



# **SAN JOAQUIN COUNTY MOSQUITO & VECTOR CONTROL DISTRICT**

**MOSQUITO, VECTOR AND DISEASE CONTROL ASSESSMENT**

## **ENGINEER'S REPORT**

FISCAL YEAR 2018-19

JUNE 2018

PURSUANT TO THE GOVERNMENT CODE , HEALTH AND SAFETY CODE AND  
ARTICLE XIID OF THE CALIFORNIA CONSTITUTION

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## **SAN JOAQUIN COUNTY MOSQUITO AND VECTOR CONTROL DISTRICT**

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## TABLE OF CONTENTS

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<b>INTRODUCTION .....</b>	<b>1</b>
OVERVIEW .....	1
ASSESSMENT FORMATION AND CONTINUATION .....	1
ASSESSMENT OVERVIEW .....	2
LEGAL ANALYSIS .....	5
COMPLIANCE WITH CURRENT LAW .....	7
<b>GENERAL DESCRIPTION OF THE PROGRAM AND SERVICES .....</b>	<b>8</b>
ABOUT THE VECTOR CONTROL PROGRAM .....	8
HISTORY OF THE DISTRICT .....	8
DESCRIPTION OF VECTOR CONTROL PROGRAM .....	9
<b>VECTORS AND VECTORBORNE DISEASES IN THE DISTRICT .....</b>	<b>11</b>
MOSQUITOES .....	11
CULEX ERYTHROTHORAX.....	12
ECTOPARASITES.....	13
VENOMOUS ARTHROPODS.....	13
<b>INTEGRATED PEST MANAGEMENT .....</b>	<b>14</b>
MOSQUITOES .....	15
ECTOPARASITES.....	19
FILTH FLIES .....	19
VENOMOUS ARTHROPODS.....	20
RODENTS .....	20
<b>PUBLIC RELATIONS, OUTREACH, AND EDUCATION .....</b>	<b>21</b>
<b>INTERAGENCY PROGRAMS.....</b>	<b>22</b>
<b>RESEARCH AND TESTING.....</b>	<b>23</b>
<b>ESTIMATE OF COST.....</b>	<b>24</b>
<b>METHOD OF ASSESSMENT .....</b>	<b>26</b>
DISCUSSION OF BENEFIT.....	26
MOSQUITO AND VECTOR CONTROL IS A SPECIAL BENEFIT TO PROPERTIES .....	28
BENEFIT FACTORS.....	28
BENEFIT FINDING.....	35
GENERAL VS. SPECIAL BENEFIT .....	35
CALCULATING GENERAL BENEFIT .....	37
ZONES OF BENEFIT .....	40
METHOD OF ASSESSMENT.....	42
ASSESSMENT APPORTIONMENT .....	44
RESIDENTIAL PROPERTIES .....	44
COMMERCIAL/INDUSTRIAL PROPERTIES.....	46
AGRICULTURAL, RANGELAND, AND CEMETERY PROPERTIES .....	46

VACANT PROPERTIES ..... 47  
OTHER PROPERTIES ..... 47  
DURATION OF ASSESSMENT ..... 48  
APPEALS AND INTERPRETATION ..... 48  
**ASSESSMENT ..... 49**  
**ASSESSMENT DIAGRAM..... 52**  
**ASSESSMENT ROLL ..... 53**

**LIST OF FIGURES**

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FIGURE 1 – CURRENTLY IMPORTANT SPECIES IN THE DISTRICT..... 11

FIGURE 2 – COST ESTIMATE FOR FISCAL YEAR 2018-19 ..... 24

FIGURE 3 – RESIDENTIAL ASSESSMENT FACTORS..... 45

FIGURE 4 – COMMERCIAL/INDUSTRIAL BENEFIT ASSESSMENT FACTORS..... 47

FIGURE 5 – SUMMARY COST ESTIMATE FISCAL YEAR 2018-19 BUDGET ..... 49

## INTRODUCTION

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### OVERVIEW

The San Joaquin County Mosquito and Vector Control District (“District”) currently provides mosquito and vectorborne disease control services throughout San Joaquin County. The District has been providing its public health protection services in San Joaquin County for over 65 years.

The District was formed in 1945 at the request of homeowners and farmers who were being impacted by significant numbers of uncontrolled disease carrying and pest mosquitoes. Before the creation of the district, outdoor activities were restricted in many areas, prompting business owners and civic leaders to push for a comprehensive mosquito control program. Since that time, the District has significantly reduced overall mosquito populations and has increased the level of vectorborne disease surveillance and control.

The District’s services cover over 1,400 square miles and are provided to properties accommodating over 650,000 residents. The District is governed by a Board of Trustees, comprised of one member appointed by the city council of each of the incorporated cities within the County: Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton and Tracy; and four members appointed by the San Joaquin County Board of Supervisors. The assessment diagram on page 53 depicts the District’s service area.

The District’s core services are summarized as follows:

- Early detection of public health threats through comprehensive vector and disease surveillance.
- Elimination and control of mosquitoes and to diminish the nuisance and harm caused by mosquitoes.
- Reducing vectors or exposure to vectors that transmit diseases.
- Appropriate, timely response to requests to prevent/control mosquitoes, other vectors, and the diseases they can transmit.

### ASSESSMENT FORMATION AND CONTINUATION

In order to allow property owners to ultimately decide whether funding should be provided for the services summarized above, the Board authorized the initiation of proceedings for a benefit assessment in 2005. The assessment was named the Mosquito, Vector and Disease Control Assessment (the “Assessment Area”). In September and October of 2005, the District conducted an assessment ballot proceeding pursuant to the requirements of Article XIII D of the California Constitution (“The Taxpayer’s Right to Vote on Taxes Act”) and the Government Code. During this ballot proceeding, owners of property in the Assessment Area were provided with a notice and ballot for the special assessment. A 45-day period was provided for balloting and a public hearing was conducted on November 1, 2005.

After the conclusion of the public input portion of the public hearing, all valid received ballots were tabulated by Croce & Company, an independent accounting and auditing firm. At the continued public hearing on November 15, 2005, after the ballots were tabulated, it was determined that the assessment ballots submitted in opposition to the assessments did not exceed the assessment ballots submitted in favor of the assessments (with each ballot weighted by the proportional financial obligation of the property for which the ballot was submitted). The final balloting result was 71.41% weighted support from ballots returned.

As a result, the Board gained the authority to approve the levy of the assessments for fiscal year 2006-07 and to continue to levy in future years. The Board took action, by Resolution No. 05/06-5 passed on November 15, 2005, to approve the first year levy of the assessments for fiscal year 2006-07. The authority granted by the ballot proceeding was for a first year assessment rate of \$7.58 per single family home, increased each subsequent year by the San Francisco Area CPI (Consumer Price Index) not to exceed 3% per year.

This Engineer's Report ("Report") was prepared by SCI Consulting Group (SCI) to establish the estimated costs for the mosquito, disease surveillance and control services, supplies, equipment, facilities and related costs that will be funded by the assessments for fiscal year 2018-19, to determine the special benefits and general benefits received from the services and to apportion the assessments to lots and parcels within the District based on the estimated special benefit each parcel receives from the services funded by the benefit assessment.

In each subsequent year for which the assessments will be continued, the Board will publish in a local newspaper a legal notice of the intent to continue the assessments for the next fiscal year and the date when the Board will hold a public hearing. At the annual public hearing, members of the public can provide input to the Board prior to the Board's decision on continuing the services and assessments for the next fiscal year. The Board must approve at this meeting a budget for the upcoming fiscal year's costs and services, an updated annual Engineer's Report, and an updated assessment roll listing all parcels and their assessments for the upcoming fiscal year. After the conclusion of the public input portion of the hearing the Board may take action, by resolution, to approve the continuation of the assessments for fiscal year 2018-19.

If the Board approves this Engineer's Report and the assessments it establishes for fiscal year 2018-19, the assessments would be submitted to the County Auditor for inclusion on the property tax rolls for fiscal year 2018-19.

## **ASSESSMENT OVERVIEW**

The District provided a "baseline" level of mosquito, vector and disease control services in the County. The services that are now being provided to the Assessment Area and that are funded by the Assessment consist of expanded services, as listed below, above the existing baseline level of services currently provided. In absence of the Assessments, properties would not receive the improved services, so the Services are clearly over and above the

baseline, or level of mosquito, vector and disease control services that otherwise would be provided.

The following is an outline of the enhanced services, programs and related costs that are funded by the mosquito, vector and disease control assessment:

- Mosquito control and abatement
- Surveillance for vectorborne diseases
- Mosquito inspections
- Response to service requests
- Mosquitofish for backyard fish ponds and other appropriate habitats
- Presentations to schools and civic groups
- Mosquito surveillance and disease testing
- Upgrading of the facilities and equipment utilized by the District
- Tick surveillance and Lyme disease prevention services

The Assessment Area was narrowly drawn to include only properties that may request and/or receive direct and more frequent service, that are located within the scope of the vector surveillance area, that are located within flying or traveling distance of potential vector sources monitored by the District, and that benefit from a reduction in the amount of vectors reaching and impacting the property as a result of the enhanced vector surveillance and control. The Assessment Diagram included in this report shows the boundaries of the Assessment District.

As used within this Report and the benefit assessment ballot proceeding, the following terms are defined:

*“Vector” means 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, mites, ticks, other arthropods, and rodents and other vertebrates (Health and Safety Code Section 2002(k)).*

*“Vector Control” mean any system of public improvements or services that is intended to provide for the surveillance, prevention, abatement, and control of vectors as defined in subdivision (k) of Section 2002 of the Health and Safety Code and a pest as defined in Section 5006 of the Food and Agricultural Code (Government Code Section 53750(l)).*

The District operates under the authority of the Mosquito Abatement and Vector Control District Law of the State of California. Following are excerpts from the Mosquito Abatement and Vector Control District Law of 2002, codified in the Health and Safety Code, Section 2000, et. seq. which serve to summarize the State Legislature’s findings and intent with regard to mosquito abatement and other vector control services:

2001. (a) *The Legislature finds and declares all of the following:*

(1) *California's climate and topography support a wide diversity of biological organisms.*

(2) *Most of these organisms are beneficial, but some are vectors of human disease pathogens or directly cause other human diseases such as hypersensitivity, envenomization, and secondary infections.*

(3) *Some of these diseases, such as mosquitoborne viral encephalitis, can be fatal, especially in children and older individuals.*

(4) *California's connections to the wider national and international economies increase the transport of vectors and pathogens.*

(5) *Invasions of the United States by vectors such as the Asian tiger mosquito and by pathogens such as the West Nile virus underscore the vulnerability of humans to uncontrolled vectors and pathogens.*

(b) *The Legislature further finds and declares:*

(1) *Individual protection against the vectorborne diseases is only partially effective.*

(2) *Adequate protection of human health against vectorborne diseases is best achieved by organized public programs.*

(3) *The protection of Californians and their communities against the discomforts and economic effects of vectorborne diseases is an essential public service that is vital to public health, safety, and welfare.*

(4) *Since 1915, mosquito abatement and vector control districts have protected Californians and their communities against the threats of vectorborne diseases.*

(c) *In enacting this chapter, it is the intent of the Legislature to create and continue a broad statutory authority for a class of special districts with the power to conduct effective programs for the surveillance, prevention, abatement, and control of mosquitoes and other vectors.*

(d) *It is also the intent of the Legislature that mosquito abatement and vector control districts cooperate with other public agencies to protect the public health, safety, and welfare. Further, the Legislature encourages local communities and local officials to adapt the powers and procedures provided by this chapter to meet the diversity of their own local circumstances and responsibilities.*

Further the Health and Safety Code, Section 2082 specifically authorizes the creation of benefit assessments for vector control, as follows:

(a) *A district may levy special benefit assessments consistent with the requirements of Article XIID of the California Constitution to finance vector control projects and programs.*

This Engineer's Report ("Report") was prepared by SCI Consulting Group ("SCI") to describe the vector control services to be funded by the proposed assessment (the "Services"), to

establish the estimated costs for those Services, to determine the special benefits and general benefits received by property from the Services and to apportion the assessments to lots and parcels within the District based on the estimated special benefit each parcel receives from the Services funded by the benefit assessment.

## LEGAL ANALYSIS

### PROPOSITION 218

This assessment was formed consistent with Proposition 218, The Right to Vote on Taxes Act, which was approved by the voters of California on November 6, 1996, and is now Article XIII C and XIII D of the California Constitution. Proposition 218 provides for benefit assessments to be levied to fund the cost of providing services, improvements, as well as maintenance and operation expenses to a public improvement which benefits the assessed property.

Proposition 218 describes a number of important requirements, including a property-owner balloting, for the formation and continuation of assessments, and these requirements are satisfied by the process used to establish this assessment. When Proposition 218 was initially approved in 1996, it allowed for certain types of assessments to be “grandfathered” in, and these were exempted from the property-owner balloting requirement.

*Beginning July 1, 1997, all existing, new, or increased assessments shall comply with this article. Notwithstanding the foregoing, the following assessments existing on the effective date of this article shall be exempt from the procedures and approval process set forth in Section 4:*

*(a) Any assessment imposed exclusively to finance the capital costs or maintenance and operation expenses for sidewalks, streets, sewers, water, flood control, drainage systems or vector control.*

Vector control was specifically “grandfathered in,” underscoring the fact that the drafters of Proposition 218 and the voters who approved it were satisfied that funding for vector control is an appropriate use of benefit assessments, and therefore confers special benefit to property.

