mowing, discing, cutting, flaming	Tractors, brushcutters, brushrakes, flame equipment	Rangeland weeds, agricultural weeds, brush control	725 acres	Spring/summer/fall	1x per year
	Chemical	Aminopyralid TIPA	Spot spray, cut-stump, basal bark, wick, frill/injection	Rangeland weeds, invasive plant control	~~1.6~~ 2.1 gal over ~~154~~ 174 acres	~~Spring/summer~~ ———	1x per year
		Clopyralid MEA	Spot spray, cut-stump, frill/injection	Rangeland weeds, invasive plant control	1.6 gal over 154 acres	Spring/summer	1x per year
		Glyphosate IPA	Spot spray, cut-stump, wick, frill/injection	Rangeland weeds, brush control, agricultural weeds, invasive plant control	1 gal over 100 acres	Spring/summer	1x per year
		Glyphosate K	Spot spray, cut-stump, wick, frill/injection	Rangeland weeds, brush control, agricultural weeds, invasive plant control	57.6 gal over 154 acres	Spring/summer	1x per year
		Triclopyr BEE[5]	Spot spray, cut-stump, basal bark	Rangeland weeds, brush control, agricultural weeds, invasive plant control	6.6 gal over 154 acres	Spring/summer/fall	1x per year
		Triclopyr TEA/ Aminopyralid TIPA	Spot spray, cut-stump, frill/injection	Rangeland weeds, invasive plant control	20 gal over 174 acres	———	1x per year
Natural Lands	Manual	Digging, hoeing, hand pulling	———	Invasive plant control	~~30~~ 50 acres	———	1x per year
		Biocontrol insects	Hairy weevils	Invasive plant control	800 acres	———	1x per year
		Sanitation	———	Invasive plant control	———	———	———
		Prevention	———	Invasive plant control	———	———	———

Table 2. District Integrated Pest Management Program – Treatment Actions and Estimates

IPM Management Category	Treatment Type	Treatment Method	Method of Application[1]	Purpose	Annual Application[2]	Timing of Work[3]	Frequency of Work[4]
		Habitat modification	———	Invasive plant control	———	———	———
		Traps	———	Invasive animal control	———	———	———
	Manual and Mechanical	Cutting	Weed wrenches, hand saws, clippers, brushcutters, pole pruner, chainsaws, chippers, masticators, jawz implement	Sudden oak death, invasive plant control	~~2~~ 10 acres	———	1x per year
	Mechanical	Flaming	———	Invasive plant control	2 acres	———	———
		Mowing	Tractors, mowers, brushcutters	Invasive plant control	10 acres	———	———
	Chemical	Glyphosate IPA	Spot spray, cut-stump, wick, frill/injection	Invasive plant control	1 gal over 100 acres	Spring/summer	1x per year
		Glyphosate K	Spot spray, cut-stump, wick, frill/injection	Invasive plant control, sudden oak death	~~119.2~~ 71.5 gal over 955 acres	Spring/summer	1x per year
		Clethodim	Spot spray	Invasive plant control	1.8 gal over 243 acres	Spring/summer	1x per year
		Aminopyralid TIPA	Spot spray, cut-stump, basal bark, wick, frill/injection	Invasive plant control	~~1.7~~ 2 gal over ~~164~~ 174 acres	~~Spring/summer~~ ———	1x per year
		Clopyralid MEA	Spot spray, cut-stump, frill/injection	Invasive plant control	1.7 gal over 164 acres	Spring/summer	1x per year
		Imazapyr IPA	Spot spray, cut-stump, frill/injection	Invasive plant control, sudden oak death	0.35 gal over 8 acres	Spring/summer	1x per year
		Phosphite K Salts, mono-/di-	Spray, inject	Sudden oak death	45 gallons concentrate over 30 acres	April/May or October/November	1x per year
		Triclopyr BEE[5]	Spot spray, cut-stump, basal bark	Invasive plant control	54.6 gal over 955 acres	Spring/summer/fall	1x per year
		Triclopyr TEA/ Aminopyralid TIPA	Spot spray, cut-stump, frill/injection	Invasive plant control	17.5 gal over 164 acres	———	1x per year

[1] All applications are made according to product label instructions and may include methods not listed here.

[2] Herbicide quantities are expressed as volume of concentrate, i.e. volume of undiluted product.

[3] No value indicates treatment method may be applied anytime during the year

[4] No value indicated treatment method may be applied multiple times throughout the year as needed

[5] See Garlon® 4 Ultra label - must be used in other sites that are within a rangeland. Cows not to be lactated for one season.

Source: District 2014c; Sifuentes-Winter, C., District 2017, Pers comm, Email RE: CEQA - Table 3-1 Update

This Addendum also includes clarifications to the BMPs (Draft EIR, Table 3-4, p. 3-36 - 3-39) and one mitigation measure, as well as the addition of six new BMPs. The purpose of the proposed BMP and mitigation measure modifications is to clarify existing language, outline practices already being carried out by District staff, further increase the protection and safety of humans and the environment, and further reduce the level of impact associated with impacts that were already considered less than significant in light of these BMPs and mitigation measures. As such, it is important to note that these revisions are not a result of newly identified adverse impacts and do not substantially affect the current IPMP or other proposed program modifications.

This proposed Addendum also considers potential impacts of the IPMP on the California giant salamander and the Santa Cruz black salamander.

The purpose of this proposed Addendum is to consider whether these modifications to the project or changed conditions would result in the need for a subsequent or supplemental MND or EIR under CEQA (Public Resources Code, section 21166; CEQA Guidelines, sections 15162, 15164). An environmental checklist (based on Appendix G of the CEQA Guidelines) has been used to analyze potential environmental impacts associated with the above modifications to the project and changed circumstances under which it would be undertaken, determine whether any new impacts could occur compared to those identified in the prior EIR, and evaluate the mitigation measures adopted for the previously approved project to determine which one(s) is/are applicable to the modified project.

As previously mentioned, the IPMP is intended to be used for at least 10 years. During that time period, it is expected that the District's IPM activities will increase at an approximate rate of 1% per year to accommodate the purchase of additional land. This increase is considered in the current analysis.

The following provides a description of the proposed modifications to the previously approved project, and the newly listed Species of Special Concern which constitute changed circumstances under which the project would be undertaken. All proposed project modifications are located on previously affected land located within the project site analyzed in the 2014 EIR.

3.1 PESTICIDE USE

The proposed modifications to the District's IPMP include use of two new herbicidal active ingredients – triclopyr BEE (Garlon 4 Ultra) and triclopyr TEA (Capstone) – and one new insecticidal active ingredient – prallethrin (PT Wasp-Freeze II) – on District lands.

The pyridine herbicides triclopyr BEE and triclopyr TEA are derived from triclopyr acid and used to control annual and perennial broadleaf weeds and woody plants in agricultural and nonagricultural areas (Capstone Label, 2015; Garlon 4 Ultra Label, 2008). Both active ingredients act as plant growth regulators that function by mimicking the auxin growth hormone in plants and disrupting normal plant growth. Triclopyr BEE and triclopyr TEA are both selective, post-emergent, systemic herbicides; however, triclopyr TEA may also be used as a pre-emergent herbicide and is labeled for use near water. Note that the triclopyr TEA product intended to be used by the District, Capstone, contains both triclopyr TEA and aminopyralid TIPA. In contrast, triclopyr TEA is the sole active ingredient in products such as Garlon® 3A. When the use of Capstone is considered, information on both triclopyr TEA and aminopyralid should be reviewed. The District intends to apply Garlon 4 Ultra via spot spray, cut-stump, and basal bark treatment, and Capstone via spot spray, cut-stump, and frill/injection. Note that aminopyralid was previously evaluated in the 2014 EIR.

Prallethrin is a synthetic pyrethroid insecticide used to control bees, hornets, yellowjackets, spiders, and wasps. In agricultural settings, prallethrin is registered for use for applications over, near, and around agricultural areas as a wide-area mosquito adulticide (USEPA, 2014). Prallethrin causes paralysis in insects by modulating sodium channels and disrupting nerve impulses. The District intends to use PT Wasp-Freeze II as needed and in a manner similar to its current use of PT Wasp-Freeze (i.e., via aerosol spray). It would only

be used if the insects are a health and safety risk to District employees or the public. The previously approved product PT Wasp-Freeze would no longer be used under the IPMP.

Pesticide application methods proposed for use under the IPMP include:

- *Basal bark application*: Using this treatment method, an oil mixture containing herbicide would be applied to the lower 12 to 15 inches of brush and tree trunks (including the entire stem, root collar area, and exposed roots) via low-pressure backpack sprayer. This method would be used to selectively control woody plants with basal stems less than six inches in diameter.

- *Wick application*: A wick or rope would be saturated in herbicide and attached to a reservoir containing a concentrated herbicide solution. The wick or rope is used to wipe herbicide directly onto target plants, typically weeds that are taller than surrounding non-target plants. Wick applicators may range in size from hand-held to truck-mounted.

- *Frill/injection application*: A drill or sharp tool such as a hatchet would be used to create holes or cuts through the exterior bark of a tree and into the sapwood. Each penetration point into the sapwood is then filled with the label-recommended amount of concentrated herbicide solution using an injection system, squirt bottle, or brush. This application method is often used for the control of trees that cannot be managed via basal bark application.

All proposed pesticide uses would occur within previously treated land within District boundaries. Refer to Table 3 for a summary of modes of action and intended purposes of active ingredients already in use and proposed for use under the IPMP. The proposed pesticides are similar in both mode of action and purpose to pesticides already in use by the District. The additional proposed pesticide application methods do not differ substantially from methods used by the District and approved by the 2014 EIR.

Table 3. Pesticides Selected to Support the District's IPMP

Pesticide Category	Active Ingredient	Product Formulations (Manufacturer)	Mode of Action	Purpose
Adjuvants/ Surfactants	Alcohol Ethoxylate	Liberate® (Loveland Products, Inc.)	Enhances uptake of herbicides and pesticides	Increase delivery and efficacy of pesticides to targets
	Alkylphenol Ethoxylate	Pentra-Bark® (Quest)	Enhances uptake of Agri-Fos	Increase delivery of Agri-Fos to trees
	Lecithin	Liberate (Loveland Products, Inc.)	Enhances uptake of herbicides and pesticides	Increase delivery and efficacy of pesticides to targets
	Canola Oil, Ethyl and Methyl Esters	Competitor® (Wilbur-Ellis)	Decrease surface tension, increase herbicide uptake, enhance wetting and spreading	Increase delivery and efficacy of pesticides to targets
Fungicides	Phosphite K Salts, mono-/di-	Agri-Fos® (AgBio)	Fungal oxidative phosphorylation inhibitor	Prevents sudden oak death
Herbicides	Aminopyralid TIPA	Milestone (Dow AgroSciences)	Auxin growth hormone mimic	Nonselective post-emergent broad-spectrum weed control
	Clethodim	Envoy Plus™ (Valent)	Fatty acid synthesis inhibitor	Selective post-emergent grass weed control
	Clopyralid MEA	Transline (Dow AgroSciences)	Auxin growth hormone mimic	Selective broadleaf weed control
	Glyphosate IPA	Roundup Custom (Monsanto)	Amino acid synthesis inhibitor	Nonselective post-emergent broad-spectrum weed and tree control
	Glyphosate K	Roundup ProMax (Monsanto)	Amino acid synthesis inhibitor	Nonselective post-emergent broad-spectrum weed and tree control
	Imazapyr IPA	Polaris (Nufarm), Stalker® (BASF)	Amino acid synthesis inhibitor	Nonselective pre-and post-emergent broad-spectrum weed and tree control
	Triclopyr BEE	Garlon 4 Ultra (Dow AgroSciences)	Auxin growth hormone mimic	Selective post-emergent woody plant, broadleaf weed, and tree control
	Triclopyr TEA	Capstone (Dow AgroSciences)	Auxin growth hormone mimic	Selective pre- and post-emergent broadleaf weed, woody plant, and tree control
Insecticides	Diatomaceous Earth	Diatomaceous Earth	Water balance disruptor	Structural pest control (e.g., ants, cockroaches)
	D-trans Allethrin	PT Wasp-Freeze (BASF)	Voltage-gated sodium channel interference	Wasp and hornet control
	Fipronil	Maxforce® Bait Stations (Bayer)	GABA-gated chloride channel blocker	Ant control
	Indoxacarb	Advion® Gel Baits (DuPont)	Sodium channel blocker	Structural pest control (e.g., ants, cockroaches)
	Phenothrin	PT Wasp-Freeze (BASF)	Voltage-gated sodium channel interference	Wasp and hornet control
	Prallethrin	PT Wasp-Freeze II (BASF)	Voltage-gated sodium channel interference	Wasp and hornet control
	S-Hydroprene	Gentrol Point Source® (Wellmark International)	Juvenile growth hormone mimic	Pest control (e.g., cockroaches, beetles, moths)
	Sodium Tetraborate Decahydrate	Prescription Treatment Baits (BASF), Terro® Ant Killer II (Terro)	Water balance disruptor	Ant control
Rodenticides	Cholecalciferol	Cholecalciferol baits	Calcification of soft tissues	Rodent pest control (e.g., rats, mice)

3.2 BEST MANAGEMENT PRACTICES AND MITIGATION MEASURES

The BMPs which appear in Table 3-4 of the EIR have been modified in **Table 4** as follows (changes shown in underline/~~strikeout~~):

Table 4. District BMPs for IPMP

BMP ID#	Best Management Practices
1	All pesticide use shall be implemented consistent with written Pest Control Recommendations prepared annually by a licensed Pest Control Advisoer. The Pest Control Adviser shall ensure that all pesticide applications are performed at the time of year and phenological window for maximum effectiveness, thereby increasing treatment efficacy and reducing the need for follow-up applications.
2	~~Surfactants and other~~ Adjuvants shall be used and applied consistent with the District's Pest Control Recommendations.
3	Applicators shall follow all pesticide label requirements and refer to all other BMPs regarding mandatory measures to protect sensitive resources and employee and public health during pesticide application. All District field crew who perform herbicide treatments shall have specialized experience and training in pesticide safety, IPM principles, and special status species.
4	Pesticide applicators shall have or work under the direction of a person with a Qualified Applicator License (QAL) or Qualified Applicator Certificate (QAC). As appropriate, the District shall implement QAC certification requirements for additional field staff to enhance field crew training. Contractors and grazing and agricultural tenants may apply approved pesticides ~~herbicides~~ after review and approval by the District and under the direction of QAL/QAC field supervisors. After review and approval by the District and under the direction of QAL/QAC, contractors may apply approved fungicides to District preserves for the research and control of Sudden Oak Death (SOD). As needed for the control of mosquitos, cattle grazing rangers may apply District-approved bacterial pathogens to water troughs in District preserves. Employees, contractors and tenants may install approved ant and roach bait stations inside buildings in tamper-proof containers without review by a QAL/QAC. Tenants may not use rodenticides; only qualified District staff or District contractors may use approved rodenticides and these should only be used in the event of an urgent human health issue, in a manner consistent with the product label, and in anchored, tamper-proof containers inside buildings.
5	All storage, loading and mixing of pesticides shall be set back at least 300 feet from any aquatic feature or special-status species or their habitat or sensitive natural communities. Applicators shall use an air gap or anti-siphon device to prevent backflow while loading. All mixing and transferring shall occur within a contained area. Any transfer or mixing on the ground shall be within containment pans or over protective tarps and away from drain inlets, culverts, wells, areas with porous or erosion-prone soil, or other features that may allow for runoff.
6	As deemed necessary by the Pest Control Adviser, QAL, or QAC, Aappropriate, non-toxic colorants or dyes shall be added to the herbicide mixture to determine treated areas and prevent over-spraying, particularly in public areas.
7	Application Requirements - The following general application parameters shall be employed during ~~herbicide~~ pesticide application: ◢ Application shall cease when weather parameters exceed label specifications, when wind at site of application exceeds 7 miles per hour (MPH), or when precipitation (rain) occurs or is forecasted with greater than a 40 percent probability in the next 24-hour period to prevent ~~sediment and herbicides from entering the~~ loss of efficacy and lessen the potential for pesticides to enter surface water ~~via surface runoff~~; ◢ All restrictions and limitations, including those on irrigation, cultivation, re-entry, etc., as described on the pesticide product label shall be followed for sites treated with pesticides; ◢ Spray nozzles shall be configured to produce a relatively large droplet size; ◢ Low nozzle pressures (30-70 pounds per square inch [PSI]) shall be observed; ◢ Spray nozzles shall be kept within 24 inches of vegetation during spraying; ◢ Application equipment shall be calibrated periodically per manufacturer specifications or frequently enough such that equipment is applying pesticides according to label directions; ◢ Drift and overspray avoidance measures shall be used to prevent drift in all locations. Particular attention shall be paid to areas where target weeds and pests are in proximity to special-status species or their habitat. Such measures can consist of, but would not be limited to the use of plastic shields around target weeds and pests and ~~adjusting the spray nozzles of application equipment to limit the spray area~~ selecting and using appropriate spray nozzles and pressures. Spray areas may also be limited by using application methods such as spot treatments and thin line treatments of one-inch wide or less.

Table 4. District BMPs for IPMP

BMP ID#	Best Management Practices
	◢ Due to the potential presence of temperature inversion layers, no spraying shall be conducted on designated "Spare the Air" days.
8	Notification of Pesticide Application – Signs shall be posted notifying the public, employees, and contractors of the District's use of pesticides. The signs shall consist of the following information: ~~signal word,~~ product name, signal word, and manufacturer, active ingredient,; and EPA registration number; target pest; preserve name; treatment location in preserve; date and time of application; date which notification sign may be removed; and contact person with telephone number. Signs shall generally be posted 24 hours before the start of treatment and notification shall remain in place for 72 hours after treatment ceases. In no event shall a sign be in place longer than 14 days without dates being updated. See the IPM Guidance Manual for details on posting locations, posting for pesticide use in buildings and for exceptions.
9	Disposal of Pesticide Containers – ~~Disposal~~ Cleanup of all ~~herbicide~~ pesticide and adjuvant containers shall follow the product label and local waste disposal regulations. This generally consists of ~~be~~ triple rinsing with clean water at an approved site and ~~the rinsate shall be disposed of by placing it in~~ adding the rinsate to the batch tank for application. Used containers shall be punctured on the top and bottom to render them unusable, unless said containers are part of a manufacturer's container recycling program, in which case the manufacturer's instructions shall be followed. Disposal of non-recyclable containers shall be at legal dumpsites. Equipment shall not be cleaned and personnel shall not bathe in a manner that allows contaminated water to directly enter any body of water within the treatment areas or adjacent watersheds. ~~Disposal of all pesticide containers shall follow label requirements and local waste disposal regulations.~~
10	All appropriate laws and regulations pertaining to the use of pesticides and safety standards for employees and the public, as governed by the U.S. Environmental Protection Agency, the California Department of Pesticide Regulation, and local jurisdictions shall be followed. All applications shall adhere to label directions for application rates and methods, storage, transportation, mixing, and container disposal. All contracted applicators shall be appropriately licensed by the state. District staff shall coordinate with the County Agricultural Commissioners, and all required licenses and permits shall be obtained prior to pesticide application.
11	Sanitation and Prevention of Contamination - All personnel working in infested areas shall take appropriate precautions to not carry or spread weed seed or SOD-associated spores outside of the infested area. Such precautions will consist of, as necessary based on site conditions, cleaning of soil and plant materials from tools, equipment, shoes, clothing, or vehicles prior to entering or leaving the site.
12	All staff, contractors, and volunteers shall be properly trained to prevent spreading weeds and pests to other sites.
13	District staff shall appropriately maintain facilities where tools, equipment, and vehicles are stored free from invasive plants.
14	District staff shall ensure that rental equipment and project materials (especially soil, rock, erosion control material and seed) are free of invasive plant material prior to their use at a worksite.
15	Suitable onsite disposal areas shall be identified to prevent the spread of weed seeds.
16	Invasive plant material shall be rendered nonviable when being retained onsite. Staff shall desiccate or decompose plant material until it is nonviable (partially decomposed, very slimy, or brittle). Depending on the type of plant, disposed plant material can be left out in the open as long as roots are not in contact with moist soil, or can be covered with a tarp to prevent material from blowing or washing away.
17	District staff shall monitor all sites where invasive plant material is disposed on-site and treat any newly emerged invasive plants.
18	When transporting invasive plant material off-site for disposal, the plant material shall be contained in enclosed bins, heavy-duty bags, or a securely covered truck bed. All vehicles used to transport invasive plant material shall be cleaned after each use.
19	Aquatic Areas – Shortly before treatment, ~~A~~a District-approved qualified biologist or other District-approved personnel shall survey ~~all~~the treatment site~~s prior to work~~ to determine whether any aquatic features are located onsite. In addition, o~~O~~n a repeating basis, grassland treatment sites shall be surveyed once every five years and brushy and wooded sites shall be surveyed by a District-approved biologist once every five years. Brush removal on rangelands will require biological surveys before work is conducted in any year. Aquatic features are defined as any natural or manmade lake, pond, river, creek, drainage way, ditch, spring, saturated

Table 4. District BMPs for IPMP

BMP ID#	Best Management Practices
	soils, or similar feature that holds water at the time of treatment or typically becomes inundated during winter rains. Treatment sites are defined as areas where IPM activity, including manual, mechanical, and chemical treatment, is expected to occur. If during the survey it is found that aquatic features are present within 15 feet of the proposed treatment area, the District shall either eliminate all treatment activities within 15 feet of the aquatic feature from the project (i.e. do not implement treatment actions in those areas) or if the District chooses to continue treatment actions in these areas, it shall use pesticides and adjuvants labeled for aquatic use and follow the requirements of the mitigation measure for special-status wildlife species and the CDFW Streambed Alteration Agreement.
20	Application of ~~herbicides~~ pesticides shall be conducted in accordance with the California Red-Legged Frog Injunction (Center For Biological Diversity v. U.S. Environmental Protection Agency (2006) Case No.: 02-1580-JSW) in known or potential California red-legged frog habitat specifically by: not applying specified pesticides within 15 feet of aquatic features (including areas that are wet at time of spraying or areas that are dry at time of spraying but subsequently might be wet during the next winter season); utilizing only spot-spraying techniques and equipment by a certified applicator or person working under the direct supervision of a certified applicator; and not spraying during precipitation or if precipitation is forecast to occur within 24 hours before or after the proposed application. Preserves in which these precautions must be undertaken are: Miramontes Ridge, Purisima Creek Redwoods, El Corte de Madera, La Honda Creek, Picchetti Ranch, Russian Ridge, Sierra Azul, Tunitas Creek, Skyline Ridge, Rancho San Antonio, Monte Bello and Coal Creek OSPs and Toto Ranch.
21	A District-approved biologist shall survey all selected treatment sites ~~prior to~~ shortly before work to determine site conditions and develop any necessary site-specific measures. Treatment sites are defined as areas where IPM activity, including manual, mechanical, and chemical treatment, is expected to occur. In addition, ~~on~~ a repeating basis, grassland treatment sites shall be surveyed by a District-approved biologist once every five years and brushy and wooded sites shall be surveyed once every five years. Brush removal on rangelands will require biological surveys before work is conducted in any year. Site inspections shall evaluate existing conditions at a given treatment site including the presence, population size, growth stage, and percent cover of target weeds and pests relative to native plant cover and the presence of special-status species and their habitat, or sensitive natural communities. In addition, annual worker environmental awareness training shall be conducted for all treatment field crews and contractors for special-status species and sensitive natural communities determined to have the potential to occur on the treatment site by a District approved biologist. The education training shall be conducted prior to starting work at the treatment site and upon the arrival of any new worker onto sites with the potential for special-status species or sensitive natural communities. The training shall consist of a brief review of life history, field identification, and habitat requirements for each special-status species, their known or probable locations in the vicinity of the treatment site, potential fines for violations, avoidance measures, and necessary actions if special-status species or sensitive natural communities are encountered.
22	Nesting Birds - For all IPM activities that could result in potential noise and other land disturbances that could affect nesting birds (e.g., tree removal, mowing during nesting season, mastication, brush removal on rangelands), treatment sites shall be surveyed within two weeks prior to initiating activity to evaluate the potential for nesting birds. Tree removal will be limited, whenever feasible, based on the presence or absence of nesting birds. For all other treatments, if birds exhibiting nesting behavior are found within the treatment sites during the bird nesting season: March 15 – August 30 for smaller bird species such as passerines and February 15 - August 30 for raptors, impacts on nesting birds will be avoided by the establishment of appropriate buffers around active nests. The distance of the protective buffers surrounding each active nest site are: ~~500~~ 1,000 feet for large raptors such as buteos, ~~250~~ 500 feet for small raptors such as accipiters, and 250 feet for passerines. The size of the buffer may be adjusted by a District biologist in consultation with CDFW and USFWS depending on site specific conditions. Monitoring of the nest by a District biologist during and after treatment activities will be required if the activity has potential to adversely affect the nest. These areas can be subsequently treated after a District biologist or designated biological monitor confirms that the young have fully fledged, are no longer being fed by the parents and have left the nest site. For IPM activities that clearly would not have adverse impacts to nesting birds (e.g. treatments in buildings and spot spraying with herbicides), no survey for nesting birds would be required.

