



**SAN DIEGO COUNTY VECTOR CONTROL PROGRAM  
MOSQUITO, VECTOR AND DISEASE CONTROL ASSESSMENT**

**ENGINEER'S REPORT**  
FISCAL YEAR 2010-11

JULY 2010

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

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## INTRODUCTION

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### OVERVIEW

The San Diego County Vector Control Program (SDCVCP or Program) exists within the County of San Diego Department of Environmental Health (DEH). The SDCVCP is responsible for mosquito and vector-borne disease surveillance and control services in all 18 incorporated cities and the unincorporated areas of San Diego County. The SDCVCP has been reducing and controlling mosquitoes and other vectors and protecting against vector-borne diseases for over 30 years. It is managed by County staff and is governed by the San Diego County Board of Supervisors (Board).

The SDCVCP's core services include:

1. Early detection of public health threats through comprehensive vector surveillance.
2. Control and reduction of vectors and exposure to vectors that transmit diseases.
3. Disseminating public health information to provide property owners with empowering tools for active involvement in prevention, protection and reporting.
4. Appropriate, timely response to vector-related customer complaints.

Since 1989 funding for the VSCP program was primarily from a service charge levied against all parcels in the County. When Proposition 218 was passed in 1996 it froze the service charge at \$3.00 for the Coastal Region and \$2.28 for both Inland Regions. This service charge provided limited funding that was not sufficient for the level of mosquito, vector and disease control services desired. In 2005, a new benefit assessment for improved mosquito, vector and disease control services was approved by property owners within the County of San Diego. This new mosquito, vector and disease control assessment was first levied in fiscal year 2005-06 and has been levied annually thereafter