### **SILICON VALLEY TAXPAYERS ASSOCIATION, INC. v. SANTA CLARA COUNTY OPEN SPACE AUTHORITY**

In July of 2008, the California Supreme Court issued its ruling on the Silicon Valley Taxpayers Association, Inc. v. Santa Clara County Open Space Authority (“SVTA vs. SCCOSA”). This ruling is the most significant legal document in further legally clarifying Proposition 218. Several of the most important elements of the ruling included further emphasis that:

- Benefit assessments are for special benefit to property, not general benefits<sup>1</sup>
- The services and /or improvements funded by assessments must be clearly defined
- Special benefits are directly received by and provide a direct advantage to property in the assessment area

This Engineer's Report, and the process used to establish this assessment are consistent with the SVTA vs. SCCOSA decision. There have been a number of clarifications made to the analysis, findings and supporting text in this Report to ensure that this consistency is well communicated.

#### **DAHMS V. DOWNTOWN POMONA PROPERTY**

On June 8, 2009, the 4th Court of Appeal amended its original opinion upholding a benefit assessment for property in the downtown area of the City of Pomona. On July 22, 2009, the California Supreme Court denied review. On this date, Dahms became good law and binding precedent for assessments. In Dahms the court upheld an assessment that was 100% special benefit (i.e. 0% general benefit) on the rationale that the services and improvements funded by the assessments were directly provided to property in the assessment district. The Court also upheld discounts and exemptions from the assessment for certain properties.

#### **BONANDER V. TOWN OF TIBURON**

On December 31, 2009, the 1<sup>st</sup> District Court of Appeal overturned a benefit assessment approved by property owners to pay for placing overhead utility lines underground in an area of the Town of Tiburon. The Court invalidated the assessments on the grounds that the assessments had been apportioned to assessed property based in part on relative costs within sub-areas of the assessment district instead of proportional special benefits.

#### **BEUTZ V. COUNTY OF RIVERSIDE**

On May 26, 2010, the 4<sup>th</sup> District Court of Appeal issued a decision on the Steven Beutz v. County of Riverside ("Beutz") appeal. This decision overturned an assessment for park maintenance in Wildomar, California, primarily because the general benefits associated with improvements and services were not explicitly calculated, quantified and separated from the special benefits.

#### **GOLDEN HILL NEIGHBORHOOD ASSOCIATION V. CITY OF SAN DIEGO**

On September 22, 2011, the San Diego Court of Appeal issued a decision on the Golden Hill Neighborhood Association v. City of San Diego appeal. This decision overturned an assessment for street and landscaping maintenance in the Greater Golden Hill neighborhood of San Diego, California. The court described two primary reasons for its

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<sup>1</sup> Article XIII D, § 2, subdivision (d) of the California Constitution states defines "district" as "an area determined by an agency to contain all parcels which will receive a special benefit from the proposed public improvement or property-related service."

decision. First, like in Beutz, the court found the general benefits associated with services were not explicitly calculated, quantified and separated from the special benefits. Second, the court found that the City had failed to record the basis for the assessment on its own parcels.

### **COMPLIANCE WITH CURRENT LAW**

This Engineer's Report is consistent with the requirements of Article XIII C and XIII D of the California Constitution and with the SVTA decision because the Services to be funded are clearly defined; the Services are available to and will be directly provided to all benefiting property in the Assessment District; and the Services provide a direct advantage to property in the Assessment District that would not be received in absence of the Assessments.

This Engineer's Report is consistent with Dahms because, similar to the Downtown Pomona assessment validated in Dahms, the Services will be directly provided to property in the Assessment District. Moreover, while Dahms could be used as the basis for a finding of 0% general benefits, this Engineer's Report establishes a more conservative measure of general benefits.

The Engineer's Report is consistent with Bonander because the Assessments have been apportioned based on the overall cost of the Services and proportional special benefit to each property. Finally, the Assessments are consistent with Beutz and Greater Golden Hill because the general benefits have been explicitly calculated and quantified and excluded from the Assessments.

## GENERAL DESCRIPTION OF THE PROGRAM AND SERVICES

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### ABOUT THE VECTOR CONTROL PROGRAM

The San Joaquin County Mosquito and Vector Control District operates as a special government agency that protects people, wildlife and property by controlling and monitoring disease-carrying insects such as mosquitoes. In addition, the District regularly tests for diseases carried by mosquitoes and ticks, and educates the public about how to protect themselves from diseases transmitted by mosquitoes and ticks.

The District staff currently consists of 35 regular employees, including a Manager, Assistant Manager, Public Information Officer, Entomologist, Assistant Entomologist, Fish Facility Manager, Fish Hatchery Assistant, 3 Mosquito Control Supervisors, 19 Mosquito Control Technicians, 23 Vector Control Technicians, 2 laboratory technicians, 2 mechanics, and 2 Office Support Specialists. Temporary employees are hired on an as-needed basis, to the extent allowed by the District's limited financial resources. In addition to their scheduled duties, District technicians respond to service requests from the public for mosquitoes and vector control issues. Office staff handles many other requests at the time of initial contact.

The agency is governed by the District's Board of Trustees. The Board meetings are held at 1:00 p.m. on the third Tuesday of each month.

### HISTORY OF THE DISTRICT

The following text provides an historical overview to the District and mosquito and vector control services in San Joaquin County:

*The first attempts at modern mosquito control in San Joaquin County were traced to the early 1930's when officials of the San Joaquin Local Health District enlisted the aid of the Civilian Conservation Corps to clear brush along streams to reduce mosquito-producing stagnant water. Additionally, a 1934-newspaper article described how public works employees in the City of Manteca cleaned ditches and sprayed diesel oil on stagnant water to control mosquito larvae. Armed with information about mosquito-borne diseases such as malaria and encephalitis, and up-to-date control methods learned from World War II, northern county residents petitioned the San Joaquin County Board of Supervisors in 1945 to create a mosquito abatement district. By Board action, the Northern San Joaquin County Mosquito Abatement District was formed to provide comprehensive mosquito control for the City of Lodi and a large portion of unincorporated area north of Eight Mile Road. The San Joaquin Mosquito Abatement District was formed in 1955, encompassing the balance of the county and including Stockton, Manteca, Tracy, Escalon, and Ripon. These two districts operated independently until 1980, when by mutual consent of both Boards of Trustees, the Local Agency Formation Commission and the*

*Board of Supervisors, the districts consolidated to form the San Joaquin County Mosquito Abatement District.*

*Due to increased public concern for new insect-borne diseases such as Lyme disease, and the migration and introduction of vectors such as Africanized Honey Bees, the District expanded its mission in 1993 to include other insects of public health importance. Currently named the San Joaquin County Mosquito and Vector Control District, this independent special district provides comprehensive vector surveillance and control for the residents of San Joaquin County.<sup>2</sup>*

## **DESCRIPTION OF VECTOR CONTROL PROGRAM**

The assessment will provide funding for the continuation and enhancement of the projects, services and programs for surveillance, disease prevention, abatement, and control of vectors within the District boundaries. Such mosquito abatement, vector control and disease prevention projects and programs include, but are not limited to, source reduction, biological control, larvicide applications, adulticide applications, disease monitoring, public education, reporting, accountability, research and interagency cooperative activities, as well as capital costs, maintenance, and operation expenses (collectively “Services”). The cost of these Services also includes capital costs comprised of equipment, capital improvements and facilities and other incidental expenses necessary and incidental to the District’s mosquito and vector control program.

Following are the Services and resulting level of service for the Assessment Area. As previously noted, the District provides a baseline level of service in the County. These Services are over and above the current baseline level of service. The formula below describes the relationship between the final level of service, the existing baseline level of service, and the enhanced level of service to be funded by the assessment.

<b>Final Level of Service</b>	<b>=</b>	<b>Baseline Level of Service</b>	<b>+</b>	<b>Enhanced Level of Service</b>
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The Services are further defined as follows:

- Response to mosquito problems as well as other pestiferous or disease-carrying organisms on property in the District.
- Control of mosquito larvae on residential property, agricultural sources, ditches, drain lines, vaults, seasonally flooded ponds, horse troughs, wastewater treatment plants, under buildings, freshwater marshes, creeks, catch basins, and other sources on property in the District.

<sup>2</sup> . San Joaquin County Mosquito and Vector Control District, “2001-2002 Annual Report”, page 2

- Survey and data analysis of mosquito larvae populations to assess public health risks and allocate control efforts on property in the District.
- Monitoring of mosquito and other hematophagous dipteran populations using carbon dioxide-baited traps, resting boxes, New Jersey light traps, gravid traps, ovitraps, and other surveillance methods on property in the District.
- Monitoring for diseases carried and transmitted by mosquitoes and other arthropods on property in the District, such as Encephalitis, Malaria, Dog Heartworm, and West Nile virus.
- Deployment and testing of sentinel chicken flocks, testing of dead birds, dead squirrels, and mosquitoes for arboviruses and other diseases, and other disease surveillance methods to detect vector-borne diseases on property in the District.
- Testing of new insecticide materials and investigation of their efficacy.
- Cooperation with the local health department, the State Department of Public Health, State Universities, and other agencies to survey and identify arthropod-borne diseases such as Lyme disease, rickettsiosis, and Plague found in parks, on trails and other locations frequented by the public.
- Facilitation of testing and monitoring for diseases carried and transmitted by ticks on property in the District, such as Lyme disease, Rickettsiosis, Ehrlichiosis, Anaplasmosis, Rocky Mountain Spotted Fever, and Babesiosis.
- Monitoring and/or advice for controlling other nuisance and potentially hazardous organisms and vectors such as ticks, mites, and fleas on property in the District.
- Education of residents on property in the District about the risks of diseases carried by mosquitoes, ticks, and other disease vectors, and how to better protect themselves and their pets.
- Assisting State and universities in testing for Hantavirus, Arenavirus, Plague and other diseases carried by small mammal populations.
- Monitoring of new and emerging vectors such as the Asian Tiger Mosquito.
- Testing for and control of new and emerging pathogens such as West Nile virus and Rickettsiosis.
- Education programs on vectors and disease abatement at school, community, and civic group meetings in the District.
- Distribution of printed material and brochures that describe what residents, employees and property owners in the District can do to keep their homes and property free of mosquitoes and other vectors.

## VECTORS AND VECTORBORNE DISEASES IN THE DISTRICT

### MOSQUITOES

Mosquitoes generally occur where there is adequate vegetation for harborage and where water is standing and/or stagnant. Although these mosquitoes have seasonal cycles, they tend to reproduce continuously while conditions are suitable.

FIGURE 1 – CURRENTLY IMPORTANT SPECIES IN THE DISTRICT

SPECIES	HABITAT	ABUNDANCE	SEASON	DISEASE ASSOCIATIONS
<i>Culex tarsalis</i>	Many	Great	Spring, Summer, Fall	West Nile virus, St. Louis encephalitis, Western equine encephalitis
<i>Culex pipiens</i>	Many	Great	Spring, Summer, Fall	West Nile virus, St. Louis encephalitis
<i>Culiseta incidens</i>	Many	Moderate	Winter, Spring, Fall	None, serious pest in urban/suburban areas
<i>Culiseta inornata</i>	Many	Moderate	Winter, Spring, Fall	None, serious pest in urban/suburban areas
<i>Anopheles freeborni</i>	Creeks, rice fields, lakes, wetlands	Moderate	Summer, Fall	Malaria
<i>Anopheles punctipennis</i>	Creeks, lakes	Moderate	Summer, Fall	Malaria
<i>Aedes sierrensis</i>	Oak tree holes, walnut orchards	Moderate	Late winter, Spring	Canine heartworm, serious pest in urban/suburban areas
<i>Aedes melanimon</i>	Pastures, wetlands	Moderate	Spring, Summer, Fall	Western equine encephalitis, serious pest
<i>Aedes nigromaculis</i>	Pastures, irrigated crops	Moderate	Spring, Summer, Fall	None, serious pest species in agricultural areas
<i>Aedes washinoi</i>	Fresh floodwater sites	Moderate	Winter, Spring	none
<i>Aedes vexans</i>	Fresh floodwater sites	Moderate	Summer	None, serious pest in recreational areas

## CULEX ERYTHROTHORAX

The *Culex erythrothorax* has become an important mosquito in the District. It is associated with large emergent vegetation in fresh water (e.g., tules), but is abundant in only limited areas of San Joaquin County. It is a strong vector of West Nile virus and an avid human biter.

Mosquitoes that lay their eggs in damp soil that might be flooded up to two years later occupy floodwater habitats. Once the area floods, most of the eggs hatch, producing a large number of mosquitoes for a short period of time. San Joaquin County has two floodwater species of concern. Floodwater mosquitoes prefer to bite in the evening, but they also bite during the day. One species, *Aedes washinoi* has only one generation annually, spending most of the year as eggs. *Aedes vexans* has multiple generations, but its numbers are restricted by the lack of rainfall during the warm part of the season when it occurs.

*Aedes* are major pests in the Central Valley of California and can potentially take advantage of changing conditions in San Joaquin County. *Aedes nigromaculis* is abundant in parts of the District, associated with irrigated pastures. It can have many generations per year, can travel long distances, and is an aggressive hard-biting pest species.