Table 4. District BMPs for IPMP

BMP ID#	Best Management Practices
23	San Francisco dusky-footed woodrat and Santa Cruz kangaroo rat – All District staff, volunteers or contractors who will implement treatment actions shall receive training from a qualified biologist on the identification of dusky-footed woodrat, Santa Cruz kangaroo rat, and their nests or burrows. Generally, all San Francisco dusky-footed woodrat and their nests, and Santa Cruz kangaroo rat and their burrows ~~nests~~ will be avoided and left undisturbed by proposed work activities. If a nest site or burrow will be affected, the District will consult with CDFW. Rodenticides, snap traps, and glue boards shall not be used in buildings within 100 feet of active San Francisco dusky-footed woodrat nests or Santa Cruz kangaroo rat ~~nests~~ burrows; instead rodent control in these areas will be limited to non-lethal exclusion and relocation activities including relocation of nests if approved by CDFW. Tenants will contact the District for assistance in managing rat populations in buildings and under no circumstances will be allowed to use rodenticides.
24	Where appropriate, equipment modifications, mowing patterns, and buffer strips shall be incorporated into manual treatment methods to avoid disturbance of grassland wildlife.
25	Rare Plants – Shortly before treatment, a~~A~~ll selected treatment sites shall be surveyed by District-approved personnel with environmental awareness training (BMP #20) prior to work to determine the potential presence of special-status plants. Rare plant surveys shall also be conducted during the appropriate season to assess the occurrence, if any, of dormant or overwintering plant species that may not be visible during the pre-treatment survey. If special-status plants are reported, information such as species and location shall be uploaded into an electronic inventory system and a biomonitor shall be present to oversee the planned IPM treatment. On a repeating basis, grassland treatment sites shall be surveyed by a District-approved biologist once every five years and brushy and wooded sites shall be surveyed once every five years. Brush removal on rangelands will require biological surveys before work is conducted in any year. Treatment sites are defined as areas where IPM activity, including manual, mechanical, and chemical treatment, is expected to occur. A ~~15~~30-foot buffer shall be established from special-status plants. No application of herbicides shall be allowed within this buffer. Non-herbicide methods can be used within ~~15~~30 feet of rare plants but they shall be designed to avoid damage to the rare plants (e.g., pulling).
26	Cultural Resources – District staff, volunteer crew leaders, and contractors implementing treatment activities shall receive training on the protection of sensitive archaeological, paleontological, or historic resources (e.g., projectile points, bowls, baskets, historic bottles, cans, trash deposits, or structures). In the event volunteers would be working in locations with potential cultural resources, staff shall provide instruction to protect and report any previously undiscovered cultural artifacts that might be uncovered during hand-digging activities. If archaeological or paleontological resources are encountered on a treatment site and the treatment method consists of physical disturbance of land surfaces (e.g., mowing, brush cutting, pulling, or digging), work shall avoid these areas or shall not commence until the significance of the find can be evaluated by a qualified archeologist. This measure is consistent with federal guidelines 36 CFR 800.13(a), which protects such resources in the event of unanticipated discovery.
27	Post-Treatment Monitoring – District staff shall monitor IPM activities within two months after herbicide treatment (except for routine minor maintenance activities which can be evaluated immediately after treatment) to determine if the target pest or weeds were effectively controlled with minimum ~~effect~~ impact to the environment and non-target organisms. Future treatment methods in the same season or future years shall be designed to respond to changes in site conditions.
28	Erosion Control and Revegetation - For sites with loose or unstable soils, steep slopes (greater than 30 percent), where a large percentage of the groundcover will be removed, or near aquatic features that could be adversely affected by an influx of sediment, erosion control measures shall be implemented before or after treatment as appropriate. These measures could consist of the application of forest duff or mulches, straw bales, straw wattles, other erosion control material, seeding, or planting of appropriate native plant species to control erosion, restore natural areas, and prevent the spread or reestablishment of weeds. Prior to the start of the winter storm season, these sites shall be inspected to confirm that erosion control techniques are still effective. When possible, applicators may select vegetation control techniques ~~select herbicides~~ to maintain sufficient vegetative cover to mitigate erosion.
29	Operation of noise-generating equipment (e.g., chainsaws, wood chippers, brush-cutters, pick-up trucks) shall abide by the time-of-day restrictions established by the applicable local jurisdiction (i.e., City and/or County) if such noise activities would be audible to receptors (e.g., residential land uses, schools, hospitals, places of

Table 4. District BMPs for IPMP

BMP ID#	Best Management Practices
	worship) located in the applicable local jurisdiction. If the local, applicable jurisdiction does not have a noise ordinance or policy restricting the time-of-day when noise-generating activity can occur, then the noise-generating activity shall be limited to two hours after sunrise and two hours before sunset, generally Monday through Friday. Additionally, if noise-generating activity would take place on a site that spans over multiple jurisdictions, then the most stringent noise restriction, as described in this BMP or in a local noise regulation, would apply. For IPM sites where the marbled murrelet has the potential to nest, as identified in the District's 2014 maps (see attachment) if noise-generating activities would occur during its breeding season (March 24 to September 15), the IPM activities would be subject to the noise requirements listed in the most current in the CDFW RMA issued to the District (see attachment).
30	All motorized equipment shall be shut down when not in use. ~~Idling of e~~Equipment and off-highway vehicles~~ idling~~ will be limited to 5 minutes.
31	Grazing Animals – Some herbicides, such as Milestone, Transline, and Capstone contain label language restricting grazing and/or use of compost. Always read and follow label directions.
32	Surface and Groundwater Protection – Applicators shall use BMPs regarding the prevention of drift, runoff, erosion, and water quality impairment. All work shall be in compliance with the 3 CCR § 6800 (Groundwater Protection). When possible, plant covers such as landscaping shall be established on bare soil and hillsides to minimize pesticide and sediment runoff. Pesticides without an aquatic label shall not be applied to: 1) permeable soils, soils prone to or with evidence of erosion without containment strategies (e.g., vegetative buffers, sediment barriers); or 2) in areas where aquatic habitats are located within 15 feet of the application site. In no cases should pesticides be applied to surface water bodies unless appropriate permits are obtained.
33	Application of glyphosate and cholecalciferol shall be conducted in accordance with the Goby -11 Injunction (Center for Biological Diversity v. EPA, Case No. 07-2794-JCS (N.D. Cal.), May 30, 2007) in applicable and relevant habitats for those species named in the Injunction that occur within the District. Applicable habitats for each species named in the Injunction are defined in the 2010 court order for the Center for Biological Diversity v. EPA. Because the interim protective measures (i.e., no-use buffer zones adjacent to certain features within certain geographic areas) established in the 2010 order vary depending on the species at issue and the pesticide being used, the USEPA webpage should be consulted: https://www.epa.gov/endangered-species/interim-use-limitations-eleven-threatened-or-endangered-species-san-francisco-bay. In addition, District internal special status species mapping resources, buffer zones established on the CNDDB webpage, and an interactive species location map (https://www.epa.gov/endangered-species/san-francisco-bay-area-map-tool-identify-interim-pesticide-use-limitations) should be consulted. The interim use limitations remain in effects until USEPA completes effects determinations for four pesticides named under the 2015 revised settlement agreement for the Center for Biological Diversity v. EPA. The effects determinations are expected to be completed by 2020.
34	Glyphosate Use Reduction – Where feasible, the District shall reduce the use of glyphosate in its preserves. For IPM projects currently utilizing glyphosate as a management tool, the District shall identify suitable sites to implement alternative treatment methods. The District shall seek to replace glyphosate with the safest available, broad-spectrum, post-emergent herbicide with minimal residual soil activity.
35	Trails – To reduce potential staff and visitor exposure to pesticides, no-spray trail buffers shall be established at least 5 feet from any trails, trailheads, or parking lots unless a 24-hour trail closure is observed.
36	Annual Pesticide Literature Review – To inform updates to the IPM Program, the District shall conduct an annual pesticide literature review of all newly published toxicological research and court proceedings related to pesticides on the "Approved Pesticides List."

In addition, the Mitigation Measure 4.2-1a has been modified because the list of Species of Special Concern, for which the mitigation measure was intended to be all-inclusive, is no longer accurate in light of the listing of California giant salamander, and Santa Cruz black salamander (changes shown in underline/~~strikeout~~):

Mitigation Measure 4.2-1a: Mitigation for impacts to special-status amphibian and reptile species (California red-legged frog, foothill yellow-legged frog, northern western pond turtle, San Francisco garter snake, California tiger salamander, California giant salamander, Santa Cruz black salamander).

Prior to conducting any mechanical or chemical IPM treatments in an area that is both federally designated critical habitat and suitable aquatic habitat for California red-legged frog, foothill yellow-legged frog, northern western pond turtle, San Francisco garter snake, or California tiger salamander, the District will consult with the USFWS and CDFW as appropriate pursuant to ESA/CESA. Appropriate measures will be developed in consultation with USFWS and CDFW to ensure there is no loss of critical habitat for these species, or that unavoidable loss of critical habitat will be replaced through habitat enhancement or restoration. Such measures may include avoidance of breeding habitat, limiting activities to manual removal of vegetation, conducting activities outside the breeding season, or relocation and mitigation.

Prior to conducting any mechanical or chemical IPM treatments within 15 feet of occupied habitat for California red-legged frog, foothill yellow-legged frog, northern western pond turtle, San Francisco garter snake, California tiger salamander, California giant salamander, or Santa Cruz black salamander, the District will consult with USFWS and CDFW. Appropriate measures will be developed in consultation with USFWS and CDFW to ensure there is no take of these species, or that unavoidable take is fully compensated for through habitat enhancement or restoration activities, or purchase of mitigation credits. Shooting, trapping, and gigging of aquatic species will be conducted only by a qualified biologist with experience in the identification of frog and turtle species. Inadvertently trapped California red-legged frogs, foothill yellow-legged frogs or northern western pond turtles will be released immediately upon discovery.

If permanent loss of federally designated critical habitat cannot be avoided, compensation will be provided through protection and enhancement of habitat within the District open space, purchase of offsite mitigation credits, and/or contribution to regional conservation and recovery efforts for the species as determined in consultation with the USFWS and CDFW.

3.3 SPECIES OF SPECIAL CONCERN

Changed circumstances under which the District's IPMP would be implemented include two salamanders recently listed by CDFW as Species of Special Concern: the California giant salamander and the Santa Cruz black salamander (CDFW, 2017).

California giant salamanders can be found in north-central California, primarily in or near streams within humid coastal forests with Douglas fir, redwood, red fir, and montane and valley-foothill riparian habitats (CDFW, 1997). Within these habitats, California giant salamanders are often found hiding between streambed rocks, under fallen leaves, or in underground burrows. Terrestrial adults feed on invertebrates such as snails and slugs and small vertebrates such as mice. In aquatic habitats, adults and larvae may prey on aquatic invertebrates, fish, and other amphibians. California giant salamanders breed in spring and lay eggs in concealed locations within cold, slow-flowing streams (CDFW, 1997; Nussbaum and Clothier, 1973). Aquatic larvae transform to terrestrial adults one to two years after hatching (Nussbaum and Clothier, 1973). California giant salamanders are primarily nocturnal (CDFW, 1997).

The terrestrial Santa Cruz black salamanders occur in the mesic forests and woodlands of the Santa Cruz Mountains in western Santa Clara, northern Santa Cruz, and southern San Mateo Counties (Thomson et al., 2016). They are often found in shallow standing water or seeps within moist streamside microhabitats. They have been seen under stones along stream edges and in talus formations or rock rubble. No information is available on the feeding behavior of Santa Cruz black salamanders; however, they are presumed to be

generalized predators of small arthropods and other invertebrates. Females lay eggs underground during the summer and stay with eggs until they hatch.

While the 2014 EIR evaluated potential impacts to biological resources from the perspective of habitat modification, the current analysis would also consider direct effects that both proposed and existing pesticides in the IPMP have on special status species or their surrogates by evaluating risk as it relates to toxicity and exposure. The California giant salamander and Santa Cruz black salamander have similar diets, habitats, and distribution as the California tiger salamander, which was included in the 2014 EIR analysis. Table 5 provides a comparison of various characteristics of the salamander species known to occur on District lands.

Table 5. Comparison of District Salamander Species

Characteristics	California Tiger Salamander (*Ambystoma californiense*)	Santa Cruz Black Salamander (*Aneides flavipunctatus niger*)	California Giant Salamander (*Dicamptodon ensatus*)
Life Stages	Eggs hatch in ~10-14 d. Larvae require significantly more time to transform into juveniles than other amphibians. Around late spring, salamanders leave the ponds to find burrows. Adults reach sexual maturity in 4-5 yr. They are large and stocky with a broad, rounded snout. They are black in color with white or pale yellow spots.	Little is published on the ecological and life history of this species. Eggs undergo direct development, and fully formed juveniles appear at the surface shortly after the onset of fall rains, often in October or November. Juveniles have brassy dorsal coloration with white or light blue spots. Adults are either solid black or black with a few small white flecks.	The larval stage lasts ~18 mo. Larval dorsal coloration is light brown with a pale eye strip behind each eye. Larvae reach 10 cm within a year of hatching and metamorphose in late summer. Adults are tan to light reddish brown with coppery tan to dark brown irregular marbling. Marbling coloration is often brighter in young metamorphs than in adults.
Diet	Adults mostly eat insects. Larvae eat things such as algae, mosquito larvae, tadpoles and insects.	No diet information has been published. It is presumed that this species is a generalized predator of small arthropods and other invertebrates.	Adults feed on vertebrates such as other salamanders, lizards, mice, shrews, and voles, and invertebrates such as land snails, beetles, and crickets. Larvae are presumed to consume aquatic insects and other invertebrates.
Habitat	Restricted to vernal pools and seasonal ponds, including many constructed stock ponds, in grassland and oak savannah plant communities, predominantly from sea level to 2,000 ft. Prefer natural ephemeral pools or ponds that mimic them. Live underground, using burrows made by burrowing mammals.	Restricted to mesic forests in the fog belt of the outer Coast Range. Occur in moist streamside microhabitats and found in shallow standing water or seeps, under stones along stream edges and boards near creeks. Also occur in talus formations or rock rubble. Spend the majority of time underground.	Occur in mesic coastal forests (oak woodland and coniferous forest) and coastal chaparral habitats. Adults are occasionally found surface active or under cover objects in wet conditions.
Travel/Activity	Enter a dormant state called estivation during the dry months. They come out of their burrow around November. Nocturnal.	Most active on the surface at night, and more so during rain events.	Primarily nocturnal, but may also be active during daytime. Most active during rain events.
Breeding	Emerge from burrows for pond breeding in November, commonly during heavy rainfall. Females lay as many as 1,300 eggs, singly or in small groups. Eggs are usually attached to vegetation.	Females lay eggs underground in July or early August.	Breeding and larval development occur in cold permanent and semi permanent streams during the rainy season and in the spring. Females lay eggs during spring and likely guard nests through hatching.
Distribution	Scattered in the Coastal region from Sonoma Co. in the northern San Francisco Bay Area to Santa Barbara Co. up to 3,500 ft in elevation, and in the Central Valley and Sierra Nevada foothills from Yolo to Kern Co. up to 2,000 ft in elevation.	Endemic to CA and have a small range in the woodlands of the Santa Cruz Mts in western Santa Clara, northern Santa Cruz, and southernmost San Mateo Co. Occur from Sonoma Co. north along the coast into southwestern Oregon and east to Shasta Co.	Endemic to CA, occupying a small range from sea level to 3,000 ft in elevation along the coast in two isolated areas near San Francisco Bay. South of the Bay, they occur in the Santa Cruz Mts in San Mateo, Santa Clara, and Santa Cruz Co.

Sources: CDFW, 1997; Thomson et al., 2016; USEPA, 2010; USFWS, 2009, 2017

4 ENVIRONMENTAL CONSEQUENCES OF PROPOSED PROJECT MODIFICATIONS

This addendum is intended to provide CEQA compliance for proposed modifications and changed circumstances related to the project evaluated in the approved 2014 EIR. This addendum is organized by environmental issue area and is intended to consider all environmental topic areas that could be affected by modifications to the project description and/or any changes in circumstances, as compared to the approved 2014 EIR, and determine whether such modifications/changes would result in new significant impacts.

The purpose of this discussion below is to evaluate the environmental issue areas in terms of any "changed condition" (i.e., changed circumstances, project changes, or new information of substantial importance) that may result in a different environmental impact significance conclusion from the certified 2014 EIR. Each resource issue area is addressed below.

4.1 AESTHETICS

The 2014 EIR identified less than significant impacts associated with impacts on scenic vistas, changes in visual character, and damage to scenic resources within a state scenic highway corridor. The EIR identified no impacts associated with nighttime lighting.

Project modifications do not include nighttime work and would not create any new impacts associated with nighttime lighting. Control of insects using prallethrin (PT Wasp-Freeze II) would primarily take place in recreational areas. Treatment would allow greater access to scenic views because it would allow trails and recreational areas to remain safe and open to the public.

Basal bark application of herbicides to control vegetation would take place in natural lands and around agricultural areas and rangelands. The applications would be of same general type and scale (e.g., backpack, ATV, truck) as other IPM methods analyzed in the 2014 EIR and would be short-term in nature. Use of wick or frill/injection herbicide application techniques would occur in recreational areas, rangelands, and natural lands. These applications would be of similar scale and type as those analyzed in the 2014 EIR. These application techniques would not result in erosion or create changes that detract from scenic vistas or substantially alter the landscape. Use of herbicides to control vegetation would benefit visual resources by eliminating invasive vegetation that encroaches on recreational facilities and detracts from natural landscapes.

Based on the above discussion, the project modifications evaluated in this proposed Addendum are visually consistent with the project as proposed in the 2014 EIR. There would be no new significant effects compared to the environmental evaluation of aesthetic resources provided in the approved 2014 EIR as a result of implementation of the proposed project modifications.

4.2 AGRICULTURE AND FORESTRY RESOURCES

As discussed in Chapter 1 of the 2014 EIR (Draft EIR, p. 1-2), the pest management actions that would result from implementation of the IPMP on District lands would not result in conversion of important farmland to non-agricultural uses or cause changes that would result in the conversion of important farmland. Farmlands that are currently managed and leased by the District would continue similar operations with implementation of the project. Similarly, the IPMP would not and does not result in the loss of forest land or convert forestry land to non-forestry use. Similarly, the proposed project modifications would not convert agricultural or forestry uses and would therefore have no impact on these resources and would result in no change to conclusions of the 2014 EIR.

4.3 AIR QUALITY AND GREENHOUSE GAS EMISSIONS

The 2014 EIR found that IPM activities under the District's program would not result in any short-term construction-related emissions of criteria air pollutants or precursors of greenhouse gases because the program does not involve construction activities. Additionally, because of the nature of IPMP activities and the fact that similar IPM activities were and are continuing to be performed within District boundaries, the 2014 EIR found that there would be no increase in operational emissions that would result in violation of air quality plans or standards. The project similarly did not result in an increase in staff commuting to and from work sites. The 2014 EIR found that any air quality impacts would be less than significant.

