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Summary

This summary of the Alameda County Mosquito Abatement District's Programmatic Environmental Impact Report (PEIR) on the continuation of their Integrated Mosquito Management Program (IMMP or Program) presents an overview of the PEIR contents. It introduces key components of the Proposed Program and provides a summary of the potential environmental impacts of the Program Alternatives. The text of the PEIR is supplemented by five technical reports included as appendices. The Alameda County Mosquito Abatement District, as Lead Agency under the California Environmental Quality Act (CEQA), has prepared this PEIR for their ongoing program of surveillance and control of mosquitoes, vectors of human disease and discomfort.

S.1 Background

The District was established in 1930 to reduce the risk of mosquito-borne disease and discomfort to the residents of its Service Area. The District engages in activities and management practices to control mosquitoes and to address the specific situations within its Service Area. These management practices emphasize the fundamentals of integrated pest management (IPM) wherein source reduction, habitat modification, and biological control are used when appropriate before using pesticides. When pesticides are used, they are applied in a manner that minimizes risk to human health and ecological health. To avoid or manage the risk to human and animal health requires effective mosquito-borne disease surveillance and control strategies that may fluctuate temporally and regionally. Factors that influence the selected strategies include mosquito and pathogen biology, environmental factors, land use patterns, and resource availability to support production of the vectors in quantities that threaten human and animal health.

S.1.1 Mosquito-Borne Diseases in Program Areas

Certain mosquito species can transmit a number of diseases. A vector is defined by the State of California as "any animal capable of transmitting the causative agent of human disease or capable of producing human discomfort or injury, including, but not limited to, mosquitoes, flies, other insects, ticks, mites, and rats, but not including any domesticated animal…" [California Health and Safety Code Section 2002(k)]. The diseases of most concern in the Program Area are West Nile virus (WNV), western equine encephalomyelitis (WEE), St. Louis Encephalitis (SLE), dog heartworm, and malaria.

Depending on the disease, both human and domestic animal health can be at risk of disability, illness, and/or death. Furthermore, potential exists for introduction of new disease vectoring mosquito species into the District's Service Area.

S.1.2 Authority to Implement Vector Control

A number of legislative and regulatory actions form the basis for the District's authority to engage in vector control. The District's principal authority is derived from the California Health and Safety Code. It is a regulatory agency formed pursuant to California Health and Safety Code Section 2000 et seq. **State law charges the District with the authority and responsibility to take all necessary or proper steps for the control of mosquitoes and other vectors in the District.**

In accordance with California Health and Safety Code Section 2053:

(a) A district may request an inspection and abatement warrant pursuant to Title 13 (commencing with Section 1822.50) of Part 3 of the Code of Civil Procedure. A warrant issued pursuant to this section shall apply only to the exterior of places, dwellings, structures, and premises. The warrant

shall state the geographic area which it covers and shall state its purposes. A warrant may authorize district employees to enter property only to do the following:

(1) Inspect to determine the presence of vectors or public nuisances.

(2) Abate public nuisances, either directly or by giving notice to the property owner to abate the public nuisance.

(3) Determine if a notice to abate a public nuisance has been complied with.

(4) Control vectors and treat property with appropriate physical, chemical, or biological control measures.

The California Department of Pesticide Regulation's (CDPR's) Pesticide Regulatory Program provides special procedures for vector control agencies that operate under a Cooperative Agreement with the California Department of Public Health (CDPH). The application of pesticides by vector control agencies is regulated by a special and unique arrangement among the CDPH, CDPR, and County Agricultural Commissioners. CDPR does not directly regulate vector control agencies. CDPH provides regulatory oversight for vector control agencies that are signatory to the Cooperative Agreement. This relationship includes consultation, technical assistance, and the certification of vector control technicians. The Cooperative Agreement governs routine surveillance, prevention, and control activities for vectors and vector-borne diseases. Signatories to the agreement use only pesticides listed by CDPH, maintain pesticide use reports, and ensure that pesticide use does not result in harmful residues on agricultural products.

The District maintains a cooperative agreement with CDPH. Its employees are certified by CDPH as vector control technicians, which helps to ensure that employees are adequately trained regarding safe and proper vector control techniques including the handling and use of pesticides and compliance with laws and regulations relating to vector control and environmental protection.