Outdoor containers that hold standing water are another common mosquito habitat in San Joaquin County. Containers can range from naturally occurring holes in trees, to discarded tires, swimming pools, ornamental ponds, bird baths, discarded cans, crumpled plastic and plugged rain gutters. Both *Culex pipiens* and *Culiseta incidens* commonly occur in containers other than tree holes. The tree hole-breeders are characterized by day-biting activity, bright markings, and deposition of eggs above the water line in the container. The District's only native tree-hole mosquito, *Aedes sierrensis*, normally hatches only one generation per year. It can reach great abundance locally but it does not fly far. *Aedes sierrensis* is commonly considered the District's most important vector of dog heartworm. *Aedes albopictus* and *Aedes aegypti* are two potentially important container breeders that could get introduced into San Joaquin County. Historically these types of mosquitoes have been introduced to many other areas of the U.S. through transportation associated with international commerce. *Aedes albopictus* was detected in San Joaquin County in a shipment of ornamental plants exported from a Pacific-rim country, but was eliminated prior to distribution of the plants. *Aedes albopictus* is an important species because it reaches great abundance, bites during the day, and reproduces continuously in containers often associated with human habitations. *Aedes aegypti* has similar habits, but has the additional drawback of being a powerful virus vector, specifically, dengue and yellow fever.

Mosquito-transmitted diseases in the District's area are caused by either viruses or the protozoan parasite of malaria (*Plasmodium falciparum* or *Plasmodium vivax*). The District has historically had sporadic detections of common California viruses like Western equine encephalitis and St. Louis encephalitis, but West Nile virus was abundant in wild birds, sentinel chicken flocks, mosquito pools, horses, and humans during the period 2004 through 2006. Malaria does not circulate in California at this time, but it used to be a major health problem. Trappers, miners and other immigrants introduced malaria into California in the

1800s from areas where malaria was common. Effective mosquito control and drugs to cure malaria in humans led to the eradication of malaria in California in the 1950s. Consistent reintroduction in humans from overseas creates a constant threat from malaria. In addition, some strains of malaria found in the world today are resistant to drugs that helped to eradicate the disease in the 1950s. The mosquitoes that can spread malaria are still abundant in the District and are capable of redistributing this serious health threat if it should somehow be reintroduced to San Joaquin County.

The diseases of most concern are: western equine encephalitis (WEE), St. Louis encephalitis (SLE), West Nile virus (WNV), and malaria, which are all transmitted by mosquitoes and the tick-borne diseases of Lyme disease and tularemia. Among the principal threats to which the San Joaquin County Mosquito and Vector Control District responds are:

- Human and animal diseases associated with mosquitoes
- Annoyance and economic disruption caused by mosquitoes
- Injury to humans from venomous arthropods
- Human diseases associated with wildlife

## **ECTOPARASITES**

San Joaquin County Mosquito and Vector Control District has the full range of ectoparasites that commonly affect humans. The most common are ticks, fleas, bed bugs, lice, scabies mites, and rat mites. Control of ectoparasites other than mosquitoes by the District is limited to surveillance and testing of ticks, and the distribution of public information on their prevention and control. *Dermacentor occidentalis* and *Ixodes pacificus* are the two most abundant species of ticks in San Joaquin County. *Dermacentor* adults are reported a little later in the year, but both are most commonly found in human-use areas in the cooler part of the year. The Lyme disease bacteria (*Borrelia burgdorferi*, associated with *Ixodes pacificus*) is the most important tick-transmitted pathogen, though there are very few cases of Lyme disease documented in the County each year. Potentially, *Ixodes pacificus* could transmit one of the ehrlichial pathogens (causing human granulocytic ehrlichiosis or human monocytic ehrlichiosis) and *Dermacentor occidentalis* could transmit the agent causing Rocky Mountain spotted fever (*Rickettsia rickettsii*).

## **VENOMOUS ARTHROPODS**

The Africanized honeybee (AHB) is an important stinging insect that is currently increasing its range within California. However, the arrival of AHB in California has led to serious health and safety problems for the public and raised the level of concern about all honeybees. Since there is a significant apiary industry in and near the District, this pest is of serious concern to the District and its residents.

## INTEGRATED PEST MANAGEMENT

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As noted, the District's services address several types of vectors and share general principles and policies. These include the identification of vector problems; responsive actions to control existing populations of vectors, prevention of new sources of vectors from developing, and the management of habitat in order to minimize vector production; education of land-owners and others on measures to minimize vector production or interaction with vectors; and provision and administration of funding and institutional support necessary to accomplish these goals.

In order to accomplish effective and environmentally sound vector management, the manipulation and control of vectors must be based on careful surveillance of their abundance, habitat (potential abundance), pathogen load, and/or potential contact with people; the establishment of treatment criteria (thresholds); and appropriate selection from a wide range of control methods. This dynamic combination of surveillance, treatment criteria, and use of multiple control activities in a coordinated program is generally known as Integrated Pest Management (IPM) (Glass 1975, Davis et al 1979, Borror et al 1981, Durso 1996, Robinson 1996).

San Joaquin County Mosquito and Vector Control District's Vector Management Program, like any other IPM program, by definition involves procedures for minimizing potential environmental impacts. The District employs IPM principles by first determining the species and abundance of vectors through evaluation of public service requests and field surveys and trapping of immature and adult pest populations; and then, if the populations exceed predetermined criteria, using the most efficient, effective, and environmentally sensitive means of control. For all vector species, public education is an important control strategy, and for some vectors (venomous insects, and non-mosquito arthropod ectoparasites) it is the District's primary control method. In appropriate situations, water management or other physical control activities (historically known as "source reduction" or "physical control") can be instituted to reduce vector-breeding sites. The District also uses biological control such as the planting of mosquitofish (in ornamental ponds, unused swimming pools and other standing water bodies). When these approaches are not effective or are otherwise inappropriate, natural materials that have been found to be environmentally safe are used to treat specific pest-producing or pest-harboring areas.

The District is organized into three principle sections to accomplish IPM. First, the headquarters element provides leadership, expertise, public relations/education, and interface with other governmental authorities.

Second, the operational section includes technicians who perform IPM in the field. Each technician is assigned an area of operation, with the technician responsible for control activities in his or her area. The technician has considerable autonomy in performing duties and therefore benefits from information on risk assessment through continuing education and direct communication from the District's professional staff. Technicians also perform

surveillance functions by responding to complaints from individual residents and by extensive examination of aquatic sites for mosquito larvae. Technicians also monitor their areas to be sure that their control efforts have been successful.

Finally, a surveillance and science section provides authoritative risk assessment; supplements surveillance performed by technicians, interacts with local government agencies for long-term reduction of vector sources, and performs operational research in support of IPM.

The District maintains the capability of applying aerosolized insecticide for area treatment of adult mosquitoes. This method is used to abate severe pest problems caused by active adult mosquitoes within the District, to quickly reduce significant populations of adult mosquitoes and to prevent or to reduce the spread of mosquito-borne disease in the environment. The District uses only products that have been deemed safe, approved and labeled by the U.S. Environmental Protection Agency for this purpose. Applications are made by personnel licensed by the California Department of Health Services and trained in the proper use of the products and specialized equipment used for this type of public health pest control; additionally, the District uses private contractors licensed by the California Department of Pesticide Regulation to perform aerial application of mosquito control materials. The following is a summary of the San Joaquin County Mosquito and Vector Control District's efforts to apply IPM to the vectors and issues outlined above.

## **MOSQUITOES**

### **PERMANENT WATER MOSQUITOES.**

**Risk assessment:** Historically, *Culex tarsalis* and *Culex pipiens* have been very abundant in San Joaquin County. The great disease transmission potential of these species documented in this and other parts of the state suggests that they are the principal vector mosquito species within the District. *Anopheles* spp. mosquitoes have persisted as a problem in standing water isolations in rice fields, wetlands, along the banks and on islands of rivers, in seepage areas and algae mats along canals, and along a large number of major drainages that provide persistent areas of standing water within the District. The threat of *Anopheles* as vectors is reduced by the absence of resident malaria pathogens in the area, but they remain an important pest species in this area. *Culiseta*, particularly *Culiseta incidens* and *Culiseta inornata*, are very widespread in the District, occurring in many kinds of habitats during most of the year. However, tests of their ability to transmit viral pathogens show them to be of little significance as vectors.

**Surveillance:** Surveillance of these mosquitoes is accomplished by a combination of methods. First, technicians and surveillance staff actively examine potential sites by sampling water, collecting larvae, and identifying the larvae to species. Second, various traps (light traps, carbon dioxide baited traps, foul water traps to attract ovipositing females) are used to collect adult mosquitoes or the eggs they deposit. The adults are collected daily and are subsequently classified and identified to species. Finally, individual residents and property owners call the District with complaints about mosquito bites or to report standing water and potential larval sites.

During the warm months, additional temporary staff may be hired to help assist with surveillance and control projects, such as adult mosquito collections, sentinel chicken testing, mosquito fish rearing and dissemination, and public education/outreach. The District's 19 full-time mosquito control technicians routinely inspect and treat thousands of identified and mapped residential, agricultural, industrial and natural standing water sources known to produce mosquitoes within the District. These sources need to be monitored every week to ten days for the presence of standing water and mosquito larvae. One type of standing water of particular concern to the District is runoff held in catch basins throughout the District, particularly in the urbanized areas. Catch basins can produce *Culex pipiens* in great numbers at locations close to residences and businesses. In rural areas of the District, standing water in rice fields, wetlands, and other man-made sources produce *Culex tarsalis* in great numbers. This species is capable of flying long distances and is considered the primary vector of West Nile virus in San Joaquin County and the Central Valley.

Viruses transmitted by permanent water mosquitoes are surveyed by testing the mosquito vectors, the avian reservoirs, horses and humans. West Nile virus can be detected in the District's laboratory by using a commercial strip immunoassay and rapid assay instrument. San Joaquin County Public Health Services, the California Department of Public Health, the California Department of Food and Agriculture, and the University of California perform other viral tests of mosquitoes, birds, or mammals. The District has participated in the statewide dead bird surveillance program for West Nile virus, responding to reports of dead birds from the public. These results are mapped using a Geographic Information System. Various county, State and private laboratories throughout California and elsewhere test humans and horses for WNV. The California Department of Health Services tries to obtain and compile human and horse test results from all testing facilities and report them to the appropriate local mosquito control agencies.

Cases of imported malaria are reported by San Joaquin County Public Health Services directly to the District. District laboratory staff and mosquito control technicians go to the address of the patients and check for *Anopheles* sources within a one-mile radius.

**Control:** The District currently uses several techniques to control permanent-water mosquito larvae, including biological, chemical, and physical control. Chemical control agents include the toxin of the natural bacteria *Bacillus thuringiensis israelensis* (Bti), which can be applied as either a liquid or a granule. This toxin must be eaten by larvae, restricting its use to the first through third instar stages of development. Bti has the tremendous advantage of specificity, only affecting mosquitoes and related groups of flies. The spores of *Bacillus sphaericus* (Bs) are also available for liquid spray or granular application. This product has the advantage over Bti of sometimes reproducing in the water, extending the life of its effectiveness. Bs is only effective against *Culex* and works well in highly polluted water. Methoprene is an analogue of a natural insect hormone that prevents successful development of larvae. It is available as a short-lived liquid and longer-acting granules and briquets. Finally, the District uses a short life-cycle oil combined with surfactants (Golden Bear) in situations where the materials above will not work. Golden Bear is the only material

available that is effective against pupae. Additional chemical control materials include dimilin and temephos.

The District uses the mosquito fish, *Gambusia affinis*, for biological control. These mosquito-eating fish work particularly well during warm months in decorative ponds, unused swimming pools, animal watering troughs, and a variety of other permanent, natural or artificial sources of standing water (e.g. rice fields, wetlands). The District maintains a 13-acre comprehensive aquaculture facility at the City of Lodi White Slough Water Treatment Facility. This facility and other mosquitofish culture sites annually produce over 3,000 pounds of mosquito fish. (When needed, mosquito fish can be used in combination with Bti, Bs, and methoprene in most larval sources.)

The District uses physical control as required; its application can temporarily or permanently alter habitats so that they do not produce mosquitoes. Examples of physical control include clearing vegetation around pond or stream banks, improving drainage, and providing access for other types of control work. Other efforts to design civil infrastructure in ways to exclude mosquitoes include interactions with local area developers and the planning departments of individual cities, and the San Joaquin County Planning Department.

Monitoring: For the most part, monitoring is the continuation of surveillance activities. Mosquito control technicians and laboratory staffs specifically check treatment sites to be sure that applications were successful. The surveillance section operates carbon dioxide baited traps, light traps and traps baited with foul-water to evaluate the success of the program.

### **FLOODWATER MOSQUITOES**

Freshwater floodwater species are an intermittent major pest and potential disease vector problem in San Joaquin County when faulty irrigation practices or wetland flood-up cause sudden increases in the numbers of *Aedes nigromaculis* and *Aedes melanimon*. These species as well as *Aedes vexans* mosquitoes will frequently create pest and potential disease vector problems when their populations rise due to intermittently flooded areas. These releases are manipulated by the U.S. Bureau of Reclamation for flood control, water quality control, and distribution of water for residential, industrial and agricultural purposes within the Central Valley Project (federal water management program for California). The vector potential of all of these species is low in San Joaquin County, though the isolation of West Nile virus from a mosquito identified as *Aedes squaminger* in San Luis Obispo raises some concern about the potential for spread of this disease by floodwater mosquito species not normally thought of as vectors.

Monitoring: *Aedes melanimon*, *Aedes nigromaculis*, and *Aedes vexans* are aggressive day-and night-time biters. As a result, public complaints are helpful in pinpointing intermittently flooded areas where these mosquitoes breed. Calls from the public are also used to help the District to help assess success or failure of treatments. However, daily monitoring of water releases from local reservoirs and inspections in the field of intermittently flooded areas known to create mosquito habitat are the primary means used by the District to

determine the need for treatment and to assess the effectiveness of treatments performed by District personnel to control floodwater mosquito species. Carbon dioxide baited traps are also an effective means of monitoring the adults of these species.