The proposed modifications would increase the use of manual and mechanical IPM methods in fuel management areas from 136 acres to 140 acres, and would increase the use of manual and mechanical IPM methods in natural lands from 2 to 10 acres. In the fuel management areas, this would include the use of small power tools such as mowers and brushcutters as well as larger equipment such as tractors and masticators. In natural areas, activities would be conducted primarily using small power tools. If needed, larger tools such as masticators would be used for less than 1% of treatment areas. The increases in acreage for both natural lands and fuel management areas would result in the increased use of the small power tools, rather than larger equipment used for masticators, such as tractors, excavators or dozers. The 2014 EIR discussed the use of all of these types of equipment for use as part of the IPMP (see Draft EIR, pp 3-26, 3-27). The 2014 EIR found that the use of these types of equipment would not result in significant impacts on air quality. The proposed modifications represent only a minor increase in the overall use of small power tools in natural lands and fuel management areas, which would not be considered a new effect or a substantial increase in a previously identified effect.

The proposed modifications would not result in new or more severe impacts to air quality because the activities are fundamentally the same as those being performed under the existing program, and would not lead to an increase in the extent or intensity of emission-generating activities. The modifications in chemicals used for chemical control, and differences in application procedures do not result in any significant impacts to air quality.

4.4 BIOLOGICAL RESOURCES

The 2014 EIR identified potentially significant impacts to special status wildlife species as a result of the IPMP. Specifically, manual and mechanical treatment methods in buildings would affect special-status bats through inadvertent trapping, or removal of habitat if buildings are demolished, resulting in a potentially significant impact. Manual and mechanical treatments for recreational facilities, for fuel management areas, in rangelands and agricultural properties, and in natural lands would result in potentially significant impacts to central California coast coho salmon ESU, central California coast steelhead DPS, tidewater goby, California red-legged frog, foothill yellow-legged frog, California tiger salamander, San Francisco gartersnake, and northern western pond turtle through removal of egg masses and larva, conversion of aquatic habitat, or removal of food sources. The 2014 EIR also found that pesticide use for recreational facilities, for fuel management areas, in rangelands and agricultural properties, and in natural lands could result in the loss of host plants, and the direct mortality of larva and individuals of bay checkerspot butterfly, callippe silverspot butterfly, Smith's blue butterfly, and Zayante band-winged grasshopper and would result in a potentially significant impact. These impacts would be reduced to a less-than-significant level with implementation of Mitigation Measures 4.2.1a through 4.2.1d, and the proposed changes to the project would not alter these conclusions.

The 2014 EIR also found that alterations to the hydrology of ponds, including the conversion of ponds to ephemeral wetlands, would result in a change in wetland type and acreage would have a potentially significant impact on federally protected wetlands. Pesticide use in recreational facilities, fuel management areas, rangelands and agricultural properties, and natural lands occurring adjacent to or within wetlands

could results in the discharge of pollutants (sediment, herbicides) to wetlands and would also be a potentially significant impact. These impacts would be reduced to a less-than-significant level with implementation of Mitigation Measure 4.2.3, and the proposed changes to the project would not alter these conclusions.

The EIR found that there would be less than significant impacts to riparian habitat or sensitive natural communities, or to the movement of native residents or migratory fish or wildlife species. There would also be no conflict with local policies or ordinances protecting biological resources or with any habitat conservation plan. The proposed changes to the project would not alter these conclusions.

As described in Section 3 of this Addendum, the proposed modifications to the IPMP include three additional modes of pesticide application and three additional pesticides. The three additional modes of herbicide application, basal bark application, wick application, and frill/injection would not differ substantially from application methods examined in the 2014 EIR. In basal bark applications, an herbicide would be applied to the lower 12 to 15 inches of brush and tree trunks via low-pressure backpack sprayer. Wick application would consist of direct application herbicide using a rope wick. Frill/injection application would involve making a cut or hole in the target plant or tree using hand tools, and applying herbicide to the cut using an injection system, squirt bottle, or brush. The 2014 EIR examined potential effects to biological resources as a result of other IPM measures, including mowing and brush cutting with motorized equipment including mowers and chainsaws, green flaming with propane torches, herbicide spray applications using backpacks or ATVs with mounted tanks and hose sprayers. The 2014 EIR found that with implementation of the mitigation measures, there would be no significant impacts on biological resources. Because the IPM methods included in the proposed modifications are substantially similar to the methods in the approved project, there would be no new or substantially different impacts.

As described in Section 3, the District also proposes to modify the IPMP to expand the annual use of manual and mechanical treatment types in natural lands, including the use of pole pruner, chainsaws, chippers, and jawz implements, from 2 acres to 10 acres. If required, larger equipment, such as masticators, may be used in natural areas for up to 1% of the treatment area. The use of pole pruner, chainsaws, chippers, masticators, and jawz implements was analyzed in the 2014 EIR. The EIR found that with implementation of BMPs and mitigation measures, including pre-treatment surveys and buffers for sensitive species and nesting birds, there would be no significant impacts to biological species. In addition, while the proposed modifications represent an expansion of acreage that may be treated using manual and mechanical treatments, the EIR envisioned such expansion. The use of these manual and mechanical treatment types was approved in the EIR and the proposed modifications would not create any new or substantially different impacts.

The other proposed modifications and changed circumstances to the IPMP were evaluated in the Screening-Level Ecological Risk Assessment (SLERA) prepared by Ardea Consulting and Blankinship and Associates (see **Appendix 1**). The SLERA evaluated the potential risk for California giant salamanders and Santa Cruz black salamanders resulting from applications of pesticide active ingredients previously analyzed in the 2014 EIR. The SLERA also evaluated the potential risk to terrestrial and aquatic species following such applications of the three new active ingredients added to the District's IPMP.

The SLERA was conducted by performing a qualitative exposure assessment, which first evaluated the application sites of the 15 active ingredients that were analyzed in the 2014 EIR to assess the potential for overlap with the habitat requirements of California giant salamanders and Santa Cruz black salamanders. The SLERA then considered the application techniques for these same 15 active ingredients to determine the degree of exposure possible when there was a potential for overlap with the habitat of these salamander species. When exposure was deemed possible, the SLERA considered toxicity data for salamanders (or surrogate species) to reach a conclusion about whether the degree of exposure along with the severity of toxicity could result in a level of risk suggesting potentially significant impacts.

For each of the risk analyses, the SLERA concluded that the use and application of the 15 active ingredients examined posed either low risk or no risk to the two additional special status species. In some cases, the

chemicals examined were of very low or practically no toxicity to the salamanders, and therefore posed low to no risk to the subject species. In other cases, the SLERA found that the species was unlikely to have any contact with the application site. Therefore, there would be no new or more significant adverse impacts to California giant salamanders and Santa Cruz black salamanders.

A similar qualitative approach was used in the SLERA to consider the potential for adverse effects following applications of the three new pesticide active ingredients in the proposed IPMP modifications: triclopyr BEE, triclopyr TEA, and prallethrin. Since there were only three pesticide active ingredients to consider, the severity of the toxicity for different taxonomic groups was evaluated first to narrow down those species that could be harmed if they were exposed following an application. For those species with high sensitivity, the application sites and application techniques were considered to determine whether the degree of exposure could be sufficient to produce adverse effects following a pesticide application.

Triclopyr BEE, an herbicide used for vegetation management in natural lands and at the wildland urban interface, was found to be moderately toxic to aquatic-phase amphibians, moderately toxic to freshwater aquatic invertebrate species, and highly toxic to freshwater fish. However, the SLERA found that the District's BMPs are designed to greatly reduce, if not eliminate, movement to surface water. Because of this, actual impacts to aquatic invertebrates or birds and mammals that feed in aquatic habitats are anticipated to be minimal.

Triclopyr BEE was found to exhibit low toxicity to terrestrial animals and birds and practically nontoxic to bees. Although there is a greater chance of exposure to herbicides for special-status terrestrial animals, the low toxicity of the formulation led the SLERA to conclude that terrestrial special-status species are not at risk from its use.

The herbicide triclopyr TEA is intended for use in rangeland and agricultural properties as a spot spray treatment. It was found to be practically nontoxic to aquatic-phase amphibians, freshwater aquatic invertebrate species, freshwater fish, terrestrial-phase amphibians and reptiles, birds, mammals, and bees. Because of its low toxicity, the SLERA found that there was a low potential for adverse effects from its use.

As noted above, prallethrin is intended for use around buildings and in recreational facilities, primarily for control of stinging insects such as wasp or yellow jackets. Treatments in recreational facilities could include treatment of ground nests along hiking trails. Some insecticides exhibit high toxicity to ecological receptors, mostly aquatic species. However, their restricted uses to in and around buildings limits exposure such that it can be concluded that adverse impacts will not occur. Because of the targeted nature of prallethrin applications to stinging insect nests, only those stinging insect species would be directly exposed. Most insects, such as flying insects, would receive no exposure following an application to a wasp or hornet nest. Thus, most insects and insectivorous species are anticipated to be exposed to very limited amounts of prallethrin, leading to a conclusion that no special-status species are at risk.

The three new IPM application methods contained in the proposed modifications are substantially the same as those examined in the 2014 EIR. In addition, the SLERA found that there would not be any significant risks as a result of the project modifications, either from the introduction of three new pesticides to species already evaluated, or to the two new species of special concern. The District's BMPs ensure that all pesticides are used in a manner that is protective of biological resources.

Mitigation Measures 4.2.1a through 4.2.1d require additional protections for special status species including pre-treatment surveys and consultation with USFWS, NMFS, and CDFW, as appropriate. These mitigation measures were intended to apply to all species which were listed and/or of special concern at the time of the 2014 EIR; as a result, the list included in Mitigation Measure 4.2.1a in the 2014 EIR is out of date due to the two newly listed Species of Special Concern, the California giant salamander and Santa Cruz black salamander. The text of this mitigation measure has been clarified to reflect this; this clarification does not constitute a new mitigation measure.

With implementation of the District BMPs and Mitigation Measures 4.2.1a through 4.2.1d, no new or more significant impacts to biological resources would result from implementation of the proposed project modifications evaluated in this Addendum.

4.5 CULTURAL RESOURCES AND TRIBAL CULTURAL RESOURCES

The District maintains in-house records regarding the confidential locations of all known cultural resources within its boundaries. The District has compiled this information over time through direct information provided by qualified archaeologists as well as a variety of reports and record searches that have been performed for many projects throughout the District. Effects to cultural resources were previously considered to be Less Than Significant or Less Than Significant With Mitigation Incorporated.

As described in the 2014 EIR:

> *Chemical treatment options would be applied by spray application, wipe application, or cut-stump application. All methods of spraying under this project would be selective, that is, the operator (who is trained in identifying invasive plants) is in direct control of the sprayer, points the spray tip directly at the target weed or pest, and turns the spray equipment on and off to control the amount and direction of spray. Under the wipe-application treatment, herbicide is applied to the target plant using a sponge or rope wick applicator for selective treatment. With cut-stump application, herbicide is immediately applied to the circle of living cells after a woody plant has been cut close to the ground. These treatments would not involve earth-disturbing activities or affect any built-environment structures. Therefore, chemical treatment options would not adversely affect cultural resources and this topic is not discussed further in this EIR.*

As described above, the new application techniques in the proposed modifications are substantially the same as those examined in the 2014 EIR and do not include any ground disturbing activities. The basal bark application involves applying herbicide to brush and tree trunks using a backpack sprayer, similar to the cut-stump application procedure. Wick application would consist of direct application herbicide using a rope wick, which was contemplated in the EIR description cited above. Frill/injection application would involve making a cut or hole in the target plant or tree using hand tools, and applying herbicide to the cut using an injection system, squirt bottle, or brush and would not involve any earth disturbance or disturbance of structures. The increased area designated for manual and mechanical IPM treatments would be in natural areas and would involve activities addressed in the 2014 EIR. As described in the 2014 EIR, the District's BMPs require that District staff conducting treatment activities receive training on the protection of sensitive archaeological, paleontological, or historic resources, and halt work if any cultural resources are encountered. There would be no new or more severe impacts to cultural resources.

4.6 GEOLOGY AND SOILS

The 2014 EIR found that because the District's project would not include any ground disturbing work on steep hillsides, or the construction of new structures, or other grading activities that would be subject to seismic hazards, unstable geologic conditions, or expansive soils, there would be no impacts to geology and soils.

The proposed modifications would also not result in ground disturbing work on steep hillsides, construction of new structures, or other grading activities, and therefore would also not result in any impacts to geology and soils. While some of the pest management activities would result in the removal of targeted invasive species, potentially exposing soil to increased erosion hazards, the District as a standard practice would implement erosion control measures in BMP #28 (Table 4). BMP #28 would be implemented on sites with loose or unstable soils, steep slopes (greater than 30 percent), where a large percentage of the groundcover

will be removed, or near aquatic features that could be adversely affected by an influx of sediment. Erosion control measures could consist of application of forest duff or mulches, seeding, or planting of appropriate native plant species to control erosion. Therefore, with implementation of the previously identified BMPs when implementing the proposed modifications, no significant soil erosion impacts would occur.

4.7 HAZARDS AND HAZARDOUS MATERIALS

The 2014 EIR identified less-than-significant impacts related to human (i.e., mixer/loader/applicator, general public) exposure to existing hazardous materials use, storage, and disposal during manual, mechanical, and pesticide application control methodologies. Impacts associated with adverse effects on fish and wildlife are discussed in Section 4.4, "Biological Resources." Section 4.8, "Hydrology and Water Quality," describes potential adverse effects on waterways, runoff, storm drainage, and flood control.

The proposed project modifications would include use of three new pesticide active ingredients (i.e., triclopyr BEE, triclopyr TEA, prallethrin) and three new herbicide application methods (i.e., basal bark, wick, frill/injection) for pest control activities within proposed areas of disturbance that were analyzed in the 2014 EIR. Pesticide applications associated with IPM around buildings and in recreational facilities could result in transportation, use, and storage of prallethrin. Similarly, chemical treatments associated with IPM in vegetation management areas could result in transportation, use, and storage of triclopyr BEE. Vegetation management associated with IPM in rangelands and agricultural properties could result in transportation, use, and storage of triclopyr BEE and triclopyr TEA. For the reasons described in the 2014 EIR (Draft EIR, p. 4.5-11 – 4.5-12), issues not resulting in adverse impacts will not be addressed further in this Addendum.

Active ingredients associated with pesticides proposed for use under the IPMP have moderate to very low toxicity to humans. **Table 6** provides a summary of the human toxicity associated with triclopyr BEE, triclopyr TEA, and prallethrin.

Table 6. Summary of Proposed Pesticide Active Ingredient Human Toxicity

Active Ingredient	Mammalian Oral LD50 (mg/kg)[1]	Mammalian Dermal LD50 (mg/kg)[2]	Mammalian Inhalation LC50 (mg/L)[1]	USEPA Toxicity Category[3]
HERBICIDES				
Triclopyr BEE	803	>2,000	>4.8	Oral, Dermal (III) Inhalation (IV)
Triclopyr TEA	1,847	>2,000	>2.6	Oral, Dermal (III) Inhalation (IV)
INSECTICIDES				
Prallethrin	640_{male} 460_{female}	>5,000	0.29_{male} 0.33_{female}	Oral, Inhalation (II) Dermal (IV)

[1] Values are for rats.

[2] Values are for rabbits.

[3] Toxicity categories: High Toxicity (I), Moderate Toxicity (II), Low Toxicity (III), Very Low Toxicity (IV).

Sources: USEPA, 1998, 2002, 2016

Application of the proposed pesticides could result in varying degrees of exposure to both pesticide handlers (i.e., mixer/loader/applicators [MLAs]) and the general public within and downwind of District preserves. For example, MLAs can be exposed to pesticides via inhalation or by inadequate use of personal protective equipment (PPE). Because all District pesticide applicators must have or work under the direction of a person with a California Department of Pesticide Regulation (DPR) Qualified Applicator License (QAL) or

Qualified Applicator Certificate (QAC) per BMP #4 (Table 4), oral exposure is not expected due to the assumption that the MLA is properly trained not to consume pesticide.

As described in the 2014 EIR, the U.S. Environmental Protection Agency (USEPA) oversees pesticide use through the Worker Protection Standard (WPS), a regulation for agricultural pesticides for the purpose of reducing the risk of pesticide poisonings and injuries among agricultural workers and pesticide handlers (i.e., MLAs). The WPS contains requirements for pesticide safety training, notification of pesticide applications, use of personal protective equipment, restricted-entry intervals after pesticide application, decontamination supplies, and emergency medical assistance. Furthermore, the Occupational Safety & Health Administration (OSHA) provides general information on respirator use and OSHA standards that may apply with the use of other chemicals.

In addition to existing regulations that reduce potential effects of exposure of pesticides on MLAs, numerous BMPs (BMPs 1–10 and 34-36, Table 4) have been incorporated into the IPMP to minimize the potential for adverse impacts on both MLAs and the general public, including District workers who perform hand labor tasks in areas that have been treated with pesticides. In summary, the BMPs require that pesticides be applied under the guidance of QALs/QACs and according to the District's recommendations and label requirements; storage, loading, and mixing be conducted away from aquatic features, special status species or their habitat, and sensitive natural communities; application be restricted during times with high wind or when precipitation is likely or is occurring; drift avoidance measures be employed; application notification signs be posted prior to and following application for a specified period; cleanup of used containers be conducted according to guidelines that prevent contamination of any body of water within the treatment areas or adjacent watersheds; all appropriate laws and regulations pertaining to the use of pesticides and safety standards for employees and the public be followed, as governed by USEPA, DPR, and local jurisdictions; alternative treatment methods be considered for IPM projects currently utilizing glyphosate as a management tool; no-spray trail buffers are established; and annual pesticide literature reviews be conducted. These BMPs would also reduce the potential for increased risk of fire through the use of herbicides because this use reduces the buildup of flammable vegetation. Furthermore, removal of flammable vegetation through the use of herbicides would reduce fire fuel loads on District lands, thereby decreasing wildland fire hazards compared to existing conditions.

The general public within and near District preserves can be exposed to pesticides via inhalation, dermal contact with treated areas, or hand-to-mouth behavior following dermal contact with treated areas; however, these exposures are expected to be minimal or inconsequential due to the posting and notification requirements required by BMP #8 (Table 4), which indicates that signs providing information pertaining to planned pesticide applications shall be posted 24 hours prior to the start of treatment and remain in place for 72 hours after treatment is complete. Notification signs must contain the following information: product name, signal word, manufacturer, active ingredient, and USEPA registration number; target pest; preserve name; treatment location in preserve; date and time of application; date which notification sign may be removed; and contact person with telephone number. Furthermore, application requirements described in BMP #7 (Table 4) reduce risk of pesticide off-site movement by identifying weather and spray nozzle parameters which must be employed during herbicide applications. Once the applied pesticide has dried, transfer of pesticide residue is unlikely.

The culmination of the protective measures and regulatory requirements provides a foundation for assuring the most effective, yet relatively safe, use of pesticides when treatment is determined to be needed; therefore, the proposed modifications to the project would not result in new or more significant impacts compared to those disclosed in the 2014 EIR.

4.8 HYDROLOGY AND WATER QUALITY

The 2014 EIR identified potentially significant impacts related to potential manual control-related soil erosion and water quality impairment and chemical control-related water quality impacts. These impacts

would be reduced to a less-than-significant impact with implementation of Mitigation Measure 4.2-3 of the 2014 EIR (Draft EIR, p. 4.2-23). The 2014 EIR identified a less-than-significant impact associated with flooding of on- or off-site areas.

Proposed project modifications include use of three new pesticide active ingredients (i.e., triclopyr BEE, triclopyr TEA, prallethrin) and three new herbicide application methods (basal bark, wick, frill/injection) for pest control activities within proposed areas of disturbance that were analyzed in the 2014 EIR. None of the proposed pesticide uses would result in the alteration of drainage patterns or stream courses. While the proposed modifications expand the annual treatment area for removal of invasive species, no new mechanical vegetation management, earthmoving, or recontouring activity is proposed. If needed, placement of ground cover, or seeding of native perennial grasses and pasture grasses would occur after herbicide use or manual or mechanical treatment to stabilize exposed soils and to reduce the potential for increased runoff as a result of this project as required under BMP #28. With implementation of this BMP, and appropriate timing of herbicide use or manual or mechanical treatment not to coincide with the rainy season, no significant erosion or siltation impacts would occur. The project would not cause an increase in runoff that would result in flooding; however, because the District may use herbicides on rare occasions in wetlands (dry season) and along stream banks, the IPMP would have the potential to result in residual aquatic pesticide discharges to Waters of the United States. Note, however, that BMPs 19, 20, and 32 mandate that no IPM activities occur within 15 feet of aquatic resources. If IPM activities must be undertaken within 15 feet of aquatic resources, only pesticides and adjuvants approved for aquatic use can be used. For the reasons described in the 2014 EIR (Draft EIR, p. 4.4-9 – 4.4-10), issues not resulting in adverse impacts will not be addressed further in this Addendum.

Refer to **Table 7** for a summary of the environmental fate properties of the active ingredients proposed for inclusion in the IPMP.

Table 7. Summary of Pesticide Active Ingredient Environmental Fate Properties

Active Ingredient	Solubility (mg/L)[1]	Water Half-Life (days)	Soil Half-Life (days)	K_{OC}
HERBICIDES				
Triclopyr BEE	7.4_{salt} 440_{acid}	0.5_{salt}[2] 1.7_{acid}[3]	$<0.2_{salt}$[4] $8\text{-}18_{acid}$[5]	$640\text{-}1{,}650_{salt}$ $25\text{-}134_{acid}$
Triclopyr TEA	$4.12x10^5{}_{salt}$ 440_{acid}	$<0.01_{salt}$[6] 1.7_{acid}[3]	$5.6\text{-}13.7_{salt}$[7] $8\text{-}18_{acid}$[5]	$24\text{-}144_{salt}$ $25\text{-}134_{acid}$
INSECTICIDES				
Prallethrin	8.03	0.57[8]	3-29[9]	3,082

[1] At 25°C unless otherwise specified.

[2] Half-life via hydrolysis to triclopyr acid.

[3] Half-life via photolysis in river water to oxamic acid. Stable to hydrolysis.

[4] Half-life via hydrolysis to triclopyr acid.