S.2 Program Objectives and Purpose

The District undertakes mosquito control activities through its Program to control all mosquitoes that may be vectors of disease and/ or discomfort in the Program Area. In order to effectively control those mosquitoes, the District may potentially undertake control measures for yellow jacket wasps and noxious/invasive weeds.

The Proposed Program's specific objectives are as follows:

> Reduce the potential for human and animal disease caused by mosquitoes

> Reduce the potential for human and animal discomfort or injury from mosquitoes

> Accomplish effective and environmentally sound mosquito management by means of:

- Surveying for mosquito abundance/human contact
- Establishing treatment criteria
- Appropriately selecting from a wide range of Program tools or components

Most of the relevant mosquito species are quite mobile and cause the greatest hazard or discomfort at a distance from where they breed. Each potential mosquito species has a unique life cycle, and most of them occupy several types of habitats. To effectively control them, an IMMP must be employed. District policy is to identify those mosquito species that are currently vectors, to recommend techniques for their prevention and control, and to anticipate and minimize any new interactions between mosquitoes and humans.

S.3 Public Involvement Summary

Public involvement for this PEIR includes the following actions.

The District distributed a Notice of Preparation (NOP) of a Draft PEIR for the IMMP pursuant to the CEQA Guidelines (Section 15082) on May 11, 2012. The NOP was sent to 165 agencies, organizations, and individuals, including the following state responsible and trustee agencies:

> California Coastal Commission

> California Department of Fish and Wildlife, Region 3

> California Department of Parks and Recreation

> California Department of Pesticide Regulation

> California Department of Toxic Substances Control

> California Department of Water Resources

> California Highway Patrol

> California Natural Resources Agency

> Caltrans, District 4

> Delta Stewardship Council

> Native American Heritage Commission

> San Francisco Bay Conservation and Development Commission

> San Francisco Bay Regional Water Quality Control Board (Region 2)

The NOP provided a description of the Program, the location of Program activities, and the resources and environmental concerns planned for analysis in the PEIR. The NOP announced a public scoping meeting and requested that comments on the content of the PEIR and the Program alternatives be submitted within 30 days of receipt. The public scoping meeting was held at the following location and time:

- Alameda County Department of Environmental Health, Alameda, on June 6, 2012 from 5:30 p.m. - 7:30 p.m.

Comments received during scoping on the content of the PEIR are addressed in the resource chapters.

S.4 Areas of Known Public Environmental Concerns

The areas of greatest public controversy based on comments from public scoping, other District activities, and historical questions raised by individuals in the Program Area are:

> Use of Pesticides for Mosquito Control: Members of the public are distrustful of pesticide use for mosquito control. They prefer other methods to eliminate suitable habitat to deal with mosquito problems rather than spraying pesticides. If adulticides must be used, ensure use is justified with documented, mosquito-borne disease activity within or within flight range of the tidal marsh. Concern exists about pesticide applications drifting into backyards where the property owner wants to ensure their area is pesticide-free. The concern is not only with impacts to humans and “sensitive populations” but also to domestic animals and wildlife including nontarget insects.

> Use of Herbicides for Vegetation Management: Request for specific vegetation management information about the proposed chemical vegetation control agents (herbicides), the types, amounts and locations of chemical stored, application methods and rates, and their effects on the environment.

> Use of Biological Control Agents: Controversy exists over the use of some proposed biological control agents, in particular the use of mosquitofish and potential for them to impact sensitive species such as the California red-legged frog.

> District's Authority to Enter Public and Private Property for Control Activities: Some public agencies want the District to obtain an Encroachment Permit with notification of Park Supervisors for activities such as surveillance, physical control, or vegetation management where access to parkland is needed. Water districts insist that mosquito abatement materials and practices proposed for use on watershed lands must be thoroughly vetted and approved by CDPH.