### **CONTAINER-BREEDING MOSQUITOES**

**Risk assessment:** The tree-hole breeding mosquito, *Aedes sierrensis*, can be a significant nuisance. Although most emerge in the late winter and spring, many adults survive into early summer. This species generally only travels short distances, with the advantage that neighbors are unlikely to be affected but with the disadvantage that residents with larval sites are likely to have an intense problem. The species is an important vector of dog heartworm, of which numerous cases were reported by local veterinarians in 2008. *Aedes albopictus* has been found in San Joaquin County and was eradicated, but continues to be found in other areas of California. This Asian species could be a significant problem in San Joaquin County because it would probably spread to many neighborhoods, reproduce throughout the warm season, and create a nuisance day-biting problem that currently does not exist. Although unlikely, *Aedes albopictus* could also support transmission of dengue virus, were that pathogen introduced.

**Surveillance:** The District monitors larval activity in tree holes to determine the stage of development and percentage of *Aedes sierrensis* emergence throughout the District. Complaints from residents in the early spring are another important means of determining areas with a high level of *Aedes sierrensis* activity. The District pays special attention to likely sources of *Aedes albopictus* importation (e.g., importers of lucky bamboo plants). *Aedes albopictus* is not highly attracted to carbon dioxide baited traps. The best ways to monitor are the use of black cups attractive to ovipositing females (eggs are counted on strips of paper in the cups), landing collections on humans, and inspection of container larval sites. Informing the public to look for day-biting, black and white mosquitoes is also effective.

**Control:** Due to the enormous number of tree holes in the District, larval control of the tree hole-breeding mosquito, *Aedes sierrensis*, by District personnel is only feasible in certain accessible areas, including public parks, landscaped street margins, and other public areas. Through its public education efforts the District encourages residents to eliminate breeding sites by filling tree holes with materials to displace the water in which these mosquitoes breed. When larval surveillance of tree holes indicates that a majority of the *Aedes sierrensis* mosquitoes have hatched out, adult mosquito control products are applied to areas of known *Aedes sierrensis* activity to quickly drop the populations of these mosquitoes back below significant pest thresholds. The combination of denying oviposition sites to females, larviciding certain tree hole areas, and reduction of the adult mosquito population by adulticiding is helpful in reducing levels of local infestation.

**Monitoring:** Surveillance for *Aedes sierrensis* continues on an annual basis.

The District has found mosquito and other potential vector sources scattered throughout the District. All properties within the District are within mosquito-flying range of one or more mosquito sources, and/or the normal travel range of one or more other vectors. Furthermore,

the District area has long suffered from mosquitoes and other vectors and includes a large number of sources.

Surveillance is conducted in a manner based upon an equal spread of resources throughout the District boundaries, focusing on areas of likely sources. Treatment strategies are based upon the results of the surveillance program, and are specifically designed for individual area.

## **ECTOPARASITES**

**Threat assessment:** The complex of ectoparasites creates an important segment of requests for prevention and control information from the public. Associations between non-mosquito ectoparasites and human disease in or near San Joaquin County are quite rare. Head lice, fleas associated with native rodents and domestic animals, and bedbugs are common in the District, but infestations are usually handled with limited advice from the District. Ticks are most noticeable in the fall, winter, and spring and create a low risk of Lyme disease and Rocky Mountain spotted fever. Residents usually encounter ticks when hiking in county or state parks, though some residences in the District have tick infestations in their yards.

**Surveillance:** The District does not currently perform any routine surveillance for any invertebrate ectoparasites, other than mosquitoes and ticks. Ectoparasite specimens brought to the District by the public are identified and tested for vectorborne diseases by the District's laboratory staff, or referred to other specialists.

**Control:** The District does not perform any control activities for ectoparasites except advice, surveillance, disease testing and education at this time.

## **FILTH FLIES**

**Threat assessment:** Associations between filth flies and human disease in or near the District are quite rare. Significant infestations of filth flies are invariably the result of agricultural, commercial, and residential activity in San Joaquin County. As a result, the source of flies can be very persistent. Flies transmit a number of pathogens by simply carrying them from place to place. The damage to human health is often in the form of increased rates of diarrhea where flies are abundant. Since diarrhea rates are not reported, complaints about flies are more commonly based on aesthetics.

**Surveillance:** The District does not actively survey areas for flies, but assists San Joaquin County Environmental Health Department with surveillance and control at site-specific locations; it is assumed the District will continue in this capacity in the future.

**Control:** The District does not perform routine control activities. Advice is given on sanitation, exclusion, and insecticidal treatment in coordination with that provided by San Joaquin County Environmental Health Department.

## VENOMOUS ARTHROPODS

**Threat assessment:** The Africanized honeybee (AHB) will probably cause significant stinging incidents if it arrives in the District. The actual threat from other venomous arthropods in the District is limited.

**Surveillance:** District personnel evaluate specific bee problems occurring on public lands. Honeybees are collected for morphometric evaluation of whether or not they are AHB.

**Control:** The District provides information to residents on the control of yellow jackets, AHB, and other stinging pests.

## RODENTS

**Threat assessment:** The temperate climate in San Joaquin County creates ideal conditions for commensal rodents. However, associations between rodents and human disease in or near San Joaquin County are quite rare. Roof rats are especially abundant, sometimes adopting a lifestyle similar to tree squirrels. Native rodents are commonly peridomestic or, in the case of wood rats, domestic. Rodents cause extensive damage to structures and harbor important human pathogens.

**Surveillance:** The District does not currently perform routine surveillance for rodents. The District does receive complaints regarding rodents and forwards the complaint to San Joaquin County Environmental Health Department.

**Control:** The District does not routinely apply rodenticides. Private pest control companies within and near the District provide rodent control services; therefore the District does not provide such services. The District provides written and verbal information on the control of rodents that may affect the health of local residents. The strategy proposed by the District is exclusion of rodents through rodent proofing the house, sanitation, elimination of outdoor sources of rodents (e.g., ivy), and decimation of the rodents through trapping

The District's objective is to provide the properties a District-wide level of consistent mosquito and vector control such that all properties would benefit from equivalent reduced levels of mosquitoes and other vectors. Surveillance and monitoring are provided on a District-wide basis. The District, though, cannot predict where control measures will be applied because the type and location of control depends on the surveillance and monitoring results. However, the control thresholds and objectives are comparable throughout the District.

The District responds to service requests within its boundaries. Any property owner, business or resident in the District may contact the District to request vector control related service or inspection and a District field technician will respond promptly to evaluate the property and situation and to perform appropriate surveillance and control services. The District responds to all service requests in a timely manner, regardless of location, within its boundaries.

## **PUBLIC RELATIONS, OUTREACH, AND EDUCATION**

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District staff conducts annual public relations, outreach, and education campaigns. This includes making press releases, publishing brochures, responding to requests for interviews from all media, informing other government agencies, and giving presentations. The District has an elementary school program whereby the District visits classrooms to present information about mosquito and vector biology and control issues, as well as personal protection, and techniques used by the District to control pests of public health importance. The recent emergence of West Nile Virus created a need for regular and fairly extensive media contacts, outreach and education.

San Joaquin County Mosquito and Vector Control District also interacts professionally at many levels. Personnel and the Board of Trustees attend meetings of the Mosquito and Vector Control Association of California and the American Mosquito Control Association.

## INTERAGENCY PROGRAMS

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San Joaquin County Mosquito and Vector Control District actively seeks cooperative exchanges with a wide range of other government agencies at county, state, and national levels. Among the relationships are

- a. San Joaquin County Public Health Services – Data sharing for threat assessment, testing of dead bird and mosquito pool samples, and public health education and outreach
- b. San Joaquin County Environmental Health Department– Waste tire disposal (a significant mosquito breeding source), dairy and poultry vector control, WNV task force participation
- c. San Joaquin County Department of Agriculture, Weights and Measures – Pesticide use monitoring and law enforcement, equine WNV education and outreach
- d. Code Enforcement of individual cities – Enforcement of sanitation and structural changes
- e. City/County/State Public Works Department – Storm drain treatment for the cities of Escalon, Lathrop, Lodi, Manteca, Ripon, Stockton, and Tracy, San Joaquin County, and State of California
- f. California Department of Public Health– Laboratory support, interaction with other districts, collation of data, licensing technicians
- g. US Fish and Wildlife Service – Wetland treatment
- h. US Army Corps of Engineers – Project development
- i. California Department of Fish and Game – Wetland development

## RESEARCH AND TESTING

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The District cooperates with University of California researchers to perform special research projects as opportunity allows and need dictates. These projects relate directly to operational problems so that the results enhance protection of health and property. Examples include collection of *Culex pipiens* mosquito larvae for laboratory study, exploration of mosquito immunity to various treatment products, and measurement of the flight range of *Culex tarsalis*.

## ESTIMATE OF COST

FIGURE 2 – COST ESTIMATE FOR FISCAL YEAR 2018-19

San Joaquin County Mosquito and Vector Control District Mosquito, Vector and Disease Control Assessment Estimate of Cost Fiscal Year 2018-19			<i>Total Budget</i>
Vector Control Services and Related Expenditures			
<b>Vector Control and Disease Prevention Operations</b>			<b>\$5,353,764</b>
Salaries and wages	\$2,761,683.00		
Employment benefits	\$2,592,081.00		
<b>Materials, Utilities and Supplies</b>			<b>\$2,956,860</b>
Materials	\$1,526,000.00		
General utilities and supplies	\$1,430,860.00		
<b>Capital Equipment and Fixed Assets</b>			<b>\$862,550</b>
Capital outlays	\$825,000.00		
Other expenditures	\$37,550.00		
Subtotal Vector Control Services and Related Expenditures			<b>\$9,173,174</b>
Additional Expenditures			
Allowance for Uncollectable Assessments			\$4,365
County Collection, Levy Administration, and Other Incidentals			\$44,016
Subtotal Additional Expenditures			<b>\$48,381</b>
<b>Total Benefit of Services and Related Expenses</b>			<b>\$9,221,555</b>
SFE Units			230058.24
<b>Benefit received per Single Family Equivalent Unit</b>			<b>\$40.08</b>
Less:			
District Contribution for General Benefits			(\$922,156)
District Contribution toward Special Benefits			(\$6,234,078)
Transfers to (from) reserves			(\$11,676)
Revenue from Other Sources			(\$7,167,910)
Net Cost of Vector Control, Fixed Asset Equipment, Operation			<b>\$2,053,645</b>
<b>Total Mosquito, Vector &amp; Disease Control Services and Incidentals</b> (Net Amount to be Assessed)			<b>\$2,053,645</b>
Budget Allocation to Property			
	Total SFE Units	Assessment per SFE	Total Assessment
Zone A	185,160.45	\$8.84	\$1,636,818
Zone B	307.40	\$8.40	\$2,582
Zone C	44,590.40	\$9.29	\$414,245
<b>Totals</b>	<b>230,058.24</b>		<b>\$2,053,645</b>

**Notes:**

As determined in the following section, at least 10% of the cost of the Services must be funded from sources other than the assessments to cover any general benefits from the Services. Therefore, out of the total cost of Services of \$8,724,341 the District must contribute at least \$872,434 from sources other than the assessments. The District will contribute over \$7,156,234, which is well over the estimated general benefits.

Includes allowance for uncollectable assessments from assessments on public agency parcels, county collection charges and assessment administration costs

SFE Units means Single Family Equivalent Benefit Units. See method of assessment in the following Section for further definition.

The assessment rate per SFE is the total amount to assessment per single family equivalent benefit unit.

The proceeds from the assessments will be deposited into a special fund for the Assessment. Funds raised by the assessment shall be used only for the purposes stated within this Report. Any balance remaining at the end of the fiscal year, June 30, must be carried over to the next fiscal year.

## METHOD OF ASSESSMENT

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This section of the Report explains the benefits to be derived from the Services provided for property in the District, and the methodology used to apportion the total assessment to properties within the Mosquito, Vector and Disease Control Assessment area.

The Mosquito, Vector and Disease Control Assessment area consists of all Assessor Parcels in San Joaquin County as defined by the State Board of Equalization tax rate areas and the San Joaquin County Assessor.

The method used for apportioning the assessment is based upon the proportional special benefits to be derived by the properties in the District over and above general benefits conferred on real property in the Assessment Area. Special benefit is calculated for each parcel in the Assessment Area using the following process:

1. Identification of total benefit to the properties derived from the Services
2. Calculation of the proportion of these benefits that are special vs. general
3. Determination of the relative special benefit within different areas within the Assessment Area
4. Determination of the relative special benefit per property type and property characteristic
5. Calculation of the specific assessment for each individual parcel based upon special vs. general benefit; location, property type and property characteristics

### DISCUSSION OF BENEFIT

In summary, the assessments can only be levied based on the special benefit to property. This special benefit is received by property over and above any general benefits. This special benefit is received by property over and above any general benefits from the additional Services. With reference to the engineering requirements for property related assessments, under Proposition 218, an engineer must determine and prepare a report evaluating the amount of special and general benefit received by property within the Assessment Area as a result of the improvements or services provided by a local agency. That special benefit is to be determined in relation to the total cost to that local entity of providing the service and/or improvements.

Proposition 218 as described in Article XIID of the California Constitution has confirmed that assessments must be based on the special benefit to property:

*"No assessment shall be imposed on any parcel which exceeds the reasonable cost of the proportional special benefit conferred on that parcel."*

The below benefit factors, when applied to property in the Assessment Area, confer special benefits to property and ultimately improve the safety, utility, functionality and usability of property in the Assessment Area. These are special benefits to property in the Assessment

Area in much the same way that storm drainage, sewer service, water service, lighting, sidewalks and paved streets enhance the safety, utility and functionality of each parcel of property served by these improvements, providing them with more utility of use and making them safer and more usable for occupants.