[5] Half-life via aerobic biotic metabolism to 3,5,6-trichloro-2-pyridinol (TCP) and 3,5,6-trichloro-2-methoxypyridine (TMP).

[6] Half-life via dissociation to triclopyr acid.

[7] Half-life via aerobic biotic metabolism to triclopyr acid.

[8] Half-life via photolysis. Stable to hydrolysis.

[9] Half-life of 3-9 days via aerobic biotic metabolism; half-life of 29 days via photolysis.

Sources: SERA, 2011; USEPA, 1998, 2009, 2014

Triclopyr BEE is included on the California Department of Pesticide Regulation's (DPR's) Groundwater Protection List, indicating that it is recognized as a chemical with the potential to pollute groundwater (3 CCR § 6800(b), 2014). Chemicals are added to the Groundwater Protection List if they are both mobile (i.e., solubility >3 mg/L, K_{OC} <1,900) and persistent (i.e., hydrolysis half-life >14 days, aerobic soil metabolism half-life >610 days, anaerobic soil metabolism half-life >9 days), and applied in certain ways (i.e., applied to

soil via ground-based application equipment or chemigation, or applications are followed by flood or furrow irrigation; DPR, 2013). Because triclopyr BEE may be rapidly converted to triclopyr acid, the latter is typically the focus of research pertaining to environmental fate. Triclopyr acid is moderately persistent and very mobile, with persistence increasing with increasing anaerobic conditions. Its degradation product 3,5,6-trichloro-2-pyridinol (TCP) is also relatively mobile and persistent and has the potential to degrade groundwater in areas where soils are permeable, particularly where the water table is shallow. Such areas are identified as Groundwater Protection Areas by DPR. No Groundwater Protection Areas have been established in San Mateo, Santa Clara, or Santa Cruz Counties (DPR, 2018); therefore, use of products containing triclopyr BEE are not expected to impact groundwater quality when used according to label instructions within the District footprint. Furthermore, label language specifies that triclopyr BEE is not to be applied directly to water, to areas where surface water is present, or to intertidal areas below the mean high-water mark, and indicates that applicators must avoid contaminating surface water when cleaning equipment or disposing of equipment wash waters (Garlon 4 Ultra Label, 2008). The potential for impacts to surface water is further reduced by the requirements of BMP #19, which mandates the use of a 15-foot buffer around aquatic features during herbicide application, and Mitigation Measure 4.2-3 of the 2014 EIR, which states that the District shall obtain a National Pollutant Discharge Elimination System (NPDES) permit from the San Francisco Bay Regional Water Quality Control Board (RWQCB) and comply with design and operational BMPs required under the permit. The requirement for the District to obtain Statewide NPDES Permit for Residual Aquatic Pesticide Discharges to Waters of the US from Algae and Aquatic Weed Control Applications (General Permit # CAG 990005 and Water Quality Orders 2014-0078-DWQ and 2015-0029-DWQ) would only be applicable if the District intends to make intentional applications of pesticides directly to waters of the United States. If the District chooses to continue treatment actions within the designated buffer zone, it shall use pesticides and adjuvants labeled for aquatic use and follow the requirements of the mitigation measure for special-status wildlife species and the California Department of Fish and Wildlife (CDFW) Streambed Alteration Agreement. Further, consistent with BMP #20, the District complies with the California Red-Legged Frog Injunction that mandates that in known or potential California red-legged frog habitat, specified pesticides including triclopyr shall not be applied within 15 feet of aquatic features (including areas that are wet at time of spraying or areas that are dry at time of spraying but subsequently might be wet during the next winter season), utilize only spot-spraying techniques and equipment by a certified applicator or person working under the direct supervision of a certified applicator, and not be sprayed during precipitation or if precipitation is forecast to occur within 24 hours before or after the proposed application. Thus, use of products containing triclopyr BEE are not expected to result in unacceptable risk relating to the impairment of surface water quality.

Triclopyr TEA is also included on the Groundwater Protection List per 3 CCR § 6800(b) (2014). Like triclopyr BEE, triclopyr TEA may be rapidly converted to triclopyr acid and can further break down to TCP; however, because no Groundwater Protection Areas have been established in San Mateo, Santa Clara, or Santa Cruz Counties (DPR, 2018), use of products containing triclopyr TEA are not expected to impact groundwater quality when used according to label instructions within the District footprint. Although triclopyr TEA as found in Garlon 3A or other products containing triclopyr TEA as the sole active ingredient are registered for aquatic use and may be applied directly to water, triclopyr TEA in Capstone is formulated with aminopyralid TIPA and may not be applied directly to water, to areas where surface water is present, or to intertidal areas below the mean high-water mark. Further, individuals using Capstone must avoid contaminating surface water when cleaning equipment or disposing of equipment wash waters. Approved application sites for Capstone may include seasonably dry wetlands (including flood plains, marshes, swamps, or bogs) and areas around standing water on sites such as deltas and riparian areas (Capstone Label, 2015). This label language, in conjunction with the requirements of BMP #19, BMP #20, and Mitigation Measure 4.2-3 of the 2014 EIR described above, leads to a conclusion that the use of triclopyr TEA is not expected to result in unacceptable risk relating to the impairment of surface water quality.

Because of its very limited mobility in soil (i.e., high K_{OC}) and label language excluding application to soil, prallethrin is not on the Groundwater Protection List (3 CCR § 6800(b), 2014) or expected to impact groundwater quality when used according to label instructions within the District footprint. As with triclopyr BEE, label language specifies that prallethrin is not to be applied directly to water, to areas where surface

water is present, or to intertidal areas below the mean high-water mark and indicates that applicators must avoid contaminating surface water when cleaning equipment or disposing of equipment wash waters (PT Wasp-Freeze II Label, 2013). This label language, in conjunction with its relatively low solubility and the requirements of BMP #19 and Mitigation Measure 4.2-3 of the 2014 EIR described above, leads to a conclusion that the use of products containing prallethrin is not expected to result in unacceptable risk relating to the impairment of surface water quality.

In addition to the factors above, pesticide applications, when done, are implemented consistent with written recommendations prepared annually by a DPR-licensed Pest Control Adviser (PCA) and conducted in accordance with the BMPs presented in Table 4. The PCA recommendation addresses numerous topics including the criteria used to determine the need for pesticide use, potential hazards and restrictions, crop and site restrictions, proximity to people, pets and livestock and a statement indicating that alternatives and mitigation measures that would substantially lessen any significant adverse impact on the environment have been considered and if feasible, adopted. The BMPs also require that pesticide applications be conducted under the supervision of a person holding a QAL or QAC for pesticides; require all storage, loading, and mixing of herbicides be set back at least 300 feet from any aquatic feature and all mixing and transferring occur within a contained area; require that application cease when weather parameters do not meet label specifications, when wind at site of application exceeds seven miles per hour, or when precipitation occurs or is forecasted with greater than a 40 percent probability in the next 24-hour period.

For the reasons described above, the proposed modifications to the project would not result in any new or more severe impacts pertaining to hydrology and water quality.

4.9 LAND USE AND PLANNING

As described in Chapter 1 of the 2014 EIR (Draft EIR, p. 1-5), land use and planning impacts would occur if the IPMP would physically divide an established community (e.g., a freeway dividing a populated residential community), if it would conflict with a land use policy adopted for the purpose of avoiding an environmental impact, or if it would conflict with an applicable habitat conservation plan or natural community conservation plan. There are no approved habitat conservation plans or natural community conservation plans that apply to District lands. Implementation of the project would not involve any new development that would physically divide a community and actions covered under the proposed IPMP would not change the overall natural landscape of the site and no impact would occur. Therefore, no impacts would occur.

The District's purpose is to purchase, permanently protect, and restore lands forming a regional open space greenbelt, preserve unspoiled wilderness, wildlife habitat, watershed, viewshed, and fragile ecosystems, and provide opportunities for low-intensity recreation and environmental education. The primary objective of the IPMP is to control damage from pests through formal and consistent implementation of IPM principles to protect and restore the natural environment and provide for human safety and enjoyment while visiting and working on District lands. The proposed modifications to the IPMP would not meaningfully differ in this regard compared to the project as described in the 2014 EIR. Therefore, the proposed modifications to the project would not result in new significant impacts to land use and planning.

4.10 MINERAL RESOURCES

As discussed in Chapter 1 of the 2014 EIR (Draft EIR, p. 1-6), there are no known mineral resource recovery sites on District lands. Therefore, the proposed project modifications are not anticipated to alter the availability of any economic mineral resources. As discussed in the 2014 EIR, the project would have no impact on mineral resources and the project modifications do not alter this conclusion.

4.11 NOISE

Generally, District properties are located in rural parts of their respective counties and are not in close proximity to sensitive receptors. Noise-sensitive receptors on or adjacent to District preserves would include recreational visitors and occupied residences, although the latter are scattered in low-density development patterns, primarily along SR-35. The 2014 EIR found that any noise impacts resulting from the IPMP would be subject to BMP #29, which requires that any noise generating equipment, including vehicles and manual and mechanical equipment such as chainsaws, brushcutters, or masticators, would need to abide by local noise ordinances if the noise activities would be audible to any receptors. Any impacts would not be significant. Further, the use of noise generating equipment for fuel management throughout the year would not result in significant impacts as implementation of BMP #22 would prevent disturbance of nesting birds by requiring nesting bird surveys prior to treatment, establishment of nest buffers during nesting bird season, and nest monitoring by a District biologist during and after treatment activities if the activity has potential to adversely affect the nest.

The activities contemplated by the proposed modification do not introduce any additional sources or noise or increase the possibility of any impacts to sensitive receptors. Noise-generating equipment that may be used under the proposed herbicide application modifications (trucks, ATVs, pumps, etc.) would be similar or identical to those already used under the project, and would not generate increased noise in comparison to the existing project. As discussed above in Section 4.4, "Biological Resources," the expansion of acreage for manual and mechanical treatments was contemplated and approved in the 2014 EIR. For these reasons, and with implementation of BMP #22 and BMP #29, the proposed modifications would not result in new significant noise impacts.

4.12 POPULATION AND HOUSING

As discussed in Chapter 1 of the 2014 EIR (Draft EIR, p. 1-6 – 1-7), no elements of the project would alter population growth. No construction activities or addition of residences are part of the IPMP. The IPMP does not induce population growth because it does not involve any alteration of existing land uses or the introduction of new land uses associated with population increases (e.g., housing, employment centers). Moreover, the IPMP does not involve new infrastructure or services that would draw new residents to the area.

The proposed project modifications include three new pesticide application methods and three additional pesticide product formulations. Similar to the approved project, the proposed project modifications would not necessitate the construction of replacement housing and would result in no impact related to population and housing.

4.13 PUBLIC SERVICES AND UTILITIES

The 2014 EIR found that the IPMP would result in no significant impacts to public services. It concluded that actions under the IPMP would not result in an increase in District employees or the number of visitors at District preserves. Further, it determined that the project would not result in the construction of additional housing, commercial, or industrial development, nor would the project directly or indirectly increase the local population, and therefore, no new or altered governmental facilities would be needed to provide public services as a result of the project, nor would the project result in increased demand for public services.

The 2014 EIR also found there would be no impacts to utilities as a result of the IPMP. It determined that implementation of the IPMP would not be anticipated to result in any change in the level of solid waste generated at a District preserve and therefore would not affect permitted capacity of local or regional solid

waste disposal services serving the District lands. District facilities are not typically served by municipal storm drain facilities, so there would be no increased demand for storm water facilities.

The proposed modifications would similarly not result in any increases in District employees or visitors on District lands, nor would it result in the construction of housing, commercial, or industrial development. In addition, there would be no increased levels of solid waste or other utility services. The proposed modifications would not result in any new or more significant impacts to public services and utilities.

4.14 RECREATION

Recreation is one of the predominant land uses on District preserves, including a 220-mile network of hiking, bicycling, and equestrian trails on District lands. The IPMP is designed to include a long-term, science-based decision-making system that uses a specific methodology to manage damage from pests, and was developed in accordance with the District's mission to acquire and preserve a regional greenbelt of open space land in perpetuity, protect and restore the natural environment, and provide opportunities for ecologically sensitive public enjoyment and education. The IPMP is designed to enhance and preserve recreational opportunities and would therefore have no adverse impacts to recreation.

The proposed modifications are similarly designed to manage pests and invasive species, consistent with the District's goals of enhancing and preserving recreation. There would be no new or more significant impacts.

4.15 TRAFFIC AND TRANSPORTATION

As discussed in Chapter 1 of the 2014 EIR (Draft EIR, p.1-7 – 1-8), the IPMP would not have any significant effects on traffic and transportation. The IPMP describes pest management activities. The 2014 EIR found that these activities were consistent with existing levels of operation and maintenance activities and would not substantially increase throughout the duration of the plan (approximately one percent increase in pest management on an annual basis), and therefore would not result in any significant increases to traffic. The District determined that activities under the IPMP would not create changes in air traffic patterns, result in population increases that could adversely affect area traffic, or alter the level of emergency access. No oversized equipment would be used requiring special transport precautions on local streets, roads, or highways. No changes to access points or roadway design would occur with implementation of the IPMP. In addition, there are no policies or plans within the District preserves that pertain to public transit, bicycle, or pedestrian facilities.

The proposed modifications consist of three new pesticide formulations ,three additional methods of pesticide application, and some minor acreage changes for some treatment types. All of the vehicles that would be used as part of these modifications are already in use on District facilities and such use was approved in the 2014 EIR. In addition, these applications would be infrequent and intermittent and would not contribute substantially to any traffic, transportation, or emergency access. The proposed modifications would have no new or more significant impacts.

5 CONCLUSION

The proposed addition of three additional pesticide active ingredients, three additional methods of pesticide application, and treatment acreage and timing modifications to the District's IPMP would not alter any of the conclusions of the 2014 EIR. Additionally, the IPMP together with the proposed modifications thereto would have no significant impacts on the two additional Species of Special Concern. No new significant

environmental effects or a substantial increase in the severity of previously identified significant effects would result.

The additions also would not affect any of the mitigation measures, including their feasibility or implementation, although one mitigation measure has been clarified. As discussed above in Section 4.4, the 2014 EIR included mitigation measures to protect special status reptiles and amphibians, including pre-treatment surveys and consultation with USFWS, NMFS, and CDFW, as appropriate. While the 2014 EIR identified each of the special status amphibians and reptiles that were listed at the time of the EIR, this Addendum includes the two newly listed additional Species of Special Concern. These revisions are not a result of newly identified adverse impacts and do not substantially affect the current IPMP or other proposed program modifications.

As described above, this Addendum also provides a revised list of BMPs that clarify existing language, outline practices already being carried out by District staff, and further increase the protection and safety of humans and the environment. These revisions are not a result of newly identified adverse impacts and do not substantially affect the current IPMP or other proposed program modifications.

As mentioned above, none of the conditions listed in section 15162 of the CEQA Guidelines exist for the project modification described herein. Therefore, pursuant to section 15164 of the CEQA Guidelines, the differences between the approved project described in the 2014 EIR and the modification of the project as currently proposed and described in this Addendum are minor and this Addendum provides sufficient environmental documentation. No subsequent or supplemental MND or EIR is needed to address the project modifications or additional Species of Special Concern.

6 REFERENCES

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Midpeninsula Regional Open Space District

Screening-Level Ecological Risk Assessment

Integrated Pest Management Program (Updated)

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Ac.....Acre
a.i.....Active Ingredient
ATSDR .....Agency for Toxic Substances Disease Registry
BMP .....Best Management Practices
Bti.....*Bacillus thuringiensis* var. *israelensis*
bw.....Body Weight
CAS RN .....Chemical Abstract Service Registration Number
CDFW .....California Department of Fish and Wildlife
CSM .....Conceptual Site Model
EC_{50}.....Median Effective Concentration
ED_{50}.....Median Effective Dose
EIR .....Environmental Impact Report
FIFRA .....Federal Insecticide, Fungicide and Rodenticide Act
HHRA .....Human Health Risk Assessment
IPA .....Isopropylamine (salt)
IPC .....Integrated Pest Control
IPMP .....Integrated Pest Management Program
K.....Potassium (salt)
K_d .....Soil-Water Partition Coefficient
K_{oa} .....Octanol-Air Partition Coefficient
K_{oc} .....Organic Carbon Absorption Coefficient
K_{ow} .....Octanol-Water Partition Coefficient
LC_{50}.....Median Lethal Concentration
LD_{50}.....Median Lethal Dose
LO(A)EL/LOAEL.....Lowest Observable (Adverse) Effect Level
LOC.....Level of Concern
LOEC .....Lowest Observable Effect Concentration
MEA.....Monoethanolamine (salt)
MW .....Molecular Weight
NA.....Not Applicable
NDA.....No Data Available

NMFS.....National Marine Fisheries Service
NO(A)EL/ NOEL.....No Observable (Adverse) Effect Level
NOC .....Not Of Concern
NOEC.....No Observable Effect Concentration
PUR.....Pesticide Use Reporting
RED.....Reregistration Eligibility Decision
SLERA .....Screening Level Ecological Risk Assessment
SOD.....Sudden Oak Death
TEA.....Triethylamine (salt)
TGAI .....Technical grade of the active ingredient
TIPA.....Triisopropanolamine (salt)
Triclopyr BEE.....Triclopyr-2-butoxyethyl ester
USEPA.....U.S. Environmental Protection Agency
USFWS .....U.S. Fish and Wildlife Service

Executive Summary

This Screening Level Ecological Risk Assessment (SLERA) is conducted as an addition to the Ecological Risk Assessment conducted as part of the Environmental Impact Report (EIR) prepared for Midpeninsula Regional Open Space District (District) in 2014. Three new pesticide products that include three active ingredients that were not previously analyzed are proposed for addition to the District's Integrated Pest Management Program (IPMP). Additionally, two salamander species that reside in the District have been designated as special-status species since the 2014 EIR was completed.

Two of the new active ingredients, triclopyr-2-butoxy-ethyl ester (BEE) and triclopyr trimethylamine (TEA) salt, are herbicides that can be used to control a wide variety of weed species. Triclopyr BEE is proposed for use as a spot spray, cut-stump, or basal bark treatment. Triclopyr TEA is proposed for use as a spot spray, cut-stump, or frill/injection treatment. The third new active ingredient is prallethrin that is an insecticide used to control stinging insects and applied using an aerosol spray. The potential for exposure and adverse effects from these newly added active ingredients are considered for all special-status species including the recently designated special-status salamanders.

The salamander species recently designated as special-status species are the California giant salamander and Santa Cruz black salamander. California giant salamanders breed in permanent and semipermanent streams, and the larvae do not metamorphose for up to 18 months. Santa Cruz black salamanders do not have an aquatic larval stage. Eggs are laid in moist burrows, and the juveniles emerge from the egg appearing as fully formed small salamanders. The potential for exposure and adverse effects for these salamanders are considered for all previously assessed active ingredients and adjuvants as well as the newly added active ingredients.

The SLERA relied upon the three-stage process for risk assessments: problem formulation, analysis, and risk characterization. In the problem formulation phase, the District identified the appropriate scenarios to assess and the default data assumptions. The problem formulation stage concluded with conceptual site models (CSMs) that identified the complete exposure pathways carried forward in the analysis based on available information. During the analysis phase of the SLERA, exposure was qualitatively estimated with conservative assumptions. Also in the analysis phase, effect values were developed which incorporated the toxicity properties of the pesticides and adjuvants. The risk characterization phase provided conclusions on the potential for adverse effects to occur to ecological receptors. The risk characterization phase utilized a qualitative assessment.

Several qualitative considerations typically result in a conclusion that the potential for adverse effects would be low. This includes an assessment of the potential for species presence at an application site, incorporation of foraging range and diet, in addition to fate and transport processes of pesticides such as dilution and degradation.

The District's Best Management Practices (BMPs) and the Mitigation Measures from the 2014 EIR are designed to greatly reduce, if not eliminate, pesticide or adjuvant movement to surface water. Therefore, actual impacts to aquatic invertebrates or birds and mammals that feed in aquatic habitats are anticipated to be minimal. Those pesticides that are sufficiently toxic to

terrestrial-phase amphibians are used in such a manner that the potential for exposure is so low, no adverse effects are anticipated. For example, insecticides are either used in or around buildings or as targeted applications of stinging insects, such as wasps or hornets. Herbicides exhibit low toxicity to terrestrial animals. Although there is a greater chance of exposure for special-status terrestrial animals from herbicides, the low toxicity leads to a conclusion that terrestrial special-status species are not at risk.

This SLERA will be used to assist the District in assessing potential to affect particular species and developing site-specific measures to protect these species.

1 Introduction

This Screening Level Ecological Risk Assessment (SLERA) is an addition to the Assessment conducted as part of the previous Environmental Impact Report (EIR) (State Clearinghouse No. 2013092033) for the Integrated Pest Management Program (IPMP) (herein referred to as the 2014 EIR). Since the certification of the 2014 EIR, two species known to occur within the Midpeninsula Regional Open Space District (District) boundaries have been classified as Species of Special Concern by the California Department of Fish and Wildlife (Thomson *et al.,* 2016). These species are: California giant salamander (*Dicamptodon ensatus*) and Santa Cruz black salamander (*Aneides flavipunctatus niger*). Additionally, active ingredients in three new pesticide products are to be included in the IPMP:

Example Product Name	Pesticide Type	Pest(s) Controlled	Pesticide Active Ingredient(s)	Active Ingredient Abbreviation
Garlon 4 Ultra®	Herbicide	Broadleaf and Woody Plants	Triclopyr-2-butoxyethyl ester	Triclopyr BEE
Capstone®	Herbicide		Triclopyr triethylamine (TEA) salt and aminopyralid triisopropanolamine (TIPA) salt	Triclopyr TEA
PT® Wasp-Freeze® II	Insecticide	Wasps, Hornets	Prallethrin	Prallethrin

The active ingredient aminopyralid triisopropanolamine salt was previously analyzed in the 2014 EIR and is not analyzed in this SLERA. Keeping with the approach in the 2014 EIR, only active ingredients were assessed in this SLERA. No inert ingredients were considered.

1.1 Purpose of the Screening Level Ecological Risk Assessment

The SLERA assesses potential future activities to be conducted as part of the District's IPMP. Specifically, the SLERA focuses on potential risk for California giant salamanders and Santa Cruz black salamanders resulting from applications of pesticides previously analyzed in the 2014 EIR. The SLERA also evaluates the potential risk to terrestrial and aquatic species following applications of the three new pesticides added to the District's IPMP.

1.2 Approach

1.2.1 Assessment for California giant salamanders and Santa Cruz black salamanders

This SLERA was conducted by performing a qualitative exposure assessment. The application sites of the active ingredients in thirteen pesticides and three adjuvants that were analyzed in the 2014 EIR were evaluated to assess the potential for overlap with the habitat requirements of California giant salamanders and Santa Cruz black salamanders. One pesticide, PT® Wasp-Freeze®, is no longer used by District staff and is therefore not included in the current evaluation.

Additionally, the application techniques for these same pesticide products were considered to determine the degree of exposure possible when there was a potential for overlap with the habitat of these salamander species. When exposure was deemed possible, toxicity data for salamanders or surrogate species were considered to reach a conclusion regarding whether the degree of exposure along with the severity of toxicity could result in a level of risk suggesting adverse effects following pesticide applications.

1.2.2 Assessment for Triclopyr BEE, Triclopyr TEA, and Prallethrin

A similar qualitative approach was used for the consideration of the potential for adverse effects following applications of triclopyr BEE, triclopyr TEA, and prallethrin. Since there were only three pesticides to consider, the severity of the toxicity for different taxonomic groups was evaluated first to narrow down those species that could be harmed if they were exposed following an application. For those species with high sensitivity to the active ingredients in these pesticides, the application sites and application techniques were considered to determine whether the degree of exposure could be sufficient to produce adverse effect following an application.

2 Problem Formulation

Problem formulation is the first step in the SLERA process. Its purpose is to establish the goals, breadth, and focus of the assessment through a systematic process to identify the major factors to be considered in the assessment. District staff provided details on past pesticide use in the District. The IPMP was described initially in MROSD (2014a) and the environmental impacts assessed in MROSD (2014b). This SLERA assesses the modification to the IPMP for the potential for risk to the California giant salamander and Santa Cruz black salamander following applications of any pesticide included in the IPMP and any potential for risk to all special-status species in the District following applications of triclopyr BEE, triclopyr TEA, and prallethrin. Problem Formulation integrates available information (sources, contaminants, effects, and environmental setting) and serves to provide focus to the SLERA.

2.1 Application Scenarios

Details regarding the application of pesticides that impact the estimation of potential risk include:

- Type of pesticide
- Concentration of pesticide
- Application method (*e.g.*, bait station, spraying)
- Duration and frequency of applications
- Rate of application
- Area of application
- Setting in which activity would occur (*e.g.*, within a building, natural area)
- The use of adjuvants, if any.

The District's IPMP includes implementing cultural, biological, manual/mechanical, and chemical IPM practices in buildings, recreational facilities, fuel management areas, rangelands

and agricultural properties, and natural lands within District boundaries. The 2014 EIR includes Best Management Practices (BMPs) intended to minimize movement of pesticides to sensitive areas and protect special-status species. The 2014 EIR also includes Mitigation Measures for the protection of sensitive habitats and special-status species.

A modification to the IPMP is to include basal bark, wick, and frill/injection applications for herbicides, in addition to spot spray applications and cut-stump treatments. These application techniques are described in Section 3.1 of the Addendum Report. Depending on the treatment goals, a wick application could be be made to areas similar to a spot spray applications or uniformly across a larger area, but the potential for off-site movement is reduced. Basal bark and frill/injection applications are comparable to cut-stump applications with regards to area treated and potential for off-site movement. Other application techniques include aerosol spray of insecticides around buildings and along trails, placement of insecticidal disks in water troughs, bait and powdered insecticides used in and around buildings, bait boxes with rodenticides used inside buildings, and spraying herbicides in agricultural and natural settings. Adjuvants can be added to the application spray tank and mixed with the pesticide to improve the pesticide's efficacy by allowing it to more readily penetrate the plant's surface, reduce drift, enhance adhesion, etc. It is not uncommon for adjuvants to be included with a pesticide active ingredient in a pesticide product. In these cases, the adjuvant may be referred to as an inert ingredient. Refer to the IPM Guidance Manual (MROSD, 2014a) for complete details.

Appendix 1

Table Eco-1. List of pesticides and adjuvants included in the IPMP analyzed previously in the 2014 EIR.

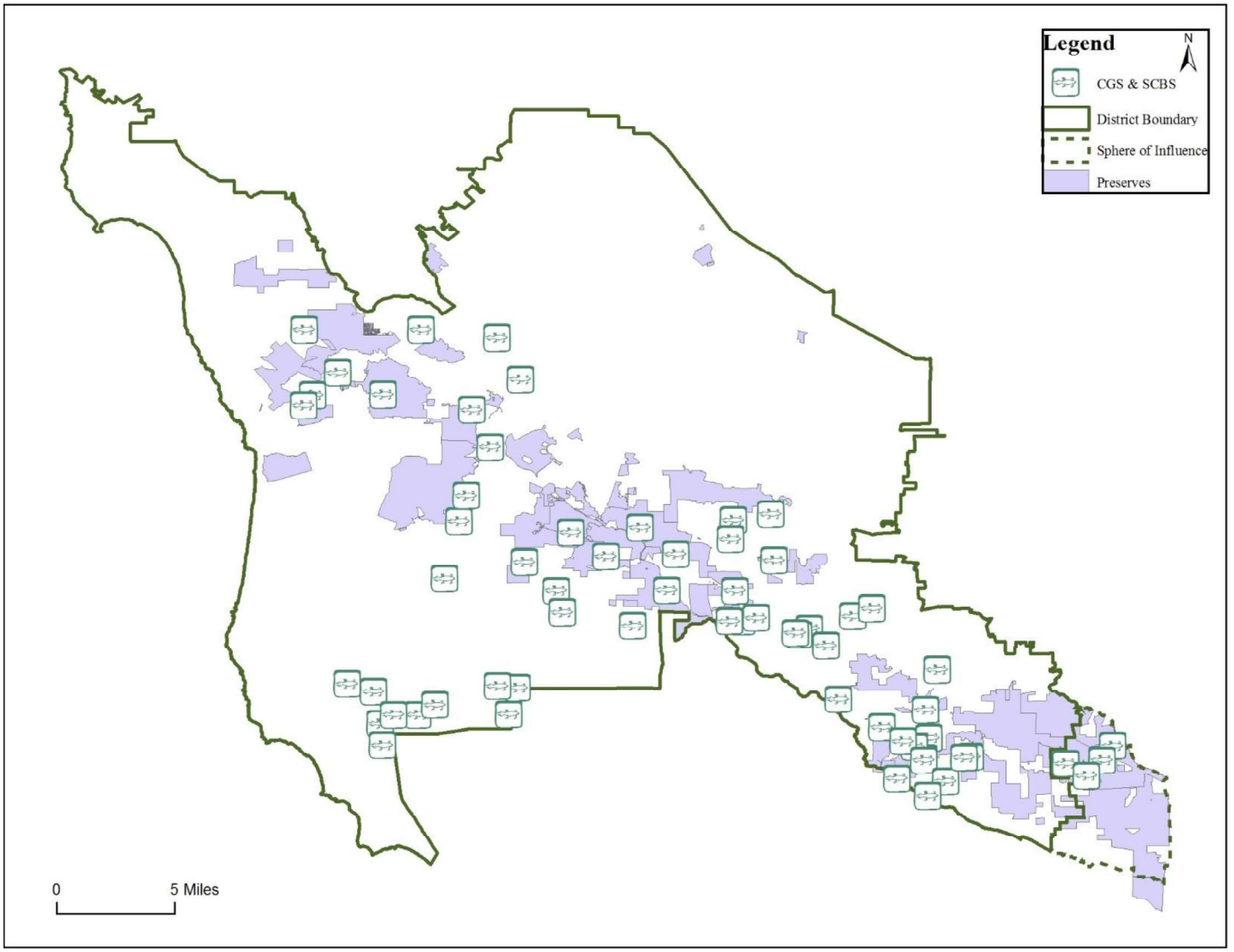
Pesticide Category	Active Ingredient	Product Formulations (Manufacturer)	Mode of Action	Purpose
Adjuvants/ Surfactants	Alcohol Ethoxylate	Liberate® (Loveland Products, Inc.)	Enhances uptake of herbicides and pesticides	Increase delivery and efficacy of pesticides to targets
	Alkylphenol Ethoxylate	Pentra-Bark® (Quest)	Enhances uptake of Agri-Fos	Increase delivery of Agri-Fos to trees
	Lecithin	Liberate® (Loveland Products, Inc.)	Enhances uptake of herbicides and pesticides	Increase delivery and efficacy of pesticides to targets
	Canola Oil, Ethyl and Methyl Esters	Competitor® (Wilbur-Ellis)	Decrease surface tension, increase herbicide uptake, enhance wetting and spreading	Increase delivery and efficacy of pesticides to targets
Fungicides	Phosphite K Salts, mono-/di-	Agri-Fos® (AgBio)	Fungal oxidative phosphorylation inhibitor	Prevents sudden oak death
Herbicides	Aminopyralid TIPA	Milestone® (Dow AgroSciences)	Auxin growth hormone mimic	Nonselective post-emergent broad-spectrum weed control
	Clethodim	Envoy Plus™ (Valent)	Fatty acid synthesis inhibitor	Selective post-emergent grass weed control
	Clopyralid MEA	Transline® (Dow AgroSciences)	Auxin growth hormone mimic	Selective broadleaf weed control
	Glyphosate IPA	Roundup Custom™ (Monsanto)	Amino acid synthesis inhibitor	Nonselective post-emergent broad-spectrum weed control
	Glyphosate K	Roundup ProMax® (Monsanto)	Amino acid synthesis inhibitor	Nonselective post-emergent broad-spectrum weed control
	Imazapyr IPA	Polaris® (Nufarm), Stalker® (BASF)	Amino acid synthesis inhibitor	Nonselective pre-and post-emergent broad-spectrum weed control
Insecticides	Diatomaceous Earth	Diatomaceous Earth	Water balance disruptor	Structural pest control (e.g., ants, cockroaches)
	D-trans Allethrin	PT® Wasp-Freeze® (BASF)	Voltage-gated sodium channel interference	Wasp and hornet control
	Fipronil	Maxforce® Bait Stations (Bayer)	GABA-gated chloride channel blocker	Ant control
	Indoxacarb	Advion® Gel Baits (DuPont)	Sodium channel blocker	Structural pest control (e.g., ants, cockroaches)
	Phenothrin	PT® Wasp-Freeze® (BASF)	Voltage-gated sodium channel interference	Wasp and hornet control
	S-Hydroprene	Gentrol Point Source® (Wellmark International)	Juvenile growth hormone mimic	Pest control (e.g., cockroaches, beetles, moths)
	Sodium Tetraborate Decahydrate	Prescription Treatment Baits (BASF), Terro® Ant Killer II (Terro)	Water balance disruptor	Ant control
Rodenticides	Cholecalciferol	Cholecalciferol baits	Calcification of soft tissues	Rodent pest control (e.g., rats, mice)

Table Eco-2. Environmental Fate and Transport of Active Ingredients Under Consideration for Use by the District.

Active Ingredient	Air	Water	Soil
Triclopyr butoxyethyl ester	> Relatively nonvolatile (vapor pressure = $3.6x10^{-6}$ mmHg)	> Relatively insoluble (solubility = 7.4 mg/L) > Rapid degradation via hydrolysis ($t_{1/2} \approx 0.5$ days) > Degradant is stable to hydrolysis	> Moderate sorption to soil; remains in upper 7.5 cm of soil (K_{OC} = 640 to 1650) > Primarily degraded by microbes under aerobic conditions ($t_{1/2} < 0.2$ days) > Degradants are likely more persistent and mobile in soil
Triclopyr triethylamine salt	> Nonvolatile (vapor pressure = $1x10^{-8}$ mmHg)	> Very soluble (solubility = 412,000 mg/L) > Dissipation within 1 minute > Degradant is stable to hydrolysis	> Mobile in soil (K_{OC} = 24 to 144) > Average aerobic $t_{1/2}$ = 9.7 days > Degradants are also persistent and mobile in soil
Prallethrin	> Slightly volatile (vapor pressure = $3.2x10^{-5}$ mmHg)	> Slightly soluble (8.03 mg/L) > Very rapid degradation via photolysis ($t_{1/2}$ = 0.57 days) > Rapid degradation in basic waters ($t_{1/2}$ = 4.9 days) > Slow degradation in neutral to acidic water	> High sorption and low mobility in soil (K_{OC} = 3,082) > Microbial degradation under aerobic conditions ($t_{1/2}$ = 3 to 9 days)

2.2 Active Ingredients and Adjuvants of Concern and Environmental Fate Properties

Table Eco-1 includes those active ingredients and adjuvants assessed in the 2014 EIR. The application scenarios analyzed in this SLERA were not substantially similar to any of the previously analyzed scenarios. Two insecticidal active ingredients analyzed in the 2014 EIR have been eliminated from the IPMP: d-trans allethrin and phenothrin, ingredients in PT Wasp-Freeze. PT Wasp-Freeze has been eliminated from the District's IPMP. The list of active ingredients in **Table Eco-1** will be considered for adverse effect to the California giant salamander and Santa Cruz black salamander. Environmental fate properties of the active ingredients assessed are presented in IPM Guidance Manual Appendix A (MROSD, 2014a). The potential for adverse effect for all special-status species will be assessed for the three new active ingredients: triclopyr BEE, triclopyr TEA, and prallethrin. Environmental fate properties of the three new active ingredients assessed here can be found in **Table Eco-2**.



Source: California Natural Diversity Database.

Figure Eco-1. Locations for California Giant Salamander and Santa Cruz Black Salamander Throughout the District.

2.3 Environmental and Ecological Settings

The setting has not dramatically changed from that assessed in the 2014 EIR. Refer to the 2014 EIR for a full description of the ecological setting for the District. The principal change to the setting is the inclusion of California giant salamander and Santa Cruz black salamander as species of special concern. **Figure Eco-1** displays where these two species have been known to occur within the District (CNDDB, 2017). Their widespread distribution indicates that there is a high likelihood that some pesticide applications could be conducted in or near their habitats.

In the 2014 EIR, the California tiger salamander (*Ambystoma californiense*) was assessed. Some important differences between the California tiger salamander and the two additional salamanders involve habitat and breeding biology. California tiger salamander breeds in seasonal pools and ponds which dry between rainy seasons. Therefore, the California tiger salamander larvae need to metamorphose before the pools dry up. California giant salamanders breed in permanent and semipermanent streams, and the larvae do not metamorphose for up to 18 months. Santa Cruz black salamanders do not have an aquatic larval stage. Eggs are laid in moist burrows, and the juveniles emerge from the egg appearing as fully formed small salamanders. Life history information for these three salamander species is found in **Table Eco-3**.

2.4 Assessment Endpoints and Measures of Ecological Effect

An endpoint is the outcome of an effect on an ecological component, for instance, increased mortality of fish due to a pesticide application. An assessment endpoint is the specific statement of the environmental effect that is going to be protected, such as the prevention of fish mortality due to a pesticide application. Measurement endpoints are measurable attributes used to evaluate the risk hypotheses and are predictive of effects on the assessment endpoints (USEPA, 1998). Since a specific individual of a species may have different mortality susceptibility compared to other individuals of the same species, it is common to use a statistical representation to define what is meant by the assessment endpoint. For instance, it is common to assess mortality by using the lethal dose at which 50 percent of the population in a study failed to survive (LD_{50}).

Assessment endpoints are the ultimate focus in risk characterization and link the measurement endpoints with the risk decision making process. The ecological effects that the SLERA intends to evaluate are determined by the assessment endpoint which is characterized by a specific measurement endpoint.

Table Eco-3. Life history characteristics of the California tiger salamander, California giant salamander, and the Santa Cruz black salamander.

Characteristics	California Tiger Salamander (*Ambystoma californiense*)	Santa Cruz Black Salamander (*Aneides flavipunctatus niger*)	California Giant Salamander (*Dicamptodon ensatus*)
Life Stages	Eggs hatch in ~10-14 d. Larvae require significantly more time to transform into juveniles than other amphibians. Around late spring, salamanders leave the ponds to find burrows. Adults reach sexual maturity in 4-5 yr. They are large and stocky with a broad, rounded snout. They are black in color with white or pale yellow spots.	Little is published on the ecological and life history of this species. Eggs undergo direct development, and fully formed juveniles appear at the surface shortly after the onset of fall rains, often in October or November. Juveniles have brassy dorsal coloration with white or light blue spots. Adults are either solid black or black with a few small white flecks.	The larval stage lasts ~18 mo. Larval dorsal coloration is light brown with a pale eye strip behind each eye. Larvae reach 10 cm within a year of hatching and metamorphose in late summer. Adults are tan to light reddish brown with coppery tan to dark brown irregular marbling. Marbling coloration is often brighter in young metamorphs than in adults.
Diet	Adults mostly eat insects. Larvae eat things such as algae, mosquito larvae, tadpoles and insects.	No diet information has been published. It is presumed that this species is a generalized predator of small arthropods and other invertebrates.	Adults feed on vertebrates such as other salamanders, lizards, mice, shrews, and voles, and invertebrates such as land snails, beetles, and crickets. Larvae are presumed to consume aquatic insects and other invertebrates.
Habitat	Restricted to vernal pools and seasonal ponds, including many constructed stock ponds, in grassland and oak savannah plant communities, predominantly from sea level to 2,000 ft. Prefer natural ephemeral pools or ponds that mimic them. Live underground, using burrows made by burrowing mammals.	Restricted to mesic forests in the fog belt of the outer Coast Range. Occur in moist streamside microhabitats and found in shallow standing water or seeps, under stones along stream edges and boards near creeks. Also occur in talus formations or rock rubble. Spend the majority of time underground.	Occur in mesic coastal forests (oak woodland and coniferous forest) and coastal chaparral habitats. Adults are occasionally found surface active or under cover objects in wet conditions.
Travel/Activity	Enter a dormant state called estivation during the dry months. They come out of their burrow around November. Nocturnal.	Most active on the surface at night, and more so during rain events.	Primarily nocturnal, but may also be active during daytime. Most active during rain events.
Breeding	Emerge from burrows for pond breeding in November, commonly during heavy rainfall. Females lay as many as 1,300 eggs, singly or in small groups. Eggs are usually attached to vegetation.	Females lay eggs underground in July or early August.	Breeding and larval development occur in cold permanent and semipermanent streams during the rainy season and in the spring. Females lay eggs during spring and likely guard nests through hatching.
Distribution	Scattered in the Coastal region from Sonoma Co. in the northern San Francisco Bay Area to Santa Barbara Co. up to 3,500 ft. in elevation, and in the Central Valley and Sierra Nevada foothills from Yolo to Kern Co. up to 2,000 ft. in elevation.	Endemic to CA and have a small range in the woodlands of the Santa Cruz Mountains in western Santa Clara, northern Santa Cruz, and southernmost San Mateo Co. Occur from Sonoma Co. north along the coast into southwestern Oregon and east to Shasta Co.	Endemic to CA, occupying a small range from sea level to 3,000 ft. in elevation along the coast in two isolated areas near San Francisco Bay. South of the Bay, they occur in the Santa Cruz Mountains in San Mateo, Santa Clara, and Santa Cruz Co.

Sources: Kucera, 1997; Thomson *et al*., 2016; USEPA, 2010; USFWS, 2017

2.4.1 Assessment Endpoints

Three principal criteria are used to select ecological characteristics that may be appropriate for assessment endpoints: (1) ecological relevance, (2) susceptibility to known or potential stressors, and (3) relevance to management goals. Of these, ecological relevance and susceptibility are essential for selecting assessment endpoints that are scientifically defensible (USEPA, 1998a). Although stressors can consist of many different environmental factors, the stressors addressed in this SLERA are those effects related to pesticide active ingredient and adjuvant exposure. This SLERA's endpoints focus on organism-level outcomes. These include adverse effects such as mortality, reproductive effects, and pathological changes (*e.g.*, kidney or liver tissue damage) (USEPA, 2003a).

The acute assessment endpoints selected in this SLERA for the IPMP include the prevention of mortality in special-status terrestrial and aquatic invertebrates (including pollinator insects), amphibians, fish, reptiles, birds, mammals, and plants.

The chronic assessment endpoints selected for the SLERA include the protection of survival and reproduction of the same species groups.

Typically, reproduction is a more sensitive endpoint than survival. Thus, this endpoint has been used over survival when it is available to result in a more conservative analysis. Adverse reproductive effects generally do not materialize until chronic exposures have occurred.

2.4.2 Measurement Endpoints

In terms of measurement endpoints, qualitative estimates of exposure have been used to evaluate levels at which exposure may occur whereas measures of effect (*e.g.*, LD_{50}) have been used to evaluate the response of the assessment endpoints if exposed to stressors. Concentration of a pesticide active ingredient or adjuvant in water is a measure of exposure for an aquatic species, and daily intake of a pesticide active ingredient or adjuvant in dietary items is a measure of exposure for terrestrial species. The concentration in water or the amount of daily ingestion of pesticide active ingredient or adjuvant that causes adverse effects are measures of effects. The likelihood of presence at the application site is addressed qualitatively in the risk characterization.

Specific measurement endpoints used to estimate adverse effects include no observable adverse effect levels (NOAELs), lowest observable adverse effects levels (LOAELs), and the median lethal (or effective) dose or concentration (*e.g.*, LD_{50}, ED_{50}, LC_{50}, or EC_{50}). For many amphibians and reptiles, toxicity data from other taxonomic groups were used for effects assessment. For the aquatic-phase for amphibians, fish, such as the rainbow trout, were often used to derive an appropriate TRV. For reptiles and terrestrial-phase amphibians, bird toxicity values act in place of specific toxicity values for reptile or terrestrial amphibian species (USEPA, 2004a).

2.5 Conceptual Site Models

Development of conceptual site models (CSMs) is a fundamental part of the risk assessment process, and their inclusion in the SLERA is intended to allow the reader to understand the exposure pathways which were evaluated for the application scenarios. The CSM is a written and visual representation of predicted relationships among stressors (*e.g.* a pesticide application), exposure pathways (*e.g.* eating vegetation containing pesticide), and assessment endpoints (*e.g.* mortality). It outlines the potential routes of exposure for each assessment endpoint and includes a description of the complete exposure pathways. An exposure pathway demonstrates how a pesticide active ingredient or adjuvant would be expected to travel from a source (application of pesticide active ingredient or adjuvant) to a plant or animal that can be affected by that pesticide active ingredient or adjuvant. An exposure pathway that is not complete means that it is unlikely for that organism to be exposed to the pesticide active ingredient or adjuvant by that exposure route. Application-specific CSMs are presented below (**Figures Eco-2** to **Eco-4**).

The ecological CSM covers the multiple pathways through which ecological receptors could be exposed to pesticide active ingredients and adjuvants that may be applied by the District. The starting point of each CSM is the application technique, which determines the characteristics of release of the pesticide active ingredient or adjuvant into the environment. Additionally, the site at which the application occurs can greatly determine what species could be present and whether exposure was likely.

2.6 Analysis Plan

This SLERA uses both reported values in the scientific literature and past pesticide use by the District to estimate the exposures outlined by the CSM. In addition, effects data for the measurement endpoints uses data available from the scientific literature. The analysis is qualitative in that each scenario and setting is considered to determine whether the amount of pesticide active ingredients and adjuvants applied will be sufficient to produce adverse effects.

The analysis plan with the CSMs has been implemented in the next phase of the ecological risk assessment process: analysis. The analysis phase is subdivided into two sections: exposure assessment and effects assessment.

3 Exposure Assessment

The exposure assessment is part of the analysis phase of the risk assessment process which follows the problem formulation phase described in Section 2. The exposure assessment provides a description of the nature and magnitude of the interaction between pesticide active ingredient or adjuvants in surface water, sediment, soil, or diet and the ecological receptors. The exposure to a pesticide active ingredient or adjuvant within an environmental compartment (*i.e.* within soil, water, plant tissue, or a specific organism) is based on estimates of quantities released, discharge patterns and inherent disposition of the substance (*i.e.* fate and distribution), as well as the nature of the specific receiving ecosystems. The results of the exposure assessment are combined with the effects assessment to derive the risk characterization results in the final phase of the risk assessment process.

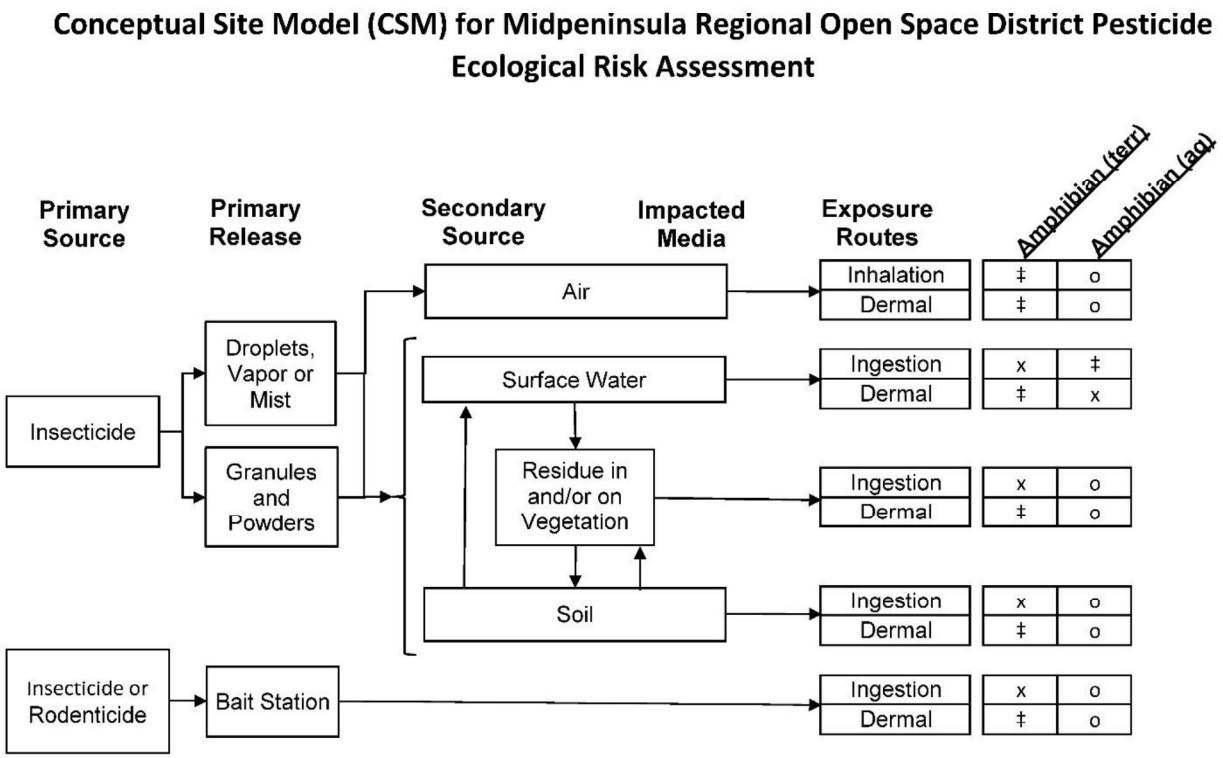


Figure Eco-2. Conceptual Site Model for California Giant Salamander and Santa Cruz Black Salamander Following Applications in and Around District Buildings

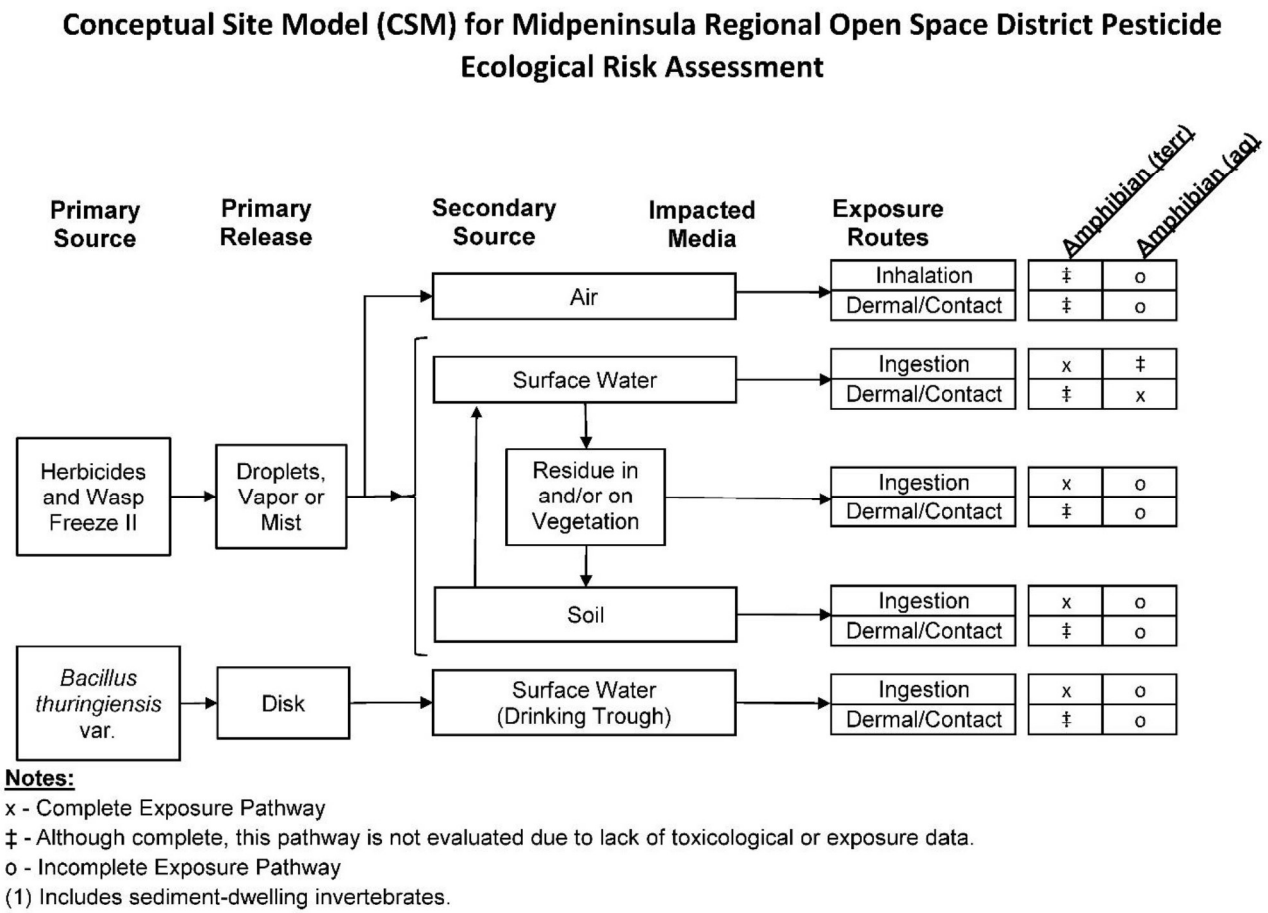
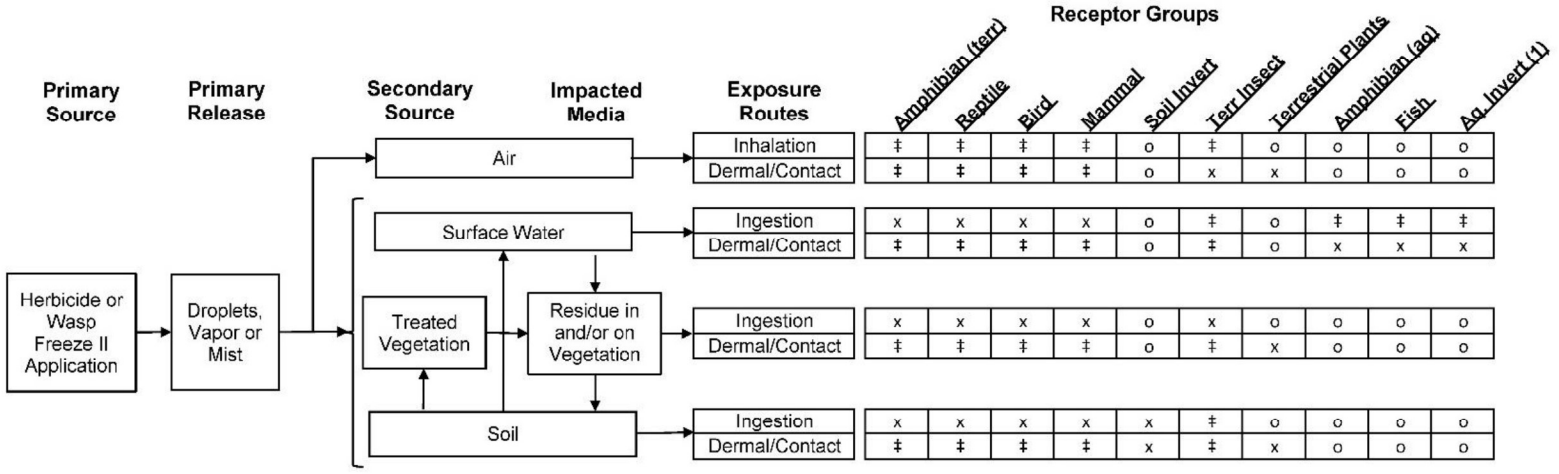


Figure Eco-3. Conceptual Site Model for California Giant Salamander and Santa Cruz Black Salamander Following Applications in Managed, Natural, and Recreational Areas

Conceptual Site Model (CSM) for Midpeninsula Regional Open Space District Pesticide Ecological Risk Assessment



Abbreviations
Soil Invert: Soil Invertebrate
Terr. Insect: Terrestrial Insect (incl. pollinators)
Aq. Invert: Aquatic Invertebrate

Notes:
x - Complete Exposure Pathway
‡ - Although complete, this pathway is not evaluated due to lack of toxicological or exposure data.
o - Incomplete Exposure Pathway
(1) Includes sediment-dwelling invertebrates.

Figure Eco-4. Conceptual Site Model for Insecticides Following Applications Outside District Buildings and Insecticides and Herbicides Following Applications in Managed, Natural, and Recreational Areas

The exposure assessments are broken down between acute (short term) and chronic (long term) exposures, described in detail below. Several assumptions are required to estimate the amount of pesticide active ingredient or adjuvants that an organism is exposed to as the pesticide active ingredient or adjuvant gets transported along the various exposure pathways. The assumptions for acute and chronic exposures, for each receptor group in general, in aquatic and terrestrial environments, and under each application scenario are included below.

Typical fate properties which tend to decrease the concentration of a pesticide active ingredient or adjuvant include aerobic degradation, anaerobic degradation, photolysis, hydrolysis, absorption, solubilization, and volatilization. Key transport properties that may not be accounted for are dilution and partial transfer between media such as plants, soil, water, and air.

3.1 Acute Exposure

Pesticide active ingredients and adjuvants typically degrade or dissipate following their release into the environment due to various fate and transport processes. Thus, peak residue levels typically occur immediately following an application and are used to provide an upper–bound and conservative estimate for an acute exposure. In a typical SLERA, an acute exposure is considered to be less than 14 days for fish mammals and birds. For other receptors, an acute exposure lasts for less than 3 days (USEPA, 1999).

Under a scenario in which a single application is sufficient for the control of the pest, the pesticide active ingredient and adjuvant residue shortly after the application is complete is used to estimate the acute exposure. If multiple applications are required, the highest concentration may occur following later applications due to the build-up of pesticide active ingredient and adjuvants from previous application(s) prior to their complete transport or breakdown. Dissipation in vegetation, soil, water, and other environmental media contributing to dietary intake all occur similarly, although at different rates.

3.1.1 Acute Exposure in Terrestrial Species

The peak instantaneous residue for each environmental media have been used for acute exposure estimates. Following a single application, the peak concentrations would occur immediately following the application. Following multiple applications, the peak concentration could occur following one of the later applications. Past use patterns and rates are used to qualitatively estimate the level of pesticide active ingredient and adjuvant residues following an application. For many application scenarios small amounts are used in isolated areas (*e.g.*, spraying yellow jacket ground nests). Under these scenarios, it is possible that there will be high concentrations within that isolated area. Other application scenarios provide for applications over a larger area (*e.g.*, wick, or spot spraying for weeds). When applications are made over a larger area, the potential for exposure increases as more individuals of a species could be present or move into the treated area.

3.1.2 Acute Exposure in Aquatic Species

No treatment of aquatic weeds is included in the District's IPMP so high concentrations of herbicide active ingredients and adjuvants in surface water would only be possible following an

accidental spill. Mosquito treatments in watering trough include placements of *Bacillus thuringiensis* var. *israelensis* (*Bti*) disk in the water. Fish and most aquatic invertebrates will have no access to such water troughs, so exposure for aquatic species to *Bti* for mosquito control will not occur.

3.2 Chronic Exposure

Chronic risk is based on the impacts resulting from long-term exposure to a pesticide active ingredient or adjuvant. Chronic exposure is typically over many months. However, for short-lived species such as some aquatic invertebrates, chronic exposure based on exposure across critical life-stages is considered to be on the order of a few weeks.

3.2.1 Chronic Exposure in Terrestrial Species

Chronic exposure for pesticide active ingredient and adjuvant is to continuously diminishing concentrations in environmental media. This is due to the fact that concentrations decrease over time. Some species with small home ranges for foraging areas might be exposed continuously if the treated area is greater than their home range. Other species with larger home ranges might only be exposed periodically as they move into and out of the treated area. If a pesticide active ingredient or adjuvant dissipates rapidly, species might not experience exposure for a sufficient duration to constitute a chronic exposure.

3.2.2 Chronic Exposure in Aquatic Species

Chronic exposures for aquatic species would result from pesticide active ingredient and adjuvant movement to water bodies from treated areas. Movement across soil surface or leaching through soil from a treated site to a surface water body is possible. Mitigation Measures 4.2-1a and 4.2-1b were discussed in the 2014 EIR to minimize movement of pesticide active ingredients and adjuvants to surface water bodies by including a 15-foot buffer distance between surface water and application sites. Best management practices (BMPs) included in the 2014 EIR also protect surface water bodies by minimizing movement to surface water bodies. These include BMPs 19 (Aquatic Areas), 20 (California red-legged frog [*Rana draytonii*]) and 32 (Surface and Groundwater Protection). These Mitigation Measures and BMPs all restrict pesticide applications within 15 feet of surface water bodies. Therefore, surface water concentrations are expected to be low or nonexistent such that chronic exposure following pesticide applications is unlikely.

4 Effects Assessment

The effects assessment consists of an evaluation of available toxicity or other adverse effects information that can be used to relate the exposures to pesticide active ingredients or adjuvants and adverse effects in ecological receptors. Toxicity is a property of a pesticide active ingredient or adjuvant, and its toxicity alone does not indicate its potential to harm a given organism. A key to understanding the effects on an organism is the dosage of the pesticide active ingredient or adjuvant that the organism receives or the concentration to which it is exposed. For example, certain substances are considered toxic (*e.g.*, caffeine), but are harmless in small dosages.

Conversely, an ordinarily harmless substance (*e.g.*, water) can be lethal if over-consumed. This relationship between exposure and effect on an organism is called a dose-response effect and is discussed in Section 5: Risk Characterization. Data that can be used to define the toxicity of a pesticide active ingredient or adjuvant include literature-derived or site-specific single-chemical toxicity data, site-specific ambient-media toxicity tests, and site-specific field surveys (Suter, 2007). For this SLERA, data were restricted to single pesticide active ingredient or adjuvant toxicity data from literature sources because specific toxicity data for the mixtures of pesticide active ingredient with adjuvants were not available. Available toxicity information for the active ingredients and adjuvants included in the District's IPMP are provided in **Table Eco-4**.

For certain pesticide active ingredients or adjuvants, no toxicity results are available for various taxonomic groups. For example, toxicity testing of reptiles is rare, and although becoming more common, many pesticides still lack toxicity test results for amphibians. USEPA (2004a) guidance is to use bird toxicity values in place of specific toxicity values for reptile species and terrestrial-phase amphibians when effects data were not available. USEPA commonly uses freshwater fish such as the rainbow trout as the surrogate species for the aquatic-phase of amphibians (USEPA, 2004a). The USEPA (2017) does not recommend applying any additional uncertainty or safety factors when using avian or fish toxicity endpoints for other taxonomic groups.

The USEPA has developed acute toxicity categories for pesticide active ingredients or adjuvants ranging from the most toxic category of 'very highly toxic' to the least toxic category of 'practically nontoxic' (**Table Eco-5**). These are strictly based on the results of laboratory acute toxicity tests and do not reflect the exposure or dose received by an organism that determines if there is an adverse effect following a pesticide application. This classification only gives a description of the numerical toxicity property of the pesticide active ingredient or adjuvant. It is not until it is combined with an estimate of exposure that adverse effects may occur. The detailed description of the toxicity classification from **Table Eco-5** for the various active ingredients and adjuvants is provided for each application scenario below.

4.1 Adjuvants Considered for Toxicity to California Giant Salamander and Santa Cruz Black Salamander

4.1.1 Alcohol Ethoxylate

Amphibian toxicity data were not available for alcohol ethoxylate (CAS RN 34398-01-1). For aquatic-phase amphibians an LC_{50} of 4.59 mg/L for African clawed frogs (*Xenopus laevis*) (Cardellini and Ometto, 2001) testing alcohol ethoxylate (CAS RN unstated) as a surrogate chemical. Therefore, alcohol ethoxylate would be considered moderately toxic to aquatic-phase amphibians. No bird toxicity data were available for alcohol ethoxylate to use for terrestrial-phase amphibians. Using the mammalian LD_{50} of 1,400 mg/kg (Gingell and Lu, 1991) as the next best toxicity value, alcohol ethoxylate would be considered slightly toxic to terrestrial-phase amphibians.

Table Eco-4. Acute Ecotoxicity Data for Terrestrial and Aquatic Organisms.

Active Ingredient[1]	Mammalian Oral LD_{50} (mg/kg)[2]	Avian LD_{50} (mg/kg)[3]	Honeybee LD_{50} (µg/bee)	Reptilian LD_{50} (mg/kg)[4]	Fish LC_50 (mg/L)[5]	Amphibian LC_{50} (mg/L)[6]	Aquatic Invert EC_{50} (mg/L)[7]
ADJUVANTS/SURFACTANTS							
Alcohol Ethoxylate	1,400*	NDA	NDA	NDA	0.59*	4.59*	0.2*
Alkylphenol Ethoxylate	600*ǂ	NDA	NDA	NDA	1.3*	NDA	14*
Canola Oil, Ethyl and Methyl Esters	>5,000*	NDA	NDA	NDA	95*	NDA	>100*
Lecithin	>5,000*	NDA	NDA	NDA	17.6*	NDA	9.3*
FUNGICIDES							
Phosphite K Salts, mono-/di-	>5,000	>1,060	>13.3	NDA	>544.6	NDA	>544.6
HERBICIDES							
Aminopyralid TIPA	>5,000*	>2,250*	$>100_{contact}$* $>117_{oral}$*	NDA	>100*	>95.2* (N. leopard frog)	>98.6*
Clethodim	1,360	>2,000	$>100_{contact}$	NDA	19	NDA	20.2
Clopyralid MEA	>5,000*	>1,465	$>100_{contact}$ $>100_{oral}$	NDA	103.5	NDA	225
Glyphosate IPA	>6,000 (mouse)	>3,851	$>100_{contact}$ $>100_{oral}$	NDA	11	7.6	5.3
Glyphosate K	>4,800*	>2,000*	$>100_{contact}$* $>100_{oral}$*	NDA	45*	2.9ǂ (wood frog)	134*
Imazapyr IPA	>5,000*	>2,150	$>100_{contact}$*	NDA	112	NDA	350
Triclopyr BEE	803	735	$>100_{contact}$	NDA	0.36	3.29 (leopard frog)	12
Triclopyr TEA	1,847	3,175	$>100_{contact}$*	NDA	240	159	775
INSECTICIDES							
Diatomaceous Earth	>5,000	NDA	NDA	NDA	NDA	NDA	NDA
D-trans Allethrin	900_{female}* $2{,}150_{male}$*	>2,000*	$3.4_{contact}$* 4.6_{oral}*	NDA	0.0094	NDA	0.0089*
Fipronil	97	11.3	$0.009_{contact}$ 0.19_{oral}	30ǂ	0.025	0.85	0.1
Indoxacarb	179	98	$0.18_{contact}$ 18.52_{oral}	NDA	0.65	NDA	0.064
Phenothrin	>5,000	>2,510	$0.067_{contact}$	NDA	0.017	NDA	0.0044
Prallethrin	460	>1,000	$0.028_{contact}$	NDA	0.012	NDA	0.0062
S-Hydroprene	>5,050	NDA	NDA	NDA	>100*	NDA	0.0029*
Sodium Tetraborate Decahydrate	4,550	>2,150*	$>362.58_{contact}$*	NDA	27	420*	133*
RODENTICIDES							
Cholecalciferol	25.24	>600	NDA	NDA	NDA	NDA	NDA

Table Eco-4. Continued.

[1] Surrogate chemicals were used when no ecotoxicity data were available for target chemicals. When no ecotoxicity data were available for both target and surrogate chemicals, values are described as No Data Available (NDA). For each active ingredient, the following surrogate chemicals were used to obtain ecotoxicity values (*):
Alcohol Ethoxylate: Alcohols, C9-11, ethoxylated (mammalian); Alcohols, C14-15, ethoxylated (fish, aquatic invert); Alcohol ethoxylate, unspecified (amphibian)
Alkylphenol Ethoxylate (proprietary blend): Alkylphenol Ethoxylate (mammalian, fish, aquatic invert)
Canola Oil, Ethyl and Methyl Esters (proprietary blend): Competitor Formulation (mammalian, fish, aquatic invert)
Lecithin: Liberate Formulation (mammalian, fish, aquatic invert)
Aminopyralid TIPA: Aminopyralid (mammalian, avian, honeybee, fish, amphibian, aquatic invert)
Clopyralid MEA: Clopyralid (mammalian)
Glyphosate K: Glyphosate (mammalian, avian, honeybee, fish, aquatic invert)
Imazapyr IPA: Imazapyr (mammalian, honeybee)
Triclopyr TEA: Triclopyr (honeybee)
D-trans Allethrin: D-allethrin (mammalian); Allethrin (avian, honeybee, aquatic invert)
S-Hydroprene: Hydroprene (fish, aquatic invert)
Sodium Tetraborate Decahydrate: Boric acid (avian, honeybee, amphibian, aquatic invert)

[2] Values are for rats unless otherwise specified.
[3] Values are for mallard duck or bobwhite quail.
[4] Values are for fringe-toed lizard.
[5] Values are for rainbow trout or bluegill sunfish.
[6] Values are for African clawed frog or Australian tree frog unless otherwise specified.
[7] Values are for *Daphnia magna* or similar species.
* Value is derived from a surrogate chemical. See Footnote 1.
[†] A No Observable Effect Level (NOEL) or No Observable Effect Concentration (NOEC) was used when no LD_{50} or LC_{50} data, respectively, were available.

Sources: [Alcohol Ethoxylate: Gingell and Lu, 1991; Kline *et al*., 1996; Cardellini and Ometto, 2001; Morrall *et al*., 2003], [Alkylphenol Ethoxylate: Hardin *et al*., 1987; Macek and Krzeminski, 1975; Dorn *et al*., 1993], [Canola Oil, Ethyl and Methyl Esters: Wilbur-Ellis, 2010; WSDA, 2009], [Lecithin:Loveland Products, 2016; WSDA, 2009], [Phosphite K Salts, mono-/di-: Health Canada PMRA, 2012], [Aminopyralid TIPA: USEPA, 2001a, 2001b, 2003b, 2003c, 2004, 2005a], [Clethodim: USEPA, 1986a, 1986b, 1986c, 1990a, 2014a], [Clopyralid MEA: SERA, 2004; USEPA, 1974a, 1974b, 1978b, 1980a, 1980b], [Glyphosate IPA: McComb *et al*., 2008; USEPA, 1972a, 1972b, 1978b, 1980c, 1980d, 1995a], [Glyphosate K: USEPA, 1995b, 1995c, 1997a, 2015; Navarro-Martin *et al*., 2014], [Imazapyr IPA: USEPA, 1983, 1984a, 1984b, 1984c, 2005b], [Triclopyr BEE: USEPA, 1980e, 1985a, 1991, 1993a, 1998b; Wojtaszek *et al*., 2005], [Triclopyr TEA: USEPA, 1973a, 1978c, 1978d, 1992a, 1998b; Perkins *et al*., 2000], [Diatomaceous Earth: USEPA, 1984d], [D-trans allethrin: WHO, 2002; USEPA, 1984e, 1992b, 1993b; Stevenson, 1986], [Fipronil: USEPA, 1990b, 1990c, 1992c, 2007; Zaluski *et al*., 2015; Peveling and Demba, 2003; Overmyer *et al*., 2007], [Indoxacarb: DPR, 2006; USEPA, 1979, 1994a, 1995d, 1997b, 2003d], [Phenothrin: USEPA, 1975, 1978e, 1989, 1994b, 2008], [Prallethrin: USEPA, 1989b, 1989c, 1989d, 1989e, 2014b], [S-Hydroprene: HSDB, 2016; USEPA, 1973c; Oda *et al*., 2005], [Sodium Tetraborate Decahydrate: USEPA, 1982, 1984f, 1987, 2006; Birge and Black, 1977; Bantle *et al*., 1999], [Cholecalciferol: Lam, 1992; USEPA, 2004d]

Table Eco-5. Acute Ecotoxicity Categories for Terrestrial and Aquatic Organisms.

Toxicity Category	Avian: Acute Oral LD_{50} (mg/kg)	Avian: Dietary Concentration (mg/kg-diet)	Aquatic Organisms: Acute LC_{50} (mg/L)	Wild Mammals: Acute Oral LD_{50} (mg/kg)	Non-Target Insects: Acute LD_{50} (µg/bee)
very highly toxic	<10	<50	<0.1	<10	
highly toxic	10-50	50 – 500	0.1 - 1	10 - 50	<2
moderately toxic	51-500	501 – 1000	>1 - 10	51 - 500	2 - 11
slightly toxic	501-2000	1001 – 5000	>10 - 100	501 - 2000	
practically nontoxic	>2000	>5000	>100	>2000	>11

Source: USEPA 2017

4.1.2 Alkylphenol Ethoxylate

Amphibian toxicity data were not available for alkylphenol ethoxylate. For aquatic-phase amphibians an LC_{50} of 1.5 mg/L for bluegill sunfish (*Lepomis macrochirus*) (Macek and

Krzeminski, 1975 *in* ECOTOX, 2018) would indicate alkylphenol ethoxylate is moderately toxic to aquatic-phase amphibians. No bird toxicity data were available for alkylphenol ethoxylate to use for terrestrial-phase amphibians. Using the mammalian NOEL of 600 mg/kg in a formulated product (Hardin *et al*., 1987 *in* ECOTOX, 2018) as the next best toxicity value, alkylphenol ethoxylate would be considered at most slightly toxic to terrestrial-phase amphibians.

4.1.3 Canola Oil, Ethyl and Methyl Esters

Amphibian toxicity data were not available for canola oil. For aquatic-phase amphibians an LC_{50} of 95 mg/L for rainbow trout (WSDA, 2009) testing modified vegetable (seed) oil, polyethylene glycol fatty acid ester, polyoxyethylene sorbitan fatty acid ester as surrogate chemicals would indicate canola oil is slightly toxic to aquatic-phase amphibians. No bird toxicity data were available for canola oil to use for terrestrial-phase amphibians. Using the mammalian LD_{50} of >5,000 mg/kg (Wilbur-Ellis, 2010) testing modified vegetable oil as a surrogate as the next best toxicity value, canola oil would be considered practically nontoxic to terrestrial-phase amphibians.

4.1.4 Lecithin

Amphibian toxicity data were not available for lecithin. For aquatic-phase amphibians an LC_{50} of 17.6 mg/L for rainbow trout (WSDA, 2009) testing a mixture of lecithin, methyl esters of fatty acids, and alcohol ethoxylates as surrogate chemicals would indicate lecithin is slightly toxic to aquatic-phase amphibians. No bird toxicity data were available for lecithin to use for terrestrial-phase amphibians. Using the mammalian LD_{50} of >5,000 mg/kg (Loveland Products, 2016) testing a mixture of lecithin, methyl esters of fatty acids, and alcohol ethoxylates as surrogates as the next best toxicity value, canola oil would be considered practically nontoxic to terrestrial-phase amphibians.

4.2 Pesticide Active Ingredients Considered for Toxicity to California Giant Salamander and Santa Cruz Black Salamander

4.2.1 Phosphite, mono-/di-potassium salts

Amphibian toxicity data were not available for the monopotassium and dipotassium phosphite salts. For aquatic-phase amphibians an LC_{50} of >544.6 mg/L for rainbow trout (PMRA, 2012) would indicate the monopotassium and dipotassium phosphite salts are practically nontoxic to aquatic-phase amphibians. Using the avian LD_{50} of >1,060 mg/kg for mallard ducks (*Anas platyrhynchos*) (PMRA, 2012), the monopotassium and dipotassium phosphite salts would be considered, at most, slightly toxic to terrestrial-phase amphibians.

4.2.2 Aminopyralid Triisopropanolamine (TIPA) Salt

For aquatic-phase amphibians, an LC_{50} of >95.2 mg/L for northern leopard frog (*Lithobates pipiens*) (USEPA, 2003b *in* OPP Ecotox) testing aminopyralid as a surrogate would indicate aminopyralid TIPA is, at most, slightly toxic to aquatic-phase amphibians. Using the avian LD_{50} of >2,250 mg/kg for northern bobwhite (*Colinus virginianus*) (USEPA, 2001a *in* OPP Ecotox),

testing aminopyralid as a surrogate would indicate aminopyralid TIPA is practically nontoxic to terrestrial-phase amphibians.

4.2.3 Clethodim

Amphibian toxicity data were not available for clethodim. For aquatic-phase amphibians, an LC_{50} of 18 mg/L for rainbow trout (USEPA, 1986a *in* OPP Ecotox) would indicate clethodim is slightly toxic to aquatic-phase amphibians. Using the avian LD_{50} of >2,000 mg/kg for northern bobwhite (USEPA, 1986b *in* OPP Ecotox) would indicate clethodim is practically nontoxic to terrestrial-phase amphibians.

4.2.4 Clopyralid Monoethanolamine (MEA) Salt

Amphibian toxicity data were not available for clopyralid MEA. For aquatic-phase amphibians, an LC_{50} of 103.5 mg/L for rainbow trout (USEPA, 1978a *in* OPP Ecotox) would indicate clopyralid MEA is practically nontoxic to aquatic-phase amphibians. Using the avian LD_{50} of 1,465 mg/kg for mallard duck (USEPA, 1980a *in* OPP Ecotox) would indicate clopyralid MEA is slightly toxic to terrestrial-phase amphibians.

4.2.5 Glyphosate Isopropylamine (IPA) Salt

For aquatic-phase amphibians, an LC_{50} of 110.8 mg/L for Australian tree frog (*Litoria moorei*) (USEPA, 1995a *in* OPP Ecotox) would indicate glyphosate IPA is practically nontoxic to aquatic-phase amphibians. Using the avian LD_{50} of >3,851 mg/kg for northern bobwhite (USEPA, 1978b *in* OPP Ecotox) would indicate glyphosate IPA is practically nontoxic to terrestrial-phase amphibians.

4.2.6 Glyphosate Potassium (K) Salt

For aquatic-phase amphibians, an NOEC of 2.9 mg/L for wood frog (*Lithobates sylvaticus*) (Navarro-Martin *et al*., 2014 *in* ECOTOX, 2018) would indicate glyphosate K is, at most, moderately toxic to aquatic-phase amphibians. Using the avian LD_{50} of >2,000 mg/kg for northern bobwhite (USEPA, 1997a *in* OPP Ecotox) using glyphosate as a surrogate would indicate glyphosate K is practically nontoxic to terrestrial-phase amphibians.

4.2.7 Imazapyr Isopropylamine (IPA) Salt

Amphibian toxicity data were not available for imazapyr IPA. For aquatic-phase amphibians, an LC_{50} of 112 mg/L for rainbow trout (USEPA, 1984a *in* OPP Ecotox) would indicate imazapyr IPA (as the Arsenal formulation) is practically nontoxic to aquatic-phase amphibians. Using the avian LD_{50} of >2,150 mg/kg for mallard duck (USEPA, 1984b *in* OPP Ecotox) would indicate imazapyr IPA (as the Arsenal formulation) is practically nontoxic to terrestrial-phase amphibians.

4.2.8 Diatomaceous Earth

Almost no toxicity data were available for diatomaceous earth. No aquatic toxicity data were available for any species. Therefore, no estimate is available for aquatic-phase amphibians. However, the physical nature of diatomaceous earth suggests it is likely practically nontoxic to aquatic-phase amphibians. Using the mammalian LD_{50} of >5,000 mg/kg (USEPA, 1984d) would indicate diatomaceous earth is practically nontoxic to terrestrial-phase amphibians.

4.2.9 Fipronil

For aquatic-phase amphibians, an LC_{50} of 0.85 mg/L for African clawed frog (Overmyer *et al*., 2007 *in* ECOTOX, 2018) would indicate fipronil is highly toxic to aquatic-phase amphibians. Using the avian LD_{50} of 11.3 mg/kg for northern bobwhite (USEPA, 1990b *in* OPP Ecotox) would indicate fipronil is highly toxic to terrestrial-phase amphibians.

4.2.10 Indoxacarb

Amphibian toxicity data were not available for indoxacarb. For aquatic-phase amphibians, an LC_{50} of 0.65 mg/L for rainbow trout (USEPA, 1997b *in* OPP Ecotox) would indicate indoxacarb, testing Indoxacarb (DPX-MP062-51A), is highly toxic to aquatic-phase amphibians. Using the avian LD_{50} of 98 mg/kg for northern bobwhite (USEPA, 1997c *in* OPP Ecotox) would indicate indoxacarb is moderately toxic to terrestrial-phase amphibians.

4.2.11 S-Hydroprene

Amphibian toxicity data were not available for S-hydroprene. For aquatic-phase amphibians, an LC_{50} of >100 mg/L for bluegill sunfish (USEPA, 1973b *in* OPP Ecotox) using hydroprene (Zoecon ZR-512 formulation) as a surrogate would indicate S-hydroprene is practically nontoxic to aquatic-phase amphibians. Using the mammalian LD_{50} of >5,050 mg/kg (HSDB, 2016) would suggest S-hydroprene is practically nontoxic to terrestrial-phase amphibians.

4.2.12 Sodium Tetraborate Decahydrate

For aquatic-phase amphibians, an LC_{50} of 420 mg/L for African clawed frog (Bantle *et al*., 1999 *in* ECOTOX, 2018) using boric acid as a surrogate would indicate sodium tetraborate decahydrate is practically nontoxic to aquatic-phase amphibians. Using the avian LD_{50} of >2,510 mg/kg for northern bobwhite (USEPA, 1982 *in* OPP Ecotox) would indicate sodium tetraborate decahydrate is practically nontoxic to terrestrial-phase amphibians.

4.2.13 Cholecalciferol

No relevant aquatic toxicity data are available for any species. Therefore, no estimate is available for aquatic-phase amphibians. Using the avian LD_{50} of >600 mg/kg for mallard duck (USEPA, 2004d) would indicate cholecalciferol is, at most, slightly toxic to terrestrial-phase amphibians.

4.3 New Pesticide Active Ingredients Considered for Toxicity to All Special-Status Species

4.3.1 Triclopyr BEE

Triclopyr BEE is moderately toxic to aquatic-phase amphibians based the LC_{50} of 3.29 mg/L for northern leopard frogs (Wojtaszek *et al*., 2005 *in* ECOTOX, 2018). Triclopyr BEE is moderately toxic to freshwater aquatic invertebrate species based on the LC_{50} of 1.7 mg/L in water flea (*Daphnia magna*) (USEPA, 1980e *in* OPP Ecotox). Triclopyr BEE is highly toxic to freshwater fish based on the LC_{50} of 0.36 mg/L in bluegill sunfish (USEPA, 1993a *in* OPP Ecotox).

No toxicity information was available for terrestrial-phase amphibians or reptiles. The toxicity of triclopyr BEE to terrestrial-phase amphibians and reptiles was considered similar to that in birds (USEPA, 2017). Triclopyr BEE is slightly toxic to birds based on an LD_{50} of 735 mg/kg (USEPA, 1991 *in* OPP Ecotox) in northern bobwhite and slightly toxic to mammals based on an LD_{50} of 803 mg/kg (USEPA, 1998). Triclopyr BEE is practically nontoxic to bees based on a contact LD_{50} of >100 µg/bee (USEPA, 1985a *in* OPP Ecotox).

4.3.2 Triclopyr TEA

Triclopyr TEA is practically nontoxic to aquatic-phase amphibians based the LC_{50} of 159 mg/L for African clawed frogs (Perkins *et al*., 2000 *in* ECOTOX, 2018). Triclopyr TEA is practically nontoxic to freshwater aquatic invertebrate species based on the LC_{50} of 775 mg/L in water flea (USEPA, 1978c *in* OPP Ecotox). Triclopyr TEA is practically nontoxic to freshwater fish based on the LC_{50} of 240 mg/L in rainbow trout (USEPA, 1973a *in* OPP Ecotox).

No toxicity information was available for terrestrial-phase amphibians or reptiles. The toxicity of triclopyr TEA to terrestrial-phase amphibians and reptiles was considered similar to that in birds (USEPA, 2017). Triclopyr TEA is practically nontoxic to birds based on an LD_{50} of 3,176 mg/kg (USEPA, 1978d *in* OPP Ecotox) in mallard duck and slightly toxic to mammals based on an LD_{50} of 1,847 mg/kg (USEPA, 1998b). Triclopyr TEA is practically nontoxic to bees based on a contact LD_{50} of >100 µg/bee, testing triclopyr acid (USEPA, 1985b *in* OPP Ecotox).

4.3.3 Prallethrin

No toxicity information was available for aquatic-phase amphibians. Prallethrin is very highly toxic to freshwater aquatic invertebrate species based on the LC_{50} of 0.0062 mg/L in water flea (USEPA, 1989b *in* OPP Ecotox). Prallethrin is very highly toxic to freshwater fish and aquatic-phase amphibians based on the LC_{50} of 0.012 mg/L in rainbow trout (USEPA, 1989c *in* OPP Ecotox).

No toxicity information was available for terrestrial-phase amphibians or reptiles. The toxicity of prallethrin to terrestrial-phase amphibians and reptiles was considered similar to that in birds (USEPA, 2017). Prallethrin is, at most, slightly toxic to birds based on an LD_{50} of >1000 mg/kg (USEPA, 1989d *in* OPP Ecotox) in mallard duck and moderately toxic to mammals based on an LD_{50} of 460 mg/kg (USEPA, 2014b). Prallethrin is highly toxic to bees based on a contact LD_{50} of 0.028 µg/bee (USEPA, 1989e *in* OPP Ecotox).

5 Risk Characterization

Risk characterization is the final phase in the risk assessment process. The purpose of the risk characterization phase is to integrate the two pieces from the analysis phase: exposure and effects assessments. In risk characterization, exposure and effects data are integrated to allow the risk assessor to draw conclusions concerning the presence, nature, and magnitude of effects that may exist under the application scenarios. For this SLERA, qualitative assessments are relied upon to characterize the risk assessment outcome.

5.1 Potential for a Species to Be Present at the Application Site

One of the first qualitative attributes to consider is the likelihood of the specific species being present at a particular application site. Since species exist in particular habitats and not all habitats can occur at a single application site, it is likely that a fraction of the entire list of special-status species will possibly be present. For instance, if the application site does not contain suitable foraging habitat for a particular species, it is relatively unlikely to come into the area and be exposed to pesticide active ingredients or adjuvants by ingestion. Pollinating species are less likely to be present if there are no plants in bloom present. Some locations are unlikely to have any species present, such as in or around buildings. Marine/estuarine species would be absent if the application site is not near the coastline.

The District's standard practice prior to implementing any pesticide application scenario is to identify whether any special-status species habitat is nearby, and if so, identify appropriate measures to avoid adversely affecting the species. The District obtains technical assistance from California Department of Fish and Wildlife (CDFW), National Marine Fisheries Service (NMFS), and/or United States Fish and Wildlife Service (USFWS). These activities are included in the mitigation measures and BMPs of the 2014 EIR. With implementation of these mitigation measures and BMPs, the potential for adverse effects on species as a result of the District's pesticide applications would be low.

5.2 Foraging Diet

The extent to which a particular species consumes food from the application area will greatly influence their exposure. Different species forage over vastly different areas. Species with large foraging areas are unlikely to consume all their diet from within an application area. Long-term exposures (chronic) are reduced or diluted in such species because a portion of their diets is likely acquired off the application area.

5.3 Dilution and Degradation of Pesticide Active Ingredients and Adjuvants

Through time, concentrations of pesticide active ingredients and adjuvants following applications generally decrease. This applies in particular to soil and water concentrations. In addition to diminished concentrations due to breakdown, dilution (or reduction in concentration when mixed) will occur when the pesticide active ingredient or adjuvant residues combine with environmental media that is not contaminated. For instance, during a rain event that assists in transporting pesticide active ingredient or adjuvant residue from foliage and soil to a waterbody, additional, uncontaminated water will add to the volume of water in the waterbody itself. This

also applies to water concentrations as the pesticide active ingredient or adjuvant continues to move from various waterbodies, such as drainage ditches, streams, and rivers. Due to dilution and low probability of application scenarios being adjacent to a marine/estuarine waterbody, the potential for elevated concentrations in marine/estuarine waterbodies would be relatively low, and the potential for adverse effects to marine/estuarine species would be correspondingly low.

5.4 Risk Analysis for Pesticide Active Ingredients and Adjuvants Considered for Toxicity to California Giant Salamander and Santa Cruz Black Salamander

Santa Cruz black salamander do not have a fully aquatic larval stage, so toxicity testing of larval amphibians will not portray the toxic impacts for Santa Cruz black salamander very well. California giant salamander lay eggs and larvae develop in streams. The previous analysis for California tiger salamander which lays eggs in vernal pools or temporary ponds does not accurately reflect the potential for risk to aquatic phase Santa Cruz black salamander and California giant salamander.

The analysis of terrestrial phase California tiger salamanders will reflect reasonably well the potential for risk for California giant salamander since both species spend a lot of time in underground burrows. However, Santa Cruz black salamander spend more time in streams, so the analysis in the 2014 EIR for terrestrial-phase amphibians will not portray the potential for risk for the Santa Cruz black salamander very well.

Mitigation measures and BMPs included in the 2014 EIR are designed to greatly minimize or prevent pesticide active ingredients or adjuvants for reaching surface waters. These practices are anticipated to be protective of aquatic-phase amphibians.

5.4.1 Alcohol Ethoxylate

Alcohol ethoxylate was classified as moderately toxic to aquatic-phase amphibians and slightly toxic to terrestrial-phase amphibians. Alcohol ethoxylate is one of the ingredients in the adjuvant Liberate which could be mixed with herbicides and spot sprayed or applied as a cut-stump, basal bark, or frill/injection treatment or as a wick application. When applied as a cut-stump, basal bark, or frill/injection treatment or as a wick application or spot spray treatment, the potential for exposure to either terrestrial-phase or aquatic-phase amphibians is low. The greatest opportunity for exposure for terrestrial-phase amphibians would be following a spot spray or wick application made to a large stand of weeds. The potential for exposure to aquatic-phase amphibians would be low since BMPs minimize or prevent any movement to surface waters. Due to the low potential for exposure and the low toxicity, the potential for adverse effects is also low.

5.4.2 Alkylphenol Ethoxylate

Alkylphenol ethoxylate was classified as moderately toxic to aquatic-phase amphibians and slightly toxic to terrestrial-phase amphibians. Alkylphenol ethoxylate is a component of the adjuvant Pentra-Bark and is only used to spray or inject tree trunks. Since it would only be sprayed directly onto or injected into trees, the potential for exposure to terrestrial-phase amphibians would be extremely low. The potential for exposure for aquatic-phase amphibians is

also low since mitigation measures and BMPs minimize or prevent any movement to surface waters. Due to the low potential for exposure and the low toxicity, the potential for adverse effects is also low.

5.4.3 Canola Oil, Ethyl and Methyl Esters

Canola oil was classified as slightly toxic to aquatic-phase amphibians and practically nontoxic to terrestrial-phase amphibians. Canola is one of the ingredients in the adjuvant Competitor which could be sprayed with herbicides as a spot spray or applied as a cut-stump, basal bark, or frill/injection treatment, or as a wick application. When applied as a cut-stump, basal bark, or frill/injection treatment, or as a wick application or spot spray treatment, the potential for exposure to either terrestrial-phase or aquatic-phase amphibians is low. The greatest opportunity for exposure for terrestrial-phase amphibians would be following a spot spray or wick application made to a large stand of weeds. The potential for exposure to aquatic-phase amphibians would be low since mitigation measures and BMPs minimize or prevent any movement to surface waters. Due to the low potential for exposure and the low toxicity, the potential for adverse effects is also low.

5.4.4 Lecithin

Lecithin was classified as slightly toxic to aquatic-phase amphibians and practically nontoxic to terrestrial-phase amphibians. Lecithin is one of the ingredients in the adjuvant Liberate which could be sprayed with herbicides as a spot spray or applied as a cut-stump, basal bark, or frill/injection treatment, or as a wick application. When applied as a cut-stump, basal bark, or frill/injection treatment, or as a wick application or spot spray treatment, the potential for exposure to either terrestrial-phase or aquatic-phase amphibians is low. The greatest opportunity for exposure for terrestrial-phase amphibians would be following a spot spray or wick application made to a large stand of weeds. The potential for exposure to aquatic-phase amphibians would be low since mitigation measures and BMPs minimize or prevent any movement to surface waters. Due to the low potential for exposure and the low toxicity, the potential for adverse effects is also low.

5.4.5 Phosphite, mono-/di-potassium salts

Monopotassium and dipotassium phosphite salts were classified as practically nontoxic to aquatic-phase amphibians and, at most, slightly toxic to terrestrial-phase amphibians. Products containing phosphite salts are used solely in the District as a fungicide to treat sudden oak death (SOD). The low toxicity for aquatic-phase amphibians and terrestrial-phase amphibians and the limited use pattern lead to a conclusion that use of phosphite salts in the District would pose a low potential for adverse effects for California giant salamander and Santa Cruz black salamander.

5.4.6 Aminopyralid TIPA

Aminopyralid TIPA was classified as, at most, slightly toxic to aquatic-phase amphibians and practically nontoxic to terrestrial-phase amphibians. Products containing aminopyralid TIPA as the sole active ingredient (*e.g.* Milestone) could be used in the District for control of invasive

weeds in rangeland, agricultural fields, or in natural lands via spot spray, cut-stump, basal bark, wick, or frill/injection applications. Refer to Section 5.5.2 for information on use sites and application methods associated with Capstone, which contains both aminopyralid TIPA and triclopyr TEA as active ingredients. Despite the possibility of use in a wide variety of settings, the low toxicity of aminopyralid TIPA to both aquatic-phase amphibians and terrestrial-phase amphibians indicates it poses a low risk for California giant salamander and Santa Cruz black salamander when used as a spot spray or wick application for control in invasive weeds or for woody plants used as cut-stump, basal bark, or frill/injection applications in the District.

5.4.7 Clethodim

Clethodim was classified as slightly toxic to aquatic-phase amphibians and practically nontoxic to terrestrial-phase amphibians. Clethodim could be used in the District for control of invasive grass species in natural lands. Its use in natural lands suggests it could be spot sprayed near salamander habitat. However, the low toxicity of clethodim to both aquatic-phase amphibians and terrestrial-phase amphibians indicates it poses a low risk for California giant salamander and Santa Cruz black salamander when used in the District.

5.4.8 Clopyralid MEA

Clopyralid MEA was classified as practically nontoxic to aquatic-phase amphibians and slightly toxic to terrestrial-phase amphibians. Clopyralid MEA could be used in recreational facilities, rangeland, agricultural fields, and natural lands as a spot spray or wick application for weeds such as thistles and clover or for brush and woody plant control as cut-stump or frill/injection applications. Its use in a variety of settings suggest it could be applied near salamander habitat. However, the low toxicity of clopyralid MEA to both aquatic-phase amphibians and terrestrial-phase amphibians indicates it poses a low risk for California giant salamander and Santa Cruz black salamander when used in the District.

5.4.9 Glyphosate IPA

Glyphosate IPA was classified as moderately toxic to aquatic-phase amphibians and practically nontoxic to terrestrial-phase amphibians. Glyphosate IPA is the active ingredient in the terrestrial and aquatic herbicides containing glyphosate. Products containing glyphosate IPA can be used as a spot spray, cut-stump, wick, or frill/injection treatment in recreational facilities (including on dam faces), natural lands, and rangeland and agricultural properties. Therefore, there is the potential for glyphosate IPA to be used near aquatic habitats where aquatic-phase amphibians could occur. The mitigation measures and BMPs in the 2014 EIR require scouting aquatic habitats prior to applying pesticides. Adherence to the mitigation measures and BMPs is anticipated to minimize or prevent exposure of aquatic-phase amphibians. The limited potential for exposure for aquatic phase Santa Cruz black salamander and the low toxicity of glyphosate for terrestrial-phase amphibians indicates the potential is low for adverse effects for California giant salamander and Santa Cruz black salamander following the use of glyphosate IPA for control of a wide spectrum of weed species, including use as a spot spray, cut-stump, wick, or frill/injection application in the District.

5.4.10 Glyphosate K

Glyphosate K was classified as, at most, moderately toxic to aquatic-phase amphibians and practically nontoxic to terrestrial-phase amphibians. Glyphosate K is the active ingredient in the terrestrial-only herbicides containing glyphosate. Products containing glyphosate K can be applied via spot spray, cut-stump, wick, or frill/injection treatment in recreational facilities, fuel management sites, natural lands, and rangeland and agricultural properties. The mitigation measures and BMPs in the 2014 EIR limit the use of glyphosate K near aquatic habitats. Adherence to the mitigation measures and BMPs is anticipated to minimize or prevent exposure of aquatic-phase amphibians. The limited potential for exposure for aquatic phase Santa Cruz black salamander and the low toxicity of glyphosate for terrestrial-phase amphibians indicates the low potential for adverse effects for California giant salamander and Santa Cruz black salamander following the use of glyphosate K for control of a wide spectrum of weed species, including use as a spot spray, cut-stump, wick, or frill/injection treatment in the District.

5.4.11 Imazapyr IPA

Imazapyr IPA was classified as practically nontoxic to aquatic-phase amphibians and practically nontoxic to terrestrial-phase amphibians. Products containing imazapyr IPA can be used in recreational facilities and natural lands for spot spray of a broad spectrum of invasive weeds or cut-stump or frill/injection treatments. Since products containing imazapyr IPA could be used in natural lands, it could be sprayed near salamander habitat. However, its low toxicity leads to a conclusion that imazapyr IPA would pose a low potential for risk for California giant salamander and Santa Cruz black salamander when used in the District.

5.4.12 Diatomaceous Earth

Diatomaceous earth is used within the District only for control of structural pests in and around buildings. Therefore, it is unlikely that aquatic-phase amphibians could be exposed to diatomaceous earth. Diatomaceous earth was classified practically nontoxic to terrestrial-phase amphibians. The limited use of diatomaceous earth in and around buildings along with its low toxicity leads to the conclusion that the use of diatomaceous earth in the District would pose low to no risk for California giant salamander and Santa Cruz black salamander.

5.4.13 Fipronil

Fipronil was classified as highly toxic to aquatic-phase amphibians and terrestrial-phase amphibians. However, within the District, fipronil is used only in and around buildings for control of structural pests. The limited use of fipronil in and around buildings, despite its high toxicity, leads to the conclusion that the use of fipronil in the District would pose low risk for California giant salamander and Santa Cruz black salamander.

5.4.14 Indoxacarb

Indoxacarb was classified as highly toxic to aquatic-phase amphibians and moderately toxic to terrestrial-phase amphibians. However, within the District, indoxacarb is used only in and around buildings for control of structural pests. The limited use of indoxacarb in and around buildings,

despite its moderate to high toxicity, leads to the conclusion that the use of indoxacarb in the District would pose low risk for California giant salamander and Santa Cruz black salamander.

5.4.15 S-Hydroprene

S-Hydroprene was classified as practically nontoxic to aquatic-phase amphibians and terrestrial-phase amphibians. S-Hydroprene is used within the District only for control of structural pests in and around buildings. The limited use of S-hydroprene in and around buildings along with its low toxicity leads to the conclusion that the use of S-hydroprene in the District would pose low to no risk for California giant salamander and Santa Cruz black salamander.

5.4.16 Sodium Tetraborate Decahydrate

Sodium tetraborate decahydrate was classified as practically nontoxic to aquatic-phase amphibians and terrestrial-phase amphibians. Sodium tetraborate decahydrate is used within the District only for control of structural pests in and around buildings. The limited use of sodium tetraborate decahydrate in and around buildings along with its low toxicity leads to the conclusion that the use of sodium tetraborate decahydrate in the District would pose low to no risk for California giant salamander and Santa Cruz black salamander.

5.4.17 Cholecalciferol

Cholecalciferol was classified as, at most, slightly toxic to terrestrial-phase amphibians and no classification of toxicity was possible for aquatic-phase amphibians. Cholecalciferol is limited to use for control of rodents inside buildings in the District. Use inside buildings precludes any chance that aquatic-phase amphibians will be exposed. The low toxicity for terrestrial-phase amphibians leads to the conclusion that use of cholecalciferol, on the slight chance an adult salamander might wander into a building, poses a low to no potential for risk to California giant salamander and Santa Cruz black salamander in the District.

5.5 Risk Analysis for New Active Ingredients Considered for Toxicity to All Special-Status Species

5.5.1 Triclopyr BEE

Triclopyr BEE is intended for use for fuel management and invasive weed control in natural lands and at the wildland urban interface, in rangeland and agricultural properties as a spot spray, cut-stump, and basal bark treatment. The potential for use in a wide variety of habitats provides an opportunity for many special-status species to be exposed following applications of triclopyr BEE.

5.5.1.1 Risk to Aquatic Special-Status Species

Triclopyr BEE was classified as moderately toxic to aquatic-phase amphibians, moderately toxic to freshwater aquatic invertebrate species, and highly toxic to freshwater fish. Mitigation measures and BMPs in the 2014 EIR were incorporated to minimize or prevent the movement into surface waters of any pesticides used in the District. Implementation of the mitigation

measure and BMPs is anticipated to lead to a low potential for risk to aquatic special-status species following the use of triclopyr BEE for invasive weed control and fuel management within the District.

5.5.1.2 Risk to Terrestrial Special-Status Species

The toxicity of triclopyr BEE to terrestrial-phase amphibians and reptiles was considered similar to that in birds. Triclopyr BEE was classified as slightly toxic to birds and mammals, and practically nontoxic to bees. The wide variety of habitats where triclopyr BEE could be used suggests a moderate to high potential for exposure to special-status species following applications of triclopyr BEE for invasive weed control or fuels management. However, the low toxicity leads to a conclusion of a low potential for risk for terrestrial special-status species in the District.

5.5.2 Triclopyr TEA

Triclopyr TEA in Capstone is intended for use in natural lands and rangeland and agricultural properties as a spot spray for the control of invasive weeds and cut-stump or frill/injection for control of woody vegetation. The potential for use in multiple habitats provides an opportunity for many special-status species to be exposed following applications of triclopyr TEA. Note that Capstone contains both triclopyr TEA and aminopyralid TIPA. Refer to Section 5.4.6 for information on use sites and application methods associated with only aminopyralid TIPA.

5.5.2.1 Risk to Aquatic Special-Status Species

Triclopyr TEA was classified as practically nontoxic to aquatic-phase amphibians, freshwater aquatic invertebrate species, and freshwater fish. Implementation of the mitigation measures and BMPs in the 2014 EIR along with the low toxicity lead to the conclusion of a low potential for risk to aquatic special-status species following the use of triclopyr TEA for invasive weed control within the District.

5.5.2.2 Risk to Terrestrial Special-Status Species

The toxicity of triclopyr TEA to terrestrial-phase amphibians and reptiles was considered similar to that in birds. Triclopyr TEA was classified as practically nontoxic to birds, mammals, and bees. Use of triclopyr TEA in multiple habitats suggests a moderate to high potential for exposure to special-status species following applications of triclopyr TEA for invasive weed or woody plant control. However, the low toxicity leads to a conclusion of a low potential for risk for terrestrial special-status species in the District.

5.5.3 Prallethrin

Prallethrin is intended for use around buildings and in recreational facilities, for control of stinging insects such as wasps or yellow jackets. Treatments in recreational facilities could include treatment of ground nests along hiking trails.

5.5.3.1 Risk to Aquatic Special-Status Species

Toxicity for aquatic-phase amphibians is anticipated to be similar to that determined for freshwater fish. Prallethrin was classified as very highly toxic to freshwater aquatic invertebrate species and freshwater fish. Despite being considered highly toxic to aquatic species, prallethrin is not anticipated to pose a high risk to aquatic special-status species because of its very limited use. The use being limited to around buildings and along trails in recreational areas indicates such low potential for exposure of aquatic special-status species that the potential for risk is low.

5.5.3.2 Risk to Terrestrial Special-Status Species

The toxicity of prallethrin to terrestrial-phase amphibians and reptiles was considered similar to that in birds. Prallethrin was classified as, at most, slightly toxic to birds, moderately toxic to mammals, but highly toxic to bees. The limited nature of use of prallethrin to treatment around buildings and to ground nests of stinging insects along hiking trails greatly limits the potential for exposure for special-status terrestrial vertebrate species. Mitigation Measure 4-2.1c specifically addresses special-status terrestrial invertebrate species. Adherence to Mitigation Measure 4-2.1c and the very limited nature of the use pattern leads to a conclusion that the risk from the use of prallethrin for control of stinging insects in the District is low.

6 Uncertainties

Uncertainty in ecological risk assessment derives partly from biological variability. The response of ecological receptors following exposure to contaminants will vary among individuals within a species as well as across species. Also, literature values from various species are used to predict the response of the species of interest in this SLERA. The differences among species always introduces unavoidable uncertainty to a SLERA. Uncertainty regarding predictions in a risk assessment may be due to inherent randomness, limited knowledge, or lack of knowledge (Suter, 2007).

6.1 Exposure Assessment Uncertainties

In this SLERA, exposure of ecological receptors could not be directly measured. The application equipment, areal extent, and location were all considered in a qualitative assessment of exposure. Past pesticide use information was used as a guide to likely future use, with the understanding that the program is likely to expand (See Section 3 of the Addendum Report).

Pesticide application scenarios were based on descriptions provided by District staff. Past pesticide use patterns provide an excellent indicator of likely future use. The most common conditions under which applications have been made were evaluated, but some uncommon conditions that could lead to greater or lesser exposure than the scenarios represented in the risk assessment were not specifically considered. It is possible that smaller or larger application areas than used in this SLERA could occur in the future.

Most herbicide applications are spot applications where only the target pest plants are treated. Past records indicate the area in which the treatments were made and the amount of herbicide

applied. However, the distribution within the treated area was not described, so the uniformity of the application across the landscape is not known, nor can it be predicted for future applications. This creates uncertainty regarding the concentrations of herbicides within small areas of the larger treated area. It is possible that target weed species exhibited a clumped distribution and might do so in the future which would produce an uneven distribution of herbicides across the landscape.

Since this SLERA is attempting to address potential future applications of pesticides, the proximity of application sites is not known. For species with large foraging areas, more than one application site could occur within a species' foraging range. Without knowing the distribution of application sites across a species foraging range, the appropriateness of any exposure estimates cannot be known.

6.2 Effects Assessment Uncertainties

6.2.1 Use of Surrogate Species Effects Data

Toxicity data were rarely available for the special-status species considered in the risk assessment. Use of effects data from species other than the species of concern inherently added uncertainty to the assessment. When toxicity data for more than one species was available, the more sensitive species was selected.

Toxicity data were not always available for all taxonomic groups. This was most common for amphibians and reptiles. Bird or fish toxicity data were used when no data were available for terrestrial-phase amphibians and reptiles or aquatic-phase amphibians, respectively. It was not known when this approach might lead to an over or underestimation of risk.

6.2.2 Sublethal Effects

Sublethal effects were not specifically addressed, but when ecologically relevant sublethal toxicity endpoints were available, they were included in the reference toxicity data.

6.2.3 Dermal or Inhalation Effects

In SLERAs, it is standard practice to only address effects from oral exposure to terrestrial vertebrates. In general, focusing on effects from oral exposures is adequate (Suter, 2007: pp. 258-259). However, for terrestrial-phase amphibians, it is possible that dermal exposure to pesticide active ingredient or adjuvants on surface soils might be readily absorbed and contribute to adverse effects in these species. Effects data for this pathway do not exist, so any effects from contact of terrestrial-phase amphibians to pesticide active ingredient or adjuvants in soils are unknown. Also, inhalation exposure to airborne pesticide active ingredient or adjuvants can occur. Effects data from inhalation exposure are also lacking for wildlife species. The inability to include any potential risk derived from dermal or inhalation exposure will necessarily underestimate total risk, but since these routes are thought to generally be negligible, exclusion of exposure from these routes did not seriously affect the assessment of risk.

7 Conclusions

This SLERA was conducted to determine the potential harm to ecological receptors from implementation of previously assessed pesticide active ingredients and adjuvants to California giant salamander and Santa Cruz black salamander. These two species were not considered special-status species at the time of the 2014 EIR. This SLERA also considered the potential for adverse effects from applications of products containing triclopyr BEE, triclopyr TEA, and prallethrin for all special-status species that could occur within the District. The SLERA consisted of a qualitative assessment of exposure and along with an evaluation of whether the level of exposure might be sufficient to produce adverse effects, based on the toxicity of the pesticide active ingredients and adjuvants. The SLERA relied upon the three-stage process for risk assessments: problem formulation, analysis, and risk characterization. The problem formulation stage concluded with a CSM that identified the complete exposure pathways carried forward in the analysis based on information that was available to evaluate the potential exposure pathways. During the analysis phase of the SLERA, qualitative exposure estimates were considered based on application scenarios. Also in the analysis phase, effect values were identified which incorporated the toxicity properties of the pesticide active ingredient or adjuvants. The risk characterization phase provided conclusions on the potential for adverse effects to occur to ecological receptors. The risk characterization phase utilized a qualitative assessment.

Section 5 lists the results of the risk characterization phase for every species class. As described in Section 5, the qualitative assessment considers the potential for species presence at an application site, incorporation of foraging range and diet, and fate and transport processes such as dilution and degradation.

The District's BMPs are designed to greatly reduce, if not eliminate, movement to surface water. Therefore, actual impacts to aquatic invertebrates or birds and mammals that feed in aquatic habitats are anticipated to be minimal. Herbicides exhibit low toxicity to terrestrial animals. Although there is a greater chance of exposure for special-status terrestrial animals, the low toxicity leads to a conclusion that terrestrial special-status species are not at risk. Some insecticides exhibit high toxicity to ecological receptors, mostly aquatic species. However, their restricted uses to in and around buildings limits exposure such that it can be concluded that adverse effects will not occur. Because of the targeted nature of prallethrin applications to stinging insect nests, only those species would be directly exposed. Most insects, such as flying insects, would receive no exposure following an application to a wasp or hornet nest. Thus, most insects and insectivorous species are anticipated to be exposed to very limited amounts of prallethrin, leading to a conclusion that no special-status species are at risk.

This SLERA along with the 2014 EIR will be used to assist the District in assessing the potential to affect particular species and developing site-specific measures to protect these species. This SLERA did not identify new significant environmental effects or substantial increases in the severity of the significant effects identified in the 2014 EIR. No alterations to any of the scenarios assessed in this SLERA that were not already indicated for other scenarios in the 2014 EIR are recommended for the protection of biological resources.

8 Literature

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