S.5 Proposed Program Alternatives

S.5.1 Proposed Program

Since 1930, the District has, taken an integrated systems approach to mosquito control, utilizing a suite of tools that consist of surveillance, vegetation management, and physical, biological, and chemical controls along with public education. These Program "tools" or components are described herein as "Program alternatives" for the CEQA process (except for public education, which is exempt from CEQA). Program implementation incorporates vegetation management and physical and biological control, in part, to reduce the need for chemical control. To realize effective and environmentally sound mosquito management, mosquito control must be based on several factors:

1. Carefully monitoring or surveying mosquito abundance and/or potential contact with people
2. Carefully monitoring and surveying for mosquito diseases and their antecedent factors that initiate and/or amplify disease
3. Establishing treatment criteria (thresholds)
4. Selecting appropriate tools from a wide range of control methods

This ongoing Program consists of a dynamic combination of surveillance, treatment criteria, and use of multiple control activities in a coordinated program with public education that is generally known as Integrated Pest Management (IPM) or Integrated Mosquito Management (IMM).

While these Program components or tools together encompass the District's IMMP, it is important to acknowledge that the specific tools District staff use vary from day to day and from site to site in response to the mosquito species that are active, their population size or density, their age structure, location, time of year, local climate and weather, potential for mosquito-borne disease, proximity to human populations, including (a) proximity to sensitive receptors, (b) District staff's access to mosquito habitat, (c) abundance of natural predators, (d) availability and cost of control methods, (e) effectiveness of previous control efforts at the site, (f) potential for development of resistance in mosquito populations, (g) landowner policies or concerns, (h) proximity to special status species, and (i) applicability of Endangered Species Recovery Plans, Habitat Conservation Plans (HCPs), Natural Community Conservation Plans (NCCPs), and local community concerns, among other variables. Therefore, the specific actions taken in response to current or potential mosquito activity at a specific place and time depend on factors of mosquito and pathogen biology, physical and biotic environment, human settlement patterns, local standards, available control methods, and institutional and legal constraints. While some consistent mosquito sources are exposed to repeated control activity, many areas with minor mosquito activity are not routinely treated, and most of the land within the District's Service Area has never been directly treated for mosquitoes.

The District has implemented a number of procedures and practices under current Program activities that would continue into the future for the Proposed Program. These best management practices (BMPs) represent measures to avoid, minimize, or eliminate potential adverse effects on the human, biological, and physical environments and on District Staff. While similar to mitigation measures under CEQA, these BMPs are already in use and would continue as part of the Proposed Program. Subsequent

environmental impact assessments in this PEIR reflect the continued use of these measures, which are organized under the following categories:

> General BMPs

> Tidal Marsh-Specific BMPs

> Salt Marsh Harvest Mouse (SMHM)

> Ridgway's Rail (RR)

> California Least Tern (CLT)

> Western Snowy Plover (WSnPl)

> California Tiger Salamander (CTS)

> Vernal Pool Tadpole Shrimp (VPTS)

> Contra Costa Goldfields (CCG)

> Palmate-Bracted Bird's Beak (PBBB)

> Vegetation Management

> Maintenance/Construction and Repair of Tide Gates and Water Structures in Waters of the U.S.

> Applications of Pesticides, Surfactants, and/or Herbicides

> Hazardous Materials Spill Management

> Worker Illness and Injury Prevention Program and Emergency Response

The District will observe all state and federal regulations. The District will follow all appropriate laws and regulations pertaining to the use of pesticides and herbicides and safety standards for employees and the public, as governed by the USEPA, CDPR, and local jurisdictions (with some exceptions). Although the products the District uses are all tested, registered, and approved for use by the USEPA and/or CDPR, the District provides additional margins of safety with the adherence to additional internal guidance based on BMPs and the principles embodied in District IMMP policies, where applicable.

> Ensure all District and contracted applicators are appropriately licensed by the state.

> District staff or contractors will coordinate with the Alameda County Agricultural Commissioner, and obtain and verify all required licenses and permits as current prior to pesticide/herbicide application.

All applicators and handlers will use proper personal protective equipment.

The District anticipates combining the following ongoing alternatives into its Proposed Program, a continuation of its existing Program. The five alternatives evaluated in this PEIR are discussed below.

S.5.1.1 Surveillance

Mosquito surveillance, which is an integral part of the District's responsibility to protect public health and welfare, involves monitoring mosquito populations and habitat, their disease pathogens, and human-mosquito interactions. Surveillance provides the District with valuable information on what mosquito species are present or likely to occur, when they occur, where they occur, how many they are, and if they are carrying disease or otherwise affecting humans. Mosquito surveillance is critical to an IMMP because the information it provides is evaluated against treatment criteria to decide when and where to institute mosquito control measures. Information gained is used to help form action plans that can also assist in reducing the risk of contracting disease. Equally important is the use of mosquito surveillance in evaluating the efficacy, cost effectiveness, and environmental impacts of specific mosquito control

actions. Examples include field counting/sampling and trapping, arbovirus surveillance, field inspection of known of suspected habitats, and documenting public service inquiries and requests.

S.5.1.2 Physical Control

Managing mosquito habitat to reduce mosquito production or migration, either directly or through public education is often the most cost-effective and environmentally benign element of an IPM program. This approach to the control of mosquitoes is often called "physical control" to distinguish it from those management activities that directly rely on application of chemical pesticides (chemical control) or the introduction or relocation of living agents (biological control). Other terms that have been used for mosquito habitat management include "source reduction," which emphasizes the significance of reducing the habitat value of an area for mosquitoes, or "permanent control," to contrast with the temporary effectiveness of pesticide applications.[10] Physical control is managing mosquito habitat to reduce mosquito production through "source control' measures that are nonchemical or nonbiological techniques. In many cases, physical control activities involve restoration and enhancement of natural ecological functioning. These activities include, but are not limited to, water management and maintenance of channels, tide gates, levees, and other water control facilities to improve water circulation.

S.5.1.3 Vegetation Management

The species composition and density of vegetation are basic elements of the habitat value of any area for mosquitoes, for predators of mosquitoes, and for protected flora and fauna. District staff periodically undertake vegetation management activities as a tool to reduce the habitat value of sites for mosquitoes, to aid production or dispersal of mosquito predators, or to allow District staff access to mosquito habitat for surveillance and other control activities. Vegetation management activities reduce the mosquito habitat value of sites by improving water circulation or access by fish and other predators, and allow District staff access to standing water for inspections and treatments. For vegetation management, the District uses hand tools for vegetation removal or thinning and could potentially use other mechanical means (i.e., heavy equipment) or apply herbicides (chemical pesticides with specific toxicity to plants) to improve surveillance or reduce mosquito habitats. Vegetation removal or thinning primarily occurs in aquatic habitats to assist with the control of mosquitoes and in terrestrial habitats to help with access to mosquito habitats. Vegetation management, when applicable to mosquito habitat management, may also be performed to assist other agencies and landowners with the management of invasive/nonnative weeds (e.g., spartina, pepperweed, arundo, tamarix, and ailanthus). These actions are typically performed under the direction of the concerned agency, which also maintains any required permits.

S.5.1.4 Biological Control

Pathogens

Mosquito pathogens are highly host-specific and usually infect mosquito larvae when they are ingested. Upon entering the host, these pathogens multiply rapidly, destroying internal organs and consuming nutrients. The pathogen can be spread to other mosquito larvae in some cases when larval tissue disintegrates and the pathogens are released into the water to be ingested by uninfected larvae. Examples of bacteria pathogenic to mosquitoes are *Bacillus sphaericus* (Bs), the several strains of *Bacillus thuringiensis israelensis* (Bti), and *Saacharopolyspora spinosa*. Two bacteria, Bs and Bti, produce proteins that are toxic to most mosquito larvae, while *Saacharopolyspora spinosa* produces compounds known as spinosysns, which effectively control all larval mosquitoes. Bs can reproduce in natural settings for some time following release. Bti materials the District applies do not contain live organisms, but only spores made up of specific protein molecules.

[10] This terminology can be misleading if periodic maintenance is needed for physical control devices or structure.

Predators

Mosquito predators are represented by highly complex organisms, such as insects, fish, birds, and bats that consume larval or adult mosquitoes as prey. Predators are opportunistic in their feeding habits and typically forage on a variety of prey types, which allows them to build and maintain populations at levels sufficient to control mosquitoes, even when mosquitoes are scarce. Examples of mosquito predators include representatives from a wide variety of taxa: coelenterates, *Hydra* spp.; platyhelminths, *Dugesia dorotocephala, Mesostoma lingua, and Planaria* spp.; insects, *Anisoptera, Zygoptera, Belostomidae, Geridae, Notonectidae, Veliidae, Dytiscidae, and Hydrophilidae*; arachnids, *Pardosa* spp.; mosquitofish, *Gambusia affinis*, *Gasterosteus aculeatus*; bats; and birds, *anseriformes, apodiformes, charadriiformes, and passeriformes*. Only mosquitofish are commercially available to use at present, while the District supports the presence of the other species as practical. The District's rearing and stocking of mosquitofish in mosquito habitat is the most commonly used biological control agent for mosquitoes in the world. The District limits planting of mosquitofish to artificial water bodies including ornamental fish ponds, water troughs, water gardens, fountains, and unmaintained swimming pools.

S.5.1.5 Chemical Control

Chemical control is a Program tool that consists of the application of nonpersistent insecticides (and potentially herbicides noted under S.5.1.3 above) to directly reduce populations of larval or adult mosquitoes. If and when inspections reveal that mosquito populations are present at levels that trigger the District's criteria for chemical control – based on the mosquito's abundance, density, species composition, proximity to human settlements, water temperature, presence of predators, and other factors – District staff will apply pesticides to the site in strict accordance with the pesticide label instructions and any applicable federal and state requirements. All of the chemical tools the District uses are evaluated in Appendix B, Ecological and Human Health Risk Assessment.

The vast majority of chemical control tools are used for mosquito abatement. The primary pesticides used can be divided between "larvicides," which are specifically toxic to mosquito and other insect larvae, and "adulticides," which are used to control adult mosquito populations. Larvicides are applied when the chemical control criteria for mosquito larvae are present and application rates vary according to time of year, water temperature, the level of organic content in the water, the type of mosquito species present, larval density, and other variables. Larvicide applications may be repeated at any site at recurrence intervals ranging from annually to weekly. In addition to chemical control of mosquito larvae, the District may use pesticides for control of adult mosquitoes when no other tools are available and if specific criteria are met, including species composition, population density (as measured by landing count or other quantitative method), proximity to human populations, and/or human disease risk. As with larvicides, adulticides are applied in strict conformance with label directions and applicable federal and state requirements. Adulticiding is the only known effective measure of reducing an adult mosquito population in a timely manner. All mosquito adulticiding activities would follow reasonable guidelines and District BMPs to avoid affecting nontarget species including bees. Timing of applications (when mosquitoes are most active), avoiding sensitive areas, working and coordinating efforts with California Department of Fish and Wildlife (CDFW) or United States Fish and Wildlife Service (USFWS), and following label instructions and any applicable federal and state requirements all result in effective mosquito control practices.

Besides using insecticides for mosquito populations, the District may selectively apply them to control ground-nesting yellow jackets. This activity would be carried out to protect employees when a nest occurs in a spot needed to access a mosquito source. The District excludes from its yellow jacket control program populations of this vector that are located in or on a structure. Yellow jacket nests that are off the ground would be treated under special circumstances to protect the health and safety of the District's employees.

S.5.2 Alternatives Eliminated From Further Consideration

These alternatives are identified and evaluated in the District's Alternatives Report (Appendix E) and summarized in Section 15.2 of this PEIR. In summary, the District determined that of the 19 potential tools, the following 8 methods were not immediately available or viable for use in its IMMP:

- **Biological Control (Viruses).** None of the mosquito viruses listed (in Appendix E, Section 2.5) are generally commercially available in California for mosquito control at present and there are currently many efficacy related issues.
- **Biological Control (Parasites).** None of the mosquito parasites listed (in Appendix E, Section 2.7) are generally available commercially in California for mosquito control at present. Research on the use of parasites for mosquito control has also shown several limitations related to efficacy. Although the use of parasites as a means for managing vector populations shows promise, much work concerning their biology, cultivation, mass production, transport, and release remains to be done.
- **Biological Control Plants (Carnivorous Plants).** Whether terrestrial or aquatic, carnivorous plants use a wide range of invertebrate prey and are not specific predators of mosquitoes. What little data exist indicates that carnivorous plants, especially terrestrial species, are inefficient for the control of mosquitoes and other invertebrate vectors.
- **Mass Trapping.** This tool is not considered by the District to be a practical, effective, reliable method of controlling mosquito populations. Operational difficulties exist in placing out and retrieving large numbers of traps, the least of which are the volume of traps required, numbers of staff, amount of staff time, access, and travel necessary for this tool to be effective. Mass trapping of mosquitoes has proven to be both costly and in most instances ineffective.
- **Attract and Kill.** This is not considered by the District to be a practical, effective, reliable, method of controlling mosquito populations. The technology is limited, and effectiveness is either not obtained or is inconsistent. Nontarget insects can be impacted. The District is aware of one commercially available attractive toxic sugar bait (ATSB) product, Terminix® AllClear ATSB Mosquito Bait Concentrate. The District still needs to operationally test this material, as well as other potential ATSBs, to determine those circumstances where their use may be effective while also having little or no nontarget species impacts.
- **Inundative Releases.** This tool is not considered by the District to be a practical or a currently feasible method of controlling mosquito populations. Genetically modified mosquitoes are still experimental. They are also not commercially available at this time. The use of any genetically altered organisms, even mosquitoes, may also not be acceptable to the public.
- **Regulatory Control.** This is not considered feasible because adoption of regulations is lengthy, time intensive, expensive and uncertain as to the regulatory outcome. This approach is not focused sufficiently on control of existing populations. Moreover, regulatory controls are dependent upon state and federal agencies to initiate and implement, and thus this approach cannot assure that any project objectives would be achieved. Additionally, regulatory actions have the potential to create as well as eliminate additional mosquito habitats.
- **Repellents.** Have no value as a control tool; they are strictly a personal protective measure. Although effective for small-scale use by humans and animals, they are not part of the overall Program control strategy because they merely displace the problem and do not reduce the mosquito population in an area.

S.5.3 Environmentally Superior Alternative

Table S-1 presents a summary of all of the impacts associated with each Program Alternative and, therefore, the overall Program of all of the alternatives combined. For Surveillance, Physical Control,

Vegetation Management, and Biological Control, the impacts are either “less than significant” (LS) or “no impact” (N). The Chemical Control Alternative has one potentially significant impact which can be mitigated to less than significant and one significant and unavoidable impact.

- The Chemical Control Alternative has significant and unavoidable impacts to surface water resources from the application of naled as a mosquito adulticide. Potential future applications of naled would be infrequent but potentially necessary to protect public health in areas where mosquito populations have developed resistance to pyrethroids.
- The Chemical Control Alternative could also subject people to objectionable odors. Impacts even with BMPs implemented could be **potentially significant but mitigable.** Certain VOCs emit characteristic odors when they evaporate (volatilize) into air, even at very low concentrations well within safety limits. Pesticides currently used or proposed for future emit phenols (e.g., lambda-cyhalothrin, deltamethrin, etofenprox, permethrin, resmethrin, or naled). Materials such as the adulticides pyrethrin and permethrin have an odor. Due to limited applicability, small quantities of these types of substances are typically used. The human sense of smell (olfactory system) is sensitive to these types of compounds as a warning mechanism, and some individuals are more sensitive than others. The Chemical Control Alternative would apply certain types of odorous treatments using hydraulic spraying and atomizing (fogging), which could result in drift of small droplets and gaseous vapors. Depending on atmospheric conditions (i.e., wind direction, wind speed, stability class), this drift could subject people to objectionable odors near a treatment area.

Section 15.4 describes two "Reduced Program Alternatives:" Reduced Chemical Control and No Chemical Control.

- **Reduced Chemical Control**: To the extent the District can modify elements of the Chemical Control Alternative to mitigate identified impacts by avoiding completely the potentially significant impacts associated with some pesticide products by using other, less odorous products, then the environmentally superior alternative would be a Program incorporating these modifications to this alternative as components of the overall IMMP. Excluding air quality and the odor issue, the impacts to all of the other resources would be the same as for the proposed Program. Since naled would only used when absolutely necessary to protect public health, there is no reduced chemical option.
- **No Chemical Control**: This alternative would completely remove the chemical treatment options under the Vegetation Management and Chemical Control Alternatives. It would not have any of the significant and unavoidable or less-than-significant impacts associated with herbicide and pesticide use. However, it was determined to be inconsistent with Program objectives and IMM principles, and it could lead to substantial impacts to human health due to the reduced effectiveness of the Program in controlling mosquito populations.

The No Program Alternative is not the environmentally superior alternative due to its potentially significant impacts to the following resources and concerns identified in Section 15.3: urban and rural land uses, aquatic and terrestrial biological resources, ecological health, human health, and public services and hazard response.

S.6 Summary of Environmental Impacts and Mitigation Measures

Table S-1 provides a summary of all of the environmental impacts and mitigation for the Program alternatives. The existing condition (2012) sets the baseline against which the alternatives are evaluated for CEQA. Impact statements are presented in their entirety in the resource sections. For Table S-1, impact areas or environmental concerns are merely listed using brief terms for ease of comparison. Symbols used in the table for CEQA determinations of impact are:

SU = Significant and Unavoidable Impact

SM = Potentially Significant but Mitigable Impact

LS = Less-than-Significant Impact

N = No Impact

na = Not Applicable

Table S-2 presents only the potentially significant impacts for the Program alternatives, the mitigation required, and the significance following mitigation implementation. The Program alternative with a potentially significant but mitigable impact is Chemical Control. Under the Chemical Control Alternative, potentially significant impacts to air quality exist from the potential for objectionable odors. Mitigation measures represent actions the District (or other agency) will take to reduce all of these impacts to a level of insignificance. If mitigation is not feasible or practical to implement, or simply not enough to reduce the impact to less than significant, then the impact is "significant and unavoidable." All of the potentially significant impacts associated with Program alternatives can be mitigated to a less-than-significant level with one exception.

One potentially significant and unavoidable impact is associated with the Chemical Control Alternative related to the potential use of naled for control of adult mosquitoes. Impact WR-25 states that due to the toxicity of its breakdown product but its importance in the District's IMMP, the application of naled is considered a potentially significant and unavoidable impact to surface and groundwater resources. Naled is an organophosphate insecticide and may be used in rotation with pyrethrins or pyrethroids to avoid the development of pesticide resistance. Naled is the most commonly used material for this purpose, but the District is not currently using it. Naled has low water solubility but is mobile in soils with low organic matter content. It is moderately toxic to mammals, fish, and aquatic invertebrates but degrades readily in water, under sunlight, in soil under aerobic and anaerobic conditions, in air, and on plants. Dichlorvos, a breakdown product of naled, and itself a registered pesticide, may be present in toxic concentrations after naled is no longer detectable. However, naled and other organophosphates are important chemicals that help prevent or control resistance to alternative products such as pyrethrins and pyrethroids by providing an alternative chemistry/mode of action.

Table S-1 Summary Comparison of Impacts of Alternatives

Environmental Concern	Surveillance	Physical Control	Vegetation Management	Biological Control	Chemical Control
3. Urban and Rural Land Uses					
Quantity and/or quality of recreational opportunities	LS	LS	LS	N	LS
Conflict with applicable land use regulations	N	N	N	N	N
4. Biological Resources – Aquatic					
Special status species	LS	LS	LS	N	LS
Sensitive natural community	LS	LS	LS	N	N
Federally protected wetlands	LS	LS	LS	N	N
Movement of native resident or migratory fish or wildlife species	N	N	N	N	N
Conflict with local policies and ordinances	N	N	N	N	N
Conflict with HCPs or NCCPs	N	N	N	N	N
5. Biological Resources – Terrestrial					
Special status species	LS	LS	LS	N	LS
Sensitive natural community	LS	LS	LS	N	N
Federally protected wetlands	LS	LS	LS	N	N
Movement of native resident or migratory fish or wildlife species	N	N	N	N	N
Conflict with local policies and ordinances	N	N	N	N	N
Conflict with HCPs or NCCPs	N	N	N	N	N
6. Ecological Health					
Impacts on nontarget ecological receptors	LS	LS	LS	LS	LS
7. Human Health					
Impacts on human health	N	LS	N for physical, LS for herbicides	N	N for some chemicals, LS for other chemicals (see Table 15-1)

Table S-1 Summary Comparison of Impacts of Alternatives

Environmental Concern	Surveillance	Physical Control	Vegetation Management	Biological Control	Chemical Control
8. Public Services and Hazard Response					
Increase demand for police, fire, or health-care services	N	N	N	N	N
Create a significant hazard to the public or the environment through routine transport, use, or disposal of hazardous materials or through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment	N	N	N	N	N
Expose people or structures to a significant risk of loss, injury, or death involving wildland fires	N	N	N	N	N
9. Water Resources					
Impacts on surface water resources	N	LS	LS	LS	LS except: SU for Naled
Impacts on groundwater resources	N	LS	LS	LS	LS except: SU for Naled
10. Air Quality					
Conflict with air quality plans	LS	LS	LS	LS	LS
Violate an ambient air quality standard	LS	LS	LS	LS	LS
Cumulatively considerable increase of nonattainment pollutants	LS	LS	LS	LS	LS
Expose sensitive receptors to substantial pollutant concentrations	LS	LS	LS	LS	LS
Subject people to objectionable odors	N	N	N	N	SM
11. Greenhouse Gases and Climate Change					
Cumulatively considerable amount of GHGs	LS	LS	LS	LS	LS
Conflict with applicable plans, policies, or regulations for reducing GHG emissions	LS	LS	LS	LS	LS
12. Noise					

Table S-1 Summary Comparison of Impacts of Alternatives

Environmental Concern	Surveillance	Physical Control	Vegetation Management	Biological Control	Chemical Control
Exceedance of noise standards	LS	LS	LS	LS	LS
Substantial temporary increase in noise	LS	LS	LS	LS	LS

Table S-2 Significant Impacts and Mitigation for Chemical Control Alternative

Affected Resource and Area of Potential Impact	Identified Impact	Mitigation Measures	Significance After Mitigation
10. Air Quality			
Objectionable Odors	**Impact AQ-25:** The Chemical Control Alternative could subject people to objectionable odors. Impacts could be **potentially significant but mitigable.**	**Mitigation Measure AQ-25a:** When possible, defer application of treatment compounds until such time that favorable wind conditions would reduce or avoid the risk of drift into populated areas. > Location: Areas to receive treatment with pesticides that are near residential and commercial land uses > Monitoring/Reporting Action: District staff to check current land use maps or aerial photos prior to treatments > Effectiveness Criteria: Document odor complaints from the public > Responsible Agency: District > Timing: Prior to chemical treatments **Mitigation Measure AQ-25b:** Use GPS dataloggers that document site-specific compliance with all label requirements for drift mitigation. > Location: Areas to receive treatment with pesticides that are near residential and commercial land uses > Monitoring/Reporting Action: District staff to check current land use maps or aerial photos prior to treatments > Effectiveness Criteria: Document odor complaints from the public > Responsible Agency: District > Timing: Prior to chemical treatments **Mitigation Measure AQ-25c:** Use precision application technology to reduce drift and the total amount of material applied. This measure can include (1) precision guidance systems that minimize ground or aerial spray overlap (e.g., GPS and Real Time	Less than significant

Table S-2 Significant Impacts and Mitigation for Chemical Control Alternative

Affected Resource and Area of Potential Impact	Identified Impact	Mitigation Measures	Significance After Mitigation
		Kinetics – GPS/RTK), and (2) computer-guided application systems that integrate real-time meteorological data and computer model guidance to reduce drift from aerial application (e.g., trade names "AIMMS," "Wingman™ GX," and "NextStar™ Flow Control"). > Location: Areas to receive treatment with pesticides that are near residential and commercial land uses > Monitoring/Reporting Action: District staff to check current land use maps or aerial photos prior to treatments > Effectiveness Criteria: Document odor complaints from the public > Responsible Agency: District > Timing: Prior to chemical treatments	