It should also be noted that Proposition 218 included a requirement that existing assessments in effect upon its effective date were required to be confirmed by either a majority vote of registered voters in the Assessment Area, or by weighted majority property owner approval using the new ballot proceeding requirements. However, certain assessments were excluded from these voter approval requirements. Of note is that in California Constitution Article XIID Section 5(a) this special exemption was granted to assessments for sidewalks, streets, sewers, water, flood control, drainage systems and vector control. The Howard Jarvis Taxpayers Association explained this exemption in their Statement of Drafter's Intent:

*"This is the "traditional purposes" exception. These existing assessments do not need property owner approval to continue. However, future assessments for these traditional purposes are covered."*<sup>3</sup>

Therefore, the drafters of Proposition 218 acknowledged that vector control assessments were a "traditional" and therefore acknowledged and accepted use.

Since all assessments, existing before or after Proposition 218 must be based on special benefit to property, the drafters of Proposition 218 inherently found that vector control services confer special benefit on property. Moreover, the statement of drafter's intent also acknowledges that any new or increased vector control assessments after the effective date of Proposition 218 would need to comply with the voter approval requirements it established. This is as an acknowledgement that additional assessments for such "traditional" purposes would be established after Proposition 218 was in effect. Therefore, the drafters of Proposition 218 clearly recognized vector assessments as a "traditional" use of assessments, acknowledged that new vector assessments may be formed after Proposition 218 and inherently were satisfied that vector control services confer special benefit to properties.

The Legislature made a specific determination after Proposition 218 was enacted that vector control services constitute a proper subject for special assessment. Health and Safety Code section 2082 provides that a district may levy special assessments consistent with the requirements of Article XIID of the California Constitution to finance vector control projects and programs. The intent of the Legislature to allow and authorize benefit assessments for vector control services after Proposition 218 is shown in the Assembly and Senate analysis the Mosquito Abatement and Vector Control District Law where it states that the law:

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<sup>3</sup> Howard Jarvis Taxpayers Association, "Statement of Drafter's Intent", January 1997.

*Allows special benefit assessments to finance vector control projects and programs, consistent with Proposition 218.<sup>4</sup>*

Therefore the State Legislature unanimously found that vector control services are a valuable and important public service - that can be funded by benefit assessments. To be funded by assessments, vector control services must confer special benefit to property.

### **MOSQUITO AND VECTOR CONTROL IS A SPECIAL BENEFIT TO PROPERTIES**

As described below, this Engineer's Report concludes that mosquito and vector control is a special benefit that provides direct advantages to property in the Assessment Area. For example, if approved, the assessment would provide reduced levels of mosquitoes and other vectors on property throughout the Assessment Area. Moreover, the assessment will reduce the risk of the presence of diseases on property throughout the Assessment Area, which is another direct advantage received by property in the Assessment Area. Moreover, the assessment will fund Services that improve the use of property and reduce the nuisance and harm created by vectors on property throughout the Assessment Area. These are tangible and direct special benefits that will be received by property throughout the specific area covered by the Assessment.

The following section, Benefit Factors, describes how and why vector control services specially benefit properties in the Assessment Area. These benefits are particular and distinct from its effect on property in general or the public at large.

### **BENEFIT FACTORS**

In order to allocate the assessments, the Engineer begins by identifying the types of special benefit arising from the aforementioned Services and that would be provided to property within the Assessment District. The following benefit factors have been established that represent the types of special benefit to parcels resulting from the Services to be financed with the assessment proceeds. These types of special benefit are as follows:

#### **REDUCED MOSQUITO AND VECTOR POPULATIONS ON PROPERTY AND AS A RESULT, ENHANCED DESIRABILITY, UTILITY, USABILITY AND FUNCTIONALITY OF PROPERTY IN THE ASSESSMENT AREA.**

The assessments will provide enhanced services for the control and abatement of nuisance and disease-carrying mosquitoes. These Services will materially reduce the number of vectors on properties throughout the Assessment Area. The lower mosquito and vector populations on property in the Assessment Area is a direct advantage to property that will serve to increase the desirability and "usability" of property. Clearly, properties are more desirable and usable in areas with lower mosquito populations and with a reduced risk of vector-borne disease. This is a special benefit to residential, commercial, agricultural, industrial and other types of properties because all such properties will directly benefit from

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<sup>4</sup> Senate Bill 1588, Mosquito Abatement and Vector Control District Law, Legislative bill analysis

reduced mosquito and vector populations and properties with lower vector populations are more usable, functional and desirable.

Excessive mosquitoes and other vectors in the area can materially diminish the utility and usability of property. For example, prior to the commencement of mosquito control and abatement services, properties in many areas in the State were considered to be nearly uninhabitable during the times of year when the mosquito populations were high.<sup>5</sup> The prevention or reduction of such diminished utility and usability of property caused by mosquitoes is a clear and direct advantage and special benefit to property in the Assessment Area.

The State Legislature made the following finding on this issue:

*“Excess numbers of mosquitoes and other vectors spread diseases of humans, livestock, and wildlife, reduce enjoyment of outdoor living spaces, both public and private, reduce property values, hinder outdoor work, reduce livestock productivity; and mosquitoes and other vectors can disperse or be transported long distances from their sources and are, therefore, a health risk and a public nuisance; and professional mosquito and vector control based on scientific research has made great advances in reducing mosquito and vector populations and the diseases they transmit.”<sup>6</sup>*

Mosquitoes and other vectors emerge from sources throughout the Assessment Area, and with an average flight range of two miles, mosquitoes from known sources can reach all properties in the Assessment Area. These sources include standing water in rural areas, such as marshes, pools, wetlands, ponds, drainage ditches, drainage systems, tree holes and other removable sources such as old tires and containers. The sources of mosquitoes also include numerous locations throughout the urban areas in the Assessment Area. These sources include underground drainage systems, containers, unattended swimming pools, leaks in water pipes, tree holes, flower cups in cemeteries, over-watered landscaping and lawns and many other sources. By controlling mosquitoes at known and new sources, the Services will materially reduce mosquito populations on property throughout the Assessment Area.

A recently increasing source of mosquitoes is unattended swimming pools:

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<sup>5</sup> Prior to the commencement of modern mosquito control services, areas in the State of California such as the San Mateo Peninsula, Napa County, Lake County and areas in Marin and Sonoma Counties had such high mosquito populations or other vector populations that they were considered to be nearly unlivable during certain times of the year and were largely used for part-time vacation cottages that were occupied primarily during the months when the natural vector populations were lower.

<sup>6</sup> Assembly Concurrent Resolution 52, chaptered April 1, 2003

*“Anthropogenic landscape change historically has facilitated outbreaks of pathogens amplified by peridomestic vectors such as Cx. pipiens complex mosquitoes and associated commensals such as house sparrows. The recent widespread downturn in the housing market and increase in adjustable rate mortgages have combined to force a dramatic increase in home foreclosures and abandoned homes and produced urban landscapes dotted with an expanded number of new mosquito habitats. These new larval habitats may have contributed to the unexpected early season increase in WNV cases in Bakersfield during 2007 and subsequently have enabled invasion of urban areas by the highly competent rural vector Cx. tarsalis. These factors can increase the spectrum of competent avian hosts, the efficiency of enzootic amplification, and the risk for urban epidemics.”<sup>7</sup>*

#### **INCREASED SAFETY OF PROPERTY IN THE ASSESSMENT AREA.**

The Assessments will result in improved year-round proactive Services to control and abate mosquitoes and other vectors that otherwise would occupy properties throughout the Assessment Area. Mosquitoes and other vectors are transmitters of diseases, so the reduction of mosquito and vector populations makes property safer for use and enjoyment. In absence of the assessments, these Services would not be provided, so the Services funded by the assessments make properties in the Assessment Area safer, which is a distinct special benefit to property in the Assessment Area.<sup>8</sup> This is not a general benefit to property in the Assessment Area or the public at large because the Services are tangible mosquito, vector and disease control services that will be provided directly to the properties in the Assessment Area and the Services are over and above what otherwise would be provided by the District or any other agency.

This finding was confirmed in 2003 by the State Legislature:

*“Mosquitoes and other vectors, including but not limited to, ticks, Africanized honey bees, rats, fleas, and flies, continue to be a source of human suffering, illness, death, and a public nuisance in California and around the world. Adequately funded mosquito and vector control, monitoring and public awareness programs are the best way to prevent outbreaks of West Nile Virus and other diseases borne by mosquitoes and other vectors.”<sup>9</sup>*

Also, the Legislature, in Health and Safety Code Section 2001, finds that:

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<sup>7</sup> Riesen William K. (2008). Delinquent Mortgages, Neglected Swimming Pools, and West Nile Virus, California. Emerging Infectious Diseases. Vol. 14(11).

<sup>8</sup> By reducing the risk of disease and increasing the safety of property, the proposed Services will materially increase the usefulness and desirability of certain properties in the Assessment Area.

<sup>9</sup> Assembly Concurrent Resolution 52, chaptered April 1, 2003

*“The protection of Californians and their communities against the discomforts and economic effects of vectorborne diseases is an essential public service that is vital to public health, safety, and welfare.”*

**REDUCTIONS IN THE RISK OF NEW DISEASES AND INFECTIONS ON PROPERTY IN THE ASSESSMENT AREA.**

Mosquitoes have proven to be a major contributor to the spread of new diseases such as West Nile Virus, among others. A highly mobile population combined with migratory bird patterns can introduce new mosquito-borne diseases into previously unexposed areas.

*“Vector-borne diseases (including a number that are mosquito-borne) are a major public health problem internationally. In the United States, dengue and malaria are frequently brought back from tropical and subtropical countries by travelers or migrant laborers, and autochthonous transmission of malaria and dengue occasionally occurs. In 1998, 90 confirmed cases of dengue and 1,611 cases of malaria were reported in the USA and dengue transmission has occurred in Texas.”<sup>10</sup>*

*“During 2004, 40 states and the District of Columbia (DC) have reported 2,313 cases of human WNV illness to CDC through ArboNET. Of these, 737 (32%) cases were reported in California, 390 (17%) in Arizona, and 276 (12%) in Colorado. A total of 1,339 (59%) of the 2,282 cases for which such data were available occurred in males; the median age of patients was 52 years (range: 1 month--99 years). Date of illness onset ranged from April 23 to November 4; a total of 79 cases were fatal.”<sup>11</sup> (According to the Centers for Disease Control and Prevention on January 19, 2004, a total of 2,470 human cases and 88 human fatalities from WNV have been confirmed).*

A study of the effect of aerial spraying conducted by the Sacramento-Yolo Mosquito and Vector Control District (SYMVCD) to control a West Nile Virus disease outbreak found that the SYMVCD's mosquito control efforts materially decreased the risk of new diseases in the treated areas:

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<sup>10</sup> Rose, Robert. (2001). Pesticides and Public Health: Integrated Methods of Mosquito Management. Emerging Infectious Diseases. Vol. 7(1); 17-23.

<sup>11</sup> Center for Disease Control. (2004). West Nile Virus Activity --- United States, November 9--16, 2004. Morbidity and Mortality Weekly Report. 53(45); 1071-1072.

*After spraying, infection rates decreased from 8.2 (95% CI 3.1–18.0) to 4.3 (95% CI 0.3–20.3) per 1,000 females in the spray area and increased from 2.0 (95% CI 0.1–9.7) to 8.7 (95% CI 3.3–18.9) per 1,000 females in the untreated area. Furthermore, no additional positive pools were detected in the northern treatment area during the remainder of the year, whereas positive pools were detected in the untreated area until the end of September (D.-E.A Elnaiem, unpub. data). These independent lines of evidence corroborate our conclusion that actions taken by SYMVCD were effective in disrupting the WNV transmission cycle and reducing human illness and potential deaths associated with WNV.<sup>12</sup>*

The Services funded by the assessments will help prevent on a year-round basis the presence of vector-borne diseases on property in the Assessment Area. This is another tangible and direct special benefit to property in the Assessment Area that would not be received in absence of the assessments.

#### **PROTECTION OF ECONOMIC ACTIVITY ON PROPERTY IN THE ASSESSMENT AREA.**

As recently demonstrated by the SARS outbreak in China and outbreaks of Avian Flu, outbreaks of pathogens can materially and negatively impact economic activity in the affected area. Such outbreaks and other public health threats can have a drastic negative effect on tourism, business and residential activities in the affected area. The assessments will help to prevent the likelihood of such outbreaks in the District.

Mosquitoes hinder, annoy and harm residents, guests, visitors, farm workers, and employees. A vector-borne disease outbreak and other related public health threats would have a drastic negative effect on agricultural, business and residential activities in the Assessment Area.

The economic impact of diseases is well documented. According to a study prepared for the Centers for Disease Control and Prevention, economic losses due to the transmission of West Nile Virus in Louisiana was estimated to cost over \$20 million over approximately one year:

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<sup>12</sup> Carney, Ryan. (2008), Efficiency of Aerial Spraying of Mosquito Adulticide in Reducing the Incidence of West Nile Virus, California, 2005. Emerging Infectious Diseases, Vol 14(5)

*The estimated cost of the Louisiana epidemic was \$20.1 million from June 2002 to February 2003, including a \$10.9 million cost of illness (\$4.4 million medical and \$6.5 million nonmedical costs) and a \$9.2 million cost of public health response. These data indicate a substantial short-term cost of the WNV disease epidemic in Louisiana.* <sup>13</sup>

Moreover, a study conducted in 1996-97 of La Crosse Encephalitis (LACE), a human illness caused by a mosquito-transmitted virus, found a lifetime cost per human case at \$48,000 to \$3,000,000 and found that the disease significantly impacted lifespans of those who were infected. Following is a quote from the study which references the importance and value of active vector control services of the type that would be funded by the assessments:

*The socioeconomic burden resulting from LACE is substantial, which highlights the importance of the illness in western North Carolina, as well as the need for active surveillance, reporting, and prevention programs for the infection.* <sup>14</sup>

The Services to be funded by the assessments will help prevent the likelihood of such outbreaks on property in the Assessment Area and will reduce the harm to economic activity on property caused by existing mosquito populations. This is another direct advantage received by property in the Assessment Area that would not be received in absence of the assessments.

#### **PROTECTION OF ASSESSMENT AREA'S AGRICULTURE, TOURISM, AND BUSINESS INDUSTRIES.**

The agriculture, tourism and business industries will benefit from reduced levels of harmful or nuisance mosquitoes and other vectors. Conversely, any outbreaks of emerging vector-borne pathogens such as West Nile Virus could also materially negatively affect these industries. Diseases transmitted by mosquitoes and other vectors can adversely impact business and recreational functions.

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<sup>13</sup> Zohrabian A, Meltzer MI, Ratard R, Billah K, Molinari NA, Roy K, et al. West Nile Virus economic impact, Louisiana, 2002. Emerging Infectious Disease, 2004 Oct. Available from <http://www.cdc.gov/ncidod/EID/vol10no10/03-0925.htm>

<sup>14</sup> Utz, J. Todd, Apperson, Charles S., Maccormack, J. Newton, Salyers, Martha, Dietz, E. Jacquelin, Mcpherson, J. Todd, Economic And Social Impacts Of La Crosse Encephalitis In Western North Carolina, Am J Trop Med Hyg 2003 69: 509-518

*A study prepared for the United States Department of Agriculture in 2003 found that over 1,400 horses died from West Nile Virus in Colorado and Nebraska and that these fatal disease cases created over \$1.2 million in costs and lost revenues. In addition, horse owners in these two states spent over \$2.75 million to vaccinate their horses for this disease. The study states that “Clearly, WNV has had a marked impact on the Colorado and Nebraska equine industry.”<sup>15</sup>*

*Pesticides for mosquito control impart economic benefits to agriculture in general. Anecdotal reports from farmers and ranchers indicate that cattle, if left unprotected, can be exsanguinated by mosquitoes, especially in Florida and other southeast coastal areas. Dairy cattle produce less milk when bitten frequently by mosquitoes<sup>16</sup>*

The assessments will serve to protect the businesses and industries and the employees and residents that benefit from these businesses and industries. This is a direct advantage and special benefit to property in the Assessment Area.

#### **REDUCED RISK OF NUISANCE AND LIABILITY ON PROPERTY IN THE ASSESSMENT AREA**

In addition to health related factors, uncontrolled mosquito and vector populations create a nuisance for the occupants of property in the Assessment Area. Properties in the Assessment Area, therefore, will benefit from the reduced nuisance factor that will be created by the Services. Agricultural and rangeland properties also benefit from the reduced nuisance factor and harm to livestock and employees from lower mosquito and vector populations.

Agricultural, range, golf course, cemetery, open space and other such lands in the Assessment Area contain large areas of mosquito and vector habitat and are therefore a significant source of mosquito and vector populations. In addition, residential and business properties in the Assessment Area can also contain significant sources.<sup>17</sup> It is conceivable that sources of mosquitoes could be held liable for the transmission of diseases or other harm. For example, in August 2004, the City of Los Angeles approved new fines of up to \$1,000 per day for property owners who don't remove standing water sources of mosquitoes on their property.

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<sup>15</sup> S. Geiser, A. Seitzinger, P. Salazar, J. Traub-Dargatz, P. Morley, M. Salman, D. Wilmot, D. Steffen, W. Cunningham, Economic Impact of West Nile Virus on the Colorado and Nebraska Equine Industries: 2002, April 2003, Available from

[http://www.aphis.usda.gov/vs/ceah/cnabs/nahms/equine/wnv2002\\_CO\\_NB.pdf](http://www.aphis.usda.gov/vs/ceah/cnabs/nahms/equine/wnv2002_CO_NB.pdf)

<sup>16</sup> Jennings, Allen. (2001). USDA Letter to EPA on Fenthion IRED. United States Department of Agriculture, Office of Pest Management Policy. March 8, 2001.

<sup>17</sup> Sources of mosquitoes on residential, business, agricultural, range and other types of properties include removable sources such as containers that hold standing water.

The Services will serve to protect the businesses and industries in the Assessment Area. This is a direct advantage and a special benefit to property in the Assessment Area.

#### **IMPROVED MARKETABILITY OF PROPERTY.**

As described previously, the Services will specially benefit properties in the Assessment Area by making them more useable, livable and functional. The Services also make properties in the Assessment Area more desirable, and more desirable properties also benefit from improved marketability. This is another tangible and direct special benefit to property which will not be enjoyed in absence of the Services.<sup>18</sup>

#### **BENEFIT FINDING**

In summary, the special benefits described in this Report and the expansion of Services in the Assessment Area directly benefit and protect the real properties in the Assessment Area in excess of the assessments for these properties. Therefore, the assessment engineer finds that the cumulative special benefits to property from the Services are reasonably equal to or greater than the annual assessment amount per benefit unit.

#### **GENERAL VS. SPECIAL BENEFIT**

Article XIII C of the California Constitution requires any local agency proposing to increase or impose a benefit assessment to “separate the general benefits from the special benefits conferred on a parcel.” The rationale for separating special and general benefits is to ensure that property owners subject to the benefit assessment are not paying for general benefits. The assessment can fund the special benefits to property in the Assessment Area but cannot fund any general benefits. Accordingly, a separate estimate of the special and general benefit is given in this section.

In other words:

<b>Total Benefit</b>	<b>=</b>	<b>General Benefit</b>	<b>+</b>	<b>Special Benefit</b>
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There is no widely-accepted or statutory formula for general benefit from vector control services. General benefits are benefits from improvements or services that are not special in nature, are not “particular and distinct” and are not “over and above” benefits received by other properties. General benefits are conferred to properties located “in the district,<sup>19</sup>” but

<sup>18</sup> If one were to compare two hypothetical properties with similar characteristics, the property with lower mosquito infestation and reduced risk of vector-borne disease will clearly be more desirable, marketable and usable.

<sup>19</sup> SVTA vs. SCCOSA explains as follows:

outside the narrowly-drawn Assessment Area and to “the public at large.” SVTA vs. SCCOSA provides some clarification by indicating that general benefits provide “an indirect, derivative advantage” and are not necessarily proximate to the improvements and services funded by the assessments.

A formula to estimate the general benefit is listed below:

<b>General Benefit</b>	=	<b>Benefit to Real Property Outside the Assessment District</b>	+	<b>Benefit to Real Property Inside the Assessment District that is Indirect and Derivative</b>	+	<b>Benefit to the Public at Large</b>
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Special benefit, on the other hand, is defined in the state constitution as “a particular and distinct benefit over and above general benefits conferred on real property located in the district or to the public at large.” The SVTA v. SCCOSA decision indicates that a special benefit is conferred to a property if it “receives a direct advantage from the improvement (e.g., proximity to a park).” In this assessment, the overwhelming proportion of the benefits conferred to property is special, since the advantages from the mosquito, vector and disease control/protection funded by the Assessments are directly received by the properties in the Assessment Area and are only minimally received by property outside the Assessment Area or the public at large.

Proposition 218 twice uses the phrase “over and above” general benefits in describing special benefit. (Art. XIID, sections 2(i) & 4(f).) There currently are some mosquito and vector related services being provided to the Assessment Area. Consequently, there currently are some mosquito control related benefits being provided to the Assessment Area and any new and extended service provided by the District are over and above this baseline. Arguably, all of the Services to be funded by the assessment therefore there is a special benefit because the additional Services would particularly and distinctly benefit and protect the Assessment Area over and above the previous baseline benefits and service.

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OSA observes that Proposition 218’s definition of “special benefit” presents a paradox when considered with its definition of “district.” Section 2, subdivision (i) defines a “special benefit” as “a particular and distinct benefit over and above general benefits conferred on real property located in the district or to the public at large.” (Art. XIII D, § 2, subd. (i), italics added.) Section 2, subdivision (d) defines “district” as “an area determined by an agency to contain all parcels which will receive a special benefit from a proposed public improvement or property-related service.” (Art. XIII D, § 2, subd. (d), italics added.) In a well-drawn district — limited to only parcels receiving special benefits from the improvement — every parcel within that district receives a shared special benefit. Under section 2, subdivision (i), these benefits can be construed as being general benefits since they are not “particular and distinct” and are not “over and above” the benefits received by other properties “located in the district.”

We do not believe that the voters intended to invalidate an assessment district that is narrowly drawn to include only properties directly benefiting from an improvement. Indeed, the ballot materials reflect otherwise. Thus, if an assessment district is narrowly drawn, the fact that a benefit is conferred throughout the district does not make it general rather than special.

Nevertheless, arguably some of the Services benefit the public at large and properties outside the Assessment Area. In this report, the general benefit is conservatively estimated and described, and then budgeted so that it is funded by sources other than the assessment.

In the 2009 Dahms case, the court upheld an assessment that was 100% special benefit on the rationale that the services funded by the assessments were directly provided to property in the assessment district. Similar to the assessments in Pomona that were validated by Dahms, the Assessments described in this Engineer's Report fund mosquito, vector and disease control services directly provided to property in the assessment area. Moreover, as noted in this Report, the Services directly reduce mosquito and vector populations on all property in the assessment area. Therefore, Dahms establishes a basis for minimal or zero general benefits from the Assessments. However, in this report, the general benefit is more conservatively estimated and described, and then budgeted so that it is funded by sources other than the assessment.

### **CALCULATING GENERAL BENEFIT**

Without this assessment the District would lack the funds to extend the additional Services to the Assessment Area. The only additional service that is being provided is the vector control program assessment-funded Services. Consistent with footnote 8 of SVTA v. SCCOSA, and for the reasons described above, the District has determined that all parcels in the Assessment Area receive a shared direct advantage and special benefit from the Services. The Services directly and particularly serve and benefit each parcel, and are not a mere indirect, derivative advantage. As explained above, Proposition 218 relies on the concept of "over and above" in distinguishing special benefits from general benefits. As applied to an assessment proceeding concurrent with the annexation this concept means that all vector control services, which provide direct advantage to property in the Assessment Area, are over and above the baseline and therefore are special.

Nevertheless, the Services may provide a degree of general benefit, in addition to the predominant special benefit. This section provides a conservative measure of the general benefits from the Assessments.

### **BENEFIT TO PROPERTY OUTSIDE THE DISTRICT**

Properties within the Assessment Area receive almost all of the special benefits from the Services because the Services funded by the Assessments will be provided directly to protect property within the Assessment Area from mosquitoes and vector-borne diseases. However, properties adjacent to, but just outside of, the boundaries may receive some benefit from the Services in the form of reduced mosquito populations on property outside the Assessment Area. Since this benefit, is conferred to properties outside the district boundaries, it contributes to the overall general benefit calculation and will not be funded by the assessment.

A measure of this general benefit is the proportion of Services that would affect properties outside of the Assessment Area. Each year, the District will provide some of its Services in

areas near the boundaries of the Assessment Area. By abating mosquito populations near the borders of the Assessment Area, the Services could provide benefits in the form of reduced mosquito populations and reduced risk of disease transmission to properties outside the Assessment Area. If mosquitoes were not controlled inside the Assessment Area, more of them would fly from the Assessment Area. Therefore control of mosquitoes within the Unprotected Areas provides some benefit to properties outside the Assessment Area but within the normal travel range of vectors, in the form of reduced mosquito populations and reduced vector-borne disease transmission. This is a measure of the general benefits to property outside the Assessment Area because this is a benefit from the Services that is not specially conferred upon property in the assessment area.

The mosquito potential outside the Assessment Area is based on studies of mosquito dispersion concentrations. Mosquitoes can travel up to two miles, on average, so this destination range is used. Based on studies of mosquito destinations, relative to parcels in the Assessment Area average concentration of mosquitoes from the Unprotected Areas on properties within two miles of the Assessment Area is calculated to be 6%.<sup>20</sup> This relative vector population reduction factor within the destination range is combined with the number of parcels outside the Assessment Area and within the destination range to measure this general benefit and is calculated as follows:

**Criteria:**

Mosquitoes may fly up to 2 miles from their breeding source.

21,157 parcels within 2 miles of, but outside of the District, may receive some mosquito and disease protection benefit.

6% portion of relative benefit that is received

217,290 Parcels in the District

**Calculations:**

Total Benefit = 21,157 parcels \* 6% = 1,269 parcels equivalents

Percentage of overall parcel equivalents =  $1,269 / 217,290 = 0.58\%$

Therefore, for the overall benefits provided by the Services to the Assessment Area, it is determined that 0.58% of the benefits is received by the parcels within two miles of the Assessment Area boundaries. Recognizing that this calculation is an approximation, this benefit will be rounded up to 1.0%.

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<sup>20</sup> Tietze, Noor S., Stephenson, Mike F., Sidhom, Nader T. and Binding, Paul L., "Mark-Recapture of *Culex Erythrothorax* in Santa Cruz County, California", Journal of the American Mosquito Control Association, 19(2):134-138, 2003.

### **BENEFIT TO PROPERTY *INSIDE* THE DISTRICT THAT IS *INDIRECT AND DERIVATIVE***

The “indirect and derivative” benefit to property within the Assessment Area is particularly difficult to calculate. As explained above, all benefit within the Assessment Area is special because the mosquito and disease control services in the Assessment Area would provide direct service and protection that is clearly “over and above” and “particular and distinct” when compared with the level of such protection under current conditions. Further the properties are within the Assessment Area boundaries and this Engineer’s Report demonstrates the direct benefits received by individual properties from mosquito and disease control services.

In determining the Assessment Area, the District had been careful to limit it to an area of parcels that would directly receive the Services. All parcels directly benefit from the surveillance, monitoring and treatment that will be provided on an equivalent basis throughout the Assessment Area in order to maintain the same improved level of protection against mosquitoes and other vectors and reduced mosquito and vector populations throughout the area. The surveillance and monitoring sites are spread on a balanced basis throughout the area. Mosquito and vector control and treatment are provided as needed throughout the area based on the surveillance and monitoring results. The shared special benefit - reduced mosquito levels and reduced presence of vector-borne diseases - are received on an equivalent basis by all parcels in the Assessment Area. Furthermore, all parcels in the Assessment Area directly benefit from the ability to request service from the District and to have a District field technician promptly respond directly to the parcel and address the owner’s or resident’s service need. The SVTA vs. SCCOSA decision indicates that the fact that a benefit is conferred throughout the Assessment Area does not make the benefit general rather than special, so long as the Assessment Area is narrowly drawn and limited to the parcels directly receiving shared special benefits from the service. The District therefore concludes that, other than the small general benefit to properties outside the Assessment Area (discussed above) and to the public at large (discussed below), all of the benefits of the Services to the parcels within the Assessment Area are special benefits and it is not possible or appropriate to separate any general benefits from the benefits conferred on parcels in the Assessment Area.

### **BENEFIT TO THE PUBLIC AT LARGE**

With the type and scope of Services to be provided to the Assessment Area, it is very difficult to calculate and quantify the scope of the general benefit conferred on the public at large. Because the Services directly serve and benefit all of the property in the Assessment Area, any general benefit conferred on the public at large is small. Nevertheless, there is some indirect general benefit to the public at large.

The public at large uses the public highways, streets and sidewalks, and when traveling in and through the Assessment Area they will benefit from the Services. A fair and appropriate measure of the general benefit to the public at large therefore is the amount of highway, street and sidewalk area within the Assessment Area relative to the overall land area. An analysis of maps of the Assessment Area shows that approximately 4% of the land area in the Assessment Area is covered by highways, streets and sidewalks. This 4% therefore is

a fair and appropriate measure of the general benefit to the public at large within the Assessment Area

### **SUMMARY OF GENERAL BENEFITS**

Using a sum of the measures of general benefit for the public at large and land outside the Assessment Area, we find that approximately 4.6% of the benefits conferred by the Mosquito and Disease Control Assessment may be general in nature and should be funded by sources other than the Assessment.

#### **General Benefit Calculation**

	<b>1.0%</b>	<b>(Outside the District)</b>
<b>+</b>	<b>0.0%</b>	<b>(Property within the Assessment District)</b>
<b>+</b>	<b>3.6%</b>	<b>(Public at Large)</b>
<b>=</b>	<b>4.6%</b>	<b>(Total General Benefit)</b>

Although this analysis supports the findings that 4.6% of the assessment may provide general benefit only, this number is increased by the Assessment Engineer to 10% to conservatively ensure that no assessment revenue is used to support general benefit. This additional amount allocated to general benefit also covers general benefit to parcels in the Assessment Area, if it is later determined that there is some general benefit conferred on those parcels.

The Mosquito, Vector and Disease Control assessment total budget for mosquito and vector abatement, disease control, and capital improvement is \$9,221,555. Of this total budget amount, the District will contribute \$7,167,910, or 77% of the total budget from sources other than the Mosquito, Vector and Disease Control assessment. This contribution more than offsets any general benefits from the Mosquito, Vector and Disease Control Assessment Services.

### **ZONES OF BENEFIT**

The District's mosquito, vector, and disease control programs, projects and Services that will be funded by the Mosquito, Vector and Disease Control Assessment will be provided in all areas within the District's boundaries. Parcels of similar type in the District would receive similar mosquito and vector abatement benefits on a per parcel and land area basis.

The SVTA vs. SCCOSA decision indicates:

*In a well-drawn district — limited to only parcels receiving special benefits from the improvement — every parcel within that district receives a shared special benefit. Under section 2, subdivision (i), these benefits can be construed as being general benefits since they are not “particular and distinct” and are not “over and above” the benefits received by other properties “located in the district.”*

*We do not believe that the voters intended to invalidate an assessment district that is narrowly drawn to include only properties directly benefitting from an improvement. Indeed, the ballot materials reflect otherwise. Thus, if an assessment district is narrowly drawn, the fact that a benefit is conferred throughout the district does not make it general rather than special. In that circumstance, the characterization of a benefit may depend on whether the parcel receives a direct advantage from the improvement (e.g., proximity to park) or receives an indirect, derivative advantage resulting from the overall public benefits of the improvement (e.g., general enhancement of the district’s property values).*

In 2009 and 2010, the District completed an analysis of service levels throughout its boundaries. In particular, the District evaluated service levels in regard to its core services including surveillance, larviciding and service requests; and confirmed that service levels and benefits are essentially equivalent across all parcels, except as described below. Regarding service requests, the District will respond to any parcel located within the District, regardless of how remote, and provide mosquito control services appropriate to the situation. Similarly, larvicide applications generally are applied throughout the District.

However, the District’s evaluation showed that service levels did vary slightly in two distinct ways, and has created three zones accordingly:

- Zone A: Special Service Level
- Zone B: Reduced Special Service Level
- Zone C: Special Service Level with Extraordinary Habitat

#### **ZONE A: SPECIAL SERVICE AREA**

This zone includes all parcels that receive the typical service level provided by the District. Over 80% of the District parcels are within this zone.

#### **ZONE B: REDUCED SPECIAL SERVICE LEVEL**

This zone includes parcels that receive a slightly lower level of service due to their remote location and sparse population. Zone B includes a large area in the southwest corner of the District as well as three smaller areas along the east edge. There are approximately 493 parcels in Zone B. Zone B parcels receive a reduction in assessment, corresponding to the reduced service level, of 5%.

### **ZONE C: SPECIAL SERVICE LEVEL WITH EXTRAORDINARY HABITAT**

This zone includes parcels that receive a slightly higher level of service resulting from their environment and topography within the Delta, and the fact that these parcels are ideal mosquito habitat. In order to maintain an acceptable service level, the District expends additional resources in this area – without these services, the utility of these parcels would be compromised. Zone C includes parcels within the Delta due west of Stockton. There are approximately 43,080 parcels in Zone C. Zone C parcels receive an increase in assessment, corresponding to the increased service level, of 5%. The maximum authorized rate is \$10.26 and the rate for Zone C is below the maximum authorized rate.

### **METHOD OF ASSESSMENT**

As previously discussed, the Assessments fund enhanced, comprehensive, year-round mosquito and vector control, disease surveillance and control Services that will reduce mosquito and vector populations on property and will clearly confer special benefits to properties in the Assessment Area. These benefits can also partially be measured by the occupants on property in the Improvement District because such parcel population density is a measure of the relative benefit a parcel receives from the Improvements. Therefore, the apportionment of benefit is partially based the population density of parcels. It should be noted that many other types of “traditional” assessments also use parcel population densities to apportion the assessments. For example, the assessments for sewer systems, roads and water systems are typically allocated based on the population density of the parcels assessed.

Moreover, assessments have a long history of use in California and are in large part based on the principle that any benefits from a service or improvement funded by assessments that is enjoyed by tenants and other non-property owners ultimately is conferred directly to the underlying property.<sup>21</sup>

With regard to benefits and source locations, the assessment engineer determined that since mosquitoes and other vectors readily fly from their breeding locations to all properties in their flight range and since mosquitoes are actually attracted to properties occupied by people or animals, the benefits from mosquito and vector control extend beyond the source locations to all properties that would be a “destination” for mosquitoes and other vectors. In other words, the control and abatement of mosquito and vector populations ultimately

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<sup>21</sup> For example, in *Federal Construction Co. v. Ensign* (1922) 59 Cal.App. 200 at 211, the appellate court determined that a sewer system specially benefited property even though the direct benefit was to the people who used the sewers: “Practically every inhabitant of a city either is the owner of the land on which he resides or on which he pursues his vocation, or he is the tenant of the owner, or is the agent or servant of such owner or of such tenant. And since it is the inhabitants who make by far the greater use of a city’s sewer system, it is to them, as lot owners or as tenants, or as the servants or agents of such lot owners or tenants, that the advantages of actual use will redound. But this advantage of use means that, in the final analysis, it is the lot owners themselves who will be especially benefited in a financial sense.”

confers benefits to all properties that are a destination of mosquitoes and vectors, rather than just those that are sources of mosquitoes.

Although some primary mosquito and vector sources may be located outside of residential areas, residential properties can and do generate their own, often significant, populations of mosquitoes and vector organisms. For example, storm water catch basins in residential areas are a common source of mosquitoes. Since the typical flight range for a female mosquito, on average is 2 miles, most homes in the Assessment Area are within the flight zone of many mosquito sources. Moreover, there are many other common residential sources of mosquitoes, such as miscellaneous backyard containers, neglected swimming pools, leaking water pipes and tree holes. Clearly, there is a potential for mosquito sources on virtually all types of property. More importantly, all properties in the Assessment Area are within the destination range of mosquitoes and most properties are actually within the destination range of multiple mosquito source locations.

Because the Services will be provided throughout the Assessment Area with the same level of control objective in each zone, mosquitoes can rapidly and readily fly from their breeding locations to other properties over a large area, and because there are current or potential breeding sources literally everywhere in the Assessment Area, the Assessment Engineer determined that all similar properties in the Assessment Area have generally equivalent mosquito "destination" potential and, therefore, receive equivalent levels of benefit within areas in a same Zone of Benefit.

In the process of determining the appropriate method of assessment, the Engineer considered various alternatives. For example, a fixed assessment amount per parcel for all residential improved property was considered but was determined to be inappropriate because agricultural lands, commercial property and other property also receive benefits from the assessments. Likewise, an assessment exclusively for agricultural land was considered but deemed inappropriate because other types of property, such as residential and commercial, also receive the special benefit factors described previously.

A fixed or flat assessment was deemed to be inappropriate because larger residential, commercial and industrial properties receive a higher degree of benefit than other similarly used properties that are significantly smaller. (For two properties used for commercial purposes, there is clearly a higher benefit provided to a property that covers several acres in comparison to a smaller commercial property that is on a 0.25 acre site. The larger property generally has a larger coverage area and higher usage by employees, customers, tourists and guests that would benefit from reduced mosquito and vector populations, as well as the reduced threat from diseases carried by mosquitoes and other vectors. This benefit ultimately flows to the property.) Larger commercial, industrial and apartment parcels, therefore, receive an increased benefit from the assessments.

In conclusion, the assessment engineer determined that the appropriate method of assessment apportionment should be based on the type and use of property, the relative

size of the property its relative population and usage potential, and its destination potential for mosquitoes. This method is further described below.

### ASSESSMENT APPORTIONMENT

The special benefits derived from the Mosquito, Vector and Disease Control Assessment are conferred on property and are not based on a specific property owner's occupancy of property or the property owner's demographic status, such as age or number of dependents. However, it is ultimately people who do or could use the property and who enjoy the special benefits described above. Therefore, the opportunity to use and enjoy the region within the Assessment Area without the excessive nuisance, diminished "livability" or the potential health hazards brought by mosquitoes, vectors, and the diseases they carry is a special benefit to properties in the Assessment Area. This benefit can in part be measure by the number of people who potentially live on, work at, visit or otherwise use the property, because people ultimately determine the value of the benefits by choosing to live, work and/or recreate in the area, and by choosing to purchase property in the area.<sup>22</sup>

In order to apportion the cost of the Services to property, each property in the Assessment Area is assigned a relative special benefit factor. This process involves determining the relative benefit received by each property in relation to a single family home, or, in other words, on the basis of Single Family Equivalents (SFE). This SFE methodology is commonly used to distribute assessments in proportion to estimated special benefit. For the purposes of this Engineer's Report, all properties are designated a SFE value, which is each property's relative benefit in relation to a "benchmark" parcel in the Assessment Area. The "benchmark" property is the single family detached dwelling on a parcel of less than one acre. This benchmark parcel is assigned one Single Family Equivalent benefit unit or one SFE.

The calculation of the special benefit apportionment and relative benefit to properties in the Assessment Area from the Services is summarized in the following equation:

$$\text{Special Benefit (per property)} = \sum f(\text{Special Benefits}) * \sum f(\text{Property Specific Attributes}^1)$$

1. Such as use, property type, size, as well as vector-specific attributes such as destination potential and population potential.

### RESIDENTIAL PROPERTIES

Certain residential properties in the Assessment Area that contain a single residential dwelling unit are assigned one Single Family Equivalent or 1.0 SFE. Traditional houses,

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<sup>22</sup> It should be noted that the benefits conferred upon property are related to the average number of people who could potentially live on, work at or otherwise could use a property, not how the property is currently used by the present owner.

zero-lot line houses, and town homes are included in this category of single family residential property.

Single family residential properties in excess of one acre receive additional benefit relative to a single family home on less than one acre, because the larger parcels provide more area for mosquito sources and District vector Services. Therefore, such larger parcels receive additional benefits relative to a single family home on less than one acre and are assigned 1.0 SFE for the residential unit and an additional rate of 0.0021 SFE per one-fourth acre of land area in excess of one acre. Mobile home parcels on a separate parcel and in excess of one acre also receive this additional acreage rate.

Other types of properties with residential units, such as agricultural properties, are assigned the residential SFE rates for the dwelling units on the property and are assigned additional SFE benefit units for the agricultural-use land area.

Properties with more than one residential unit are designated as multi-family residential properties. These properties, along with condominiums, benefit from the Services in proportion to the number of dwelling units that occupy each property, the average number of people who reside in each property, and the average size of each property in relation to a single family home in the District. This Report analyzed San Joaquin County population density factors from the 2000 US Census as well as average dwelling unit size for each property type. After determining the Population Density Factor and Square Footage Factor for each property type, an SFE rate is generated for each residential property structure, as indicated in Figure 3 below.

The SFE factor of 0.32 per dwelling unit for multifamily residential properties applies to such properties with one to twenty units. Properties in excess of twenty units typically offer on-site management, monitoring and other control services that tend to offset some of the benefits provided by the Mosquito and Vector Control Assessment District. Therefore the benefit for properties in excess of 20 units is determined to be 0.32 SFE per unit for the first 20 units and 0.10 SFE per each additional unit in excess of 20 dwelling units.

**FIGURE 3 – RESIDENTIAL ASSESSMENT FACTORS**

	<i>Total Population</i>	<i>Occupied Households</i>	<i>Persons per Household</i>	<i>Pop. Density Equivalent</i>	<i>SqFt Factor</i>	<i>Proposed Rate</i>
Single Family Residential	394,029	125,355	3.14	1.00		1.00
Condominium	35,951	10,767	3.34	1.06	0.68	0.72
Duplex, Triplex, Fourplex	37,162	12,605	2.95	0.94	0.58	0.54
Multi-Family Residential	57,101	24,482	2.33	0.74	0.44	0.32
Mobile Home	19,872	8,053	2.47	0.79	0.42	0.33

Source: 2000 Census, San Joaquin County and property dwelling size information from the San Joaquin County Assessor data and other sources.

## COMMERCIAL/INDUSTRIAL PROPERTIES

Commercial and industrial properties are generally open and operated for more limited times, relative to residential properties. Therefore, the relative hours of operation can be used as a measure of benefits, since employee density also provides a measure of the relative benefit to property. Since commercial and industrial properties are typically open and occupied by employees approximately one-half the time of residential properties, it is reasonable to assume that commercial land uses receive one-half of the special benefit on a land area basis relative to single family residential property.

The average size of a single family home with 1.0 SFE factor in the District is 0.25 acres. Therefore, a commercial property with 0.25 acres receives one-half the relative benefit, or a 0.50 SFE factor.

The SFE values for various commercial and industrial land uses are further defined by using average employee densities because the special benefit factors described previously are also related to the average number of people who work at commercial/industrial properties.

To determine employee density factors, this Report utilizes the findings from the San Diego County Association of Governments Traffic Generators Study (the "SANDAG Study") because these findings were approved by the State Legislature which determined the SANDAG Study to be a good representation of the average number of employees per acre of land area for commercial and industrial properties. As determined by the SANDAG Study, the average number of employees per acre for commercial and industrial property is 24. As presented in Table 2, the SFE factors for other types of businesses are determined relative to their typical employee density in relation to the average of 24 employees per acre of commercial property.

Commercial and industrial properties in excess of 5 acres generally involve uses that are more land intensive relative to building areas and number of employees (lower coverage ratios). As a result, the benefit factors for commercial and industrial property land area in excess of 5 acres is determined to be the SFE rate per fourth acre for the first 5 acres and the relevant SFE rate per each additional acre over 5 acres. Institutional properties that are used for residential, commercial or industrial purposes are also assessed at the appropriate residential, commercial or industrial rate.

Self-storage and golf course property benefit factors are similarly based on average usage densities. Table 2 below lists the benefit assessment factors for such business properties.

## AGRICULTURAL, RANGELAND, AND CEMETERY PROPERTIES

Utilizing research and agricultural employment reports from UC Davis and the California Employment Development Department and other sources, this Report calculated an average usage density of 0.05 people per acre for agriculture property, 0.01 for rangelands and timber and 1.2 for cemeteries. Since these properties typically are a source of mosquitoes and/or are typically closest to other sources of mosquitoes and other vectors, it is reasonable to determine that the benefit to these properties is twice the usage density

ratio of commercial and industrial properties. The SFE factors per 0.25 acres of land area are shown in the following Figure 4.

**FIGURE 4 – COMMERCIAL/INDUSTRIAL BENEFIT ASSESSMENT FACTORS**

<i>Type of Commercial/Industrial Land Use</i>	<i>Average Usage Per Acre <sup>1</sup></i>	<i>SFE Units per Fraction Acre <sup>2</sup></i>	<i>SFE Units per Acre After 5</i>
Commercial	24	0.500	0.500
Office	68	1.420	1.420
Shopping Center	24	0.500	0.500
Industrial	24	0.500	0.500
Self Storage or Parking Lot	1	0.021	
Winery	12.00	0.250	
Golf Course	3.00	0.063	
Cemetery	1.20	0.050	
Agriculture	0.05	0.0021	
Rangelands/Timber	0.010	0.00042	

1. Source: San Diego Association of Governments Traffic Generators Study, University of California, Davis and other studies and sources.

2. The SFE factors for commercial and industrial parcels indicated above are applied to each fourth acre of land area or portion thereof. (Therefore, the minimum assessment for any assessable parcel in these categories is the SFE Units listed herein.)

## VACANT PROPERTIES

The benefit to vacant properties is determined to be proportional to the corresponding benefits for similar type developed properties. However, vacant properties are assessed at a lower rate due to the lack of active benefits, as measured by use by residents, employees, customers and guests. A measure of the benefits accruing to the underlying land is the average value of land in relation to improvements for developed property. An analysis of the assessed valuation data from the County of San Joaquin found that 30% of the assessed value of improved properties is classified as land value. Since vacant properties have very low to zero population/use densities until they are developed, a 50% benefit discount is applied to the valuation factor of 0.30 to account for the current low use density and potential for harm or nuisance to the property owner or his residents, employees, customers and guests. The combination of these measures results in a 0.15 factor. It is reasonable to assume, therefore, that approximately 15% of the benefits are related to the underlying land and 85% are related to the day-to-day use of the property. Using this ratio, the SFE factor for vacant parcels is 0.15 per parcel.

## OTHER PROPERTIES

Article XIIIID stipulates that publicly owned properties must be assessed unless those properties are reasonably determined to receive no special benefit from the assessment.

All properties that are specially benefited are assessed. Publicly owned property that is used for purposes similar to private residential, commercial, industrial or institutional uses is benefited and assessed at the same rate as such privately owned property.

Other public properties such as watershed parcels, parks, open space parcels are determined to, on average, receive similar benefits as a single family home. Therefore such parcels are assessed an SFE benefit factor of 1. Miscellaneous, small and other parcels such as roads, right-of-way parcels, and common areas typically do not generate significant numbers of employees, residents, customers or guests and have limited economic value. These miscellaneous parcels receive minimal benefit from the Services and are assessed an SFE benefit factor of 0.

Church parcels, institutional properties, and property used for educational purposes typically generate employees on a less consistent basis than other non-residential parcels. Many of these properties with higher population factors provide on-site management, monitoring and other control services that tend to offset some of the benefits provided by the mosquito and vector control district. Therefore, these parcels are determined to, on average, receive similar benefits as a single family home. Therefore such parcels are assessed an SFE benefit factor of 1.

#### **DURATION OF ASSESSMENT**

The Assessments were approved to be levied for fiscal year 2006-07 and continued every year thereafter, so long as vectors remain in existence and the District requires funding from the Assessment for its Services. Therefore, the Assessment can be continued annually after the District board approves an annually updated Engineer's Report, budget for the Assessment, Services to be provided and other specifics of the Assessment. In addition, the District board must hold an annual public hearing to continue the Assessment.

#### **APPEALS AND INTERPRETATION**

Any property owner who feels that the assessment levied on the subject property is in error as a result of incorrect information being used to apply the foregoing method of assessment, may file a written appeal with the District Manager of the San Joaquin County Mosquito and Vector Control District or his or her designee. Any such appeal is limited to correction of an assessment during the then current fiscal year or, if before July 1, the upcoming fiscal year. Upon the filing of any such appeal, the District Manager or his or her designee will promptly review the appeal and any information provided by the property owner. If the District Manager or his or her designee finds that the assessment should be modified, the appropriate changes shall be made to the assessment roll. If any such changes are approved after the assessment roll has been filed with the San Joaquin County for collection, the District Manager or his or her designee is authorized to refund to the property owner the amount of any approved reduction. Any dispute over the decision of the District Manager, or his or her designee, shall be referred to the Board. The decision of the San Joaquin County Mosquito and Vector Control District Board of Trustees shall be final.

## ASSESSMENT

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**WHEREAS**, the San Joaquin County Mosquito and Vector Control District Board of Trustees contracted with the undersigned Engineer of Work to prepare and file a report presenting an estimate of costs of Services, a diagram for the benefit assessment area, an assessment of the estimated costs of Services, and the special and general benefit conferred thereby upon all assessable parcels within the Mosquito, Vector and Disease Control Assessment;

**NOW THEREFORE**, the undersigned, by virtue of the power vested in me under Article XIID of the California Constitution, the Government Code and the Health and Safety Code and the order of the District Board of Trustees, hereby make the following determination of an assessment to cover the portion of the estimated cost of the Services, and the costs and expenses incidental thereto to be paid by the Mosquito, Vector and Disease Control Assessment.

The District has evaluated and estimated the costs of extending and providing the Services to the Assessment Area. The estimated costs are summarized in Figure 1 and detailed in Figure 5, below.

The amount to be paid for said Services and the expenses incidental thereto, to be paid by the San Joaquin County Mosquito and Vector Control District for the fiscal year 2018-19 is generally as follows:

**FIGURE 5 – SUMMARY COST ESTIMATE FISCAL YEAR 2018-19 BUDGET**

Vector Control and Disease Prevention Operations	\$5,353,764
Materials, Utilities and Supplies	\$2,956,860
Capital Equipment and Fixed Assets	\$862,550
Incidentals	\$48,381
<b>TOTAL BUDGET</b>	<b>\$9,221,555</b>
Less:	
District Contribution & Current Rev.	(\$7,156,234)
Transfers to (from) reserves	(\$11,676)
<b>Net Amount To Assessments</b>	<b>\$2,053,645</b>

An Assessment Diagram is hereto attached and made a part hereof showing the exterior boundaries of the Assessment Area. The distinctive number of each parcel or lot of land in the said Assessment area is its Assessor Parcel Number appearing on the Assessment Roll.

I do hereby determine and apportion the net amount of the cost and expenses of the Services, including the costs and expenses incidental thereto, upon the parcels and lots of land within said Mosquito, Vector and Disease Control Assessment, in accordance with the special benefits to be received by each parcel or lot, from the Services, and more particularly set forth in this Engineer's Report.

The assessment determination is made upon the parcels or lots of land within the assessment area in proportion to the special benefits to be received by the parcels or lots of land, from the Services.

The assessment is subject to an annual adjustment tied to the Consumer Price Index for the San Francisco Bay Area as of December of each succeeding year (the "CPI"), with a maximum annual CPI adjustment not to exceed 3%. Any change in the CPI in excess of 3% shall be cumulatively reserved as the "Unused CPI" and shall be used to increase the maximum authorized assessment rate in years in which the CPI is less than 3%. The maximum authorized assessment rate is equal to the maximum assessment rate in the first fiscal year the assessment was levied adjusted annually by the minimum of 1) 3% or 2) the change in the CPI plus any Unused CPI as described above.

The change in the CPI from December 2016 to December 2017 was 2.94% and the Unused CPI carried forward from the previous fiscal year is 0.70%. Therefore, the maximum authorized assessment rates for fiscal year 18-19 are increased by 3% which equates to \$9.72 for Zone A, \$9.24 for Zone B, and \$10.26 for Zone C, per single family equivalent benefit unit. The estimate of cost and budget in this Engineer's Report proposes assessments for fiscal year 18-19 at the following rates which are less than the maximum authorized assessment rates:

**ZONE A:** EIGHT DOLLARS AND EIGHTY-FOUR CENTS (\$8.84) per single family equivalent unit (SFE).

**ZONE B:** EIGHT DOLLARS AND FORTY CENTS (\$8.40) per single family equivalent unit (SFE).

**ZONE C:** NINE DOLLARS AND TWENTY-NINE CENTS (\$9.29) per single family equivalent unit (SFE).

Each parcel or lot of land is described in the Assessment Roll by reference to its parcel number as shown on the Assessor's Maps of the County of San Joaquin for the fiscal year 2018-19. For a more particular description of the property, reference is hereby made to the deeds and maps on file and of record in the office of the County Assessor of the County of San Joaquin.

I hereby place opposite the Assessor Parcel Number for each parcel or lot within the Assessment Roll, the proposed amount of the assessment for the fiscal year 2018-19 for each parcel or lot of land within the Mosquito, Vector and Disease Control Assessment District.

Dated: June 8, 2018

Engineer of Work

By \_\_\_\_\_  
John W. Bliss, License No. C52091

## **ASSESSMENT DIAGRAM**

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The Mosquito, Vector and Disease Control Assessment area includes all properties within the boundaries of the District.

The boundaries of the Mosquito, Vector and Disease Control Assessment Area are displayed on the following Assessment Diagram.

## **ASSESSMENT ROLL**

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Reference is hereby made to the Assessment Roll in and for the assessment proceedings on file in the office of the San Joaquin County Mosquito and Vector Control District, as the Assessment Roll is too voluminous to be bound with this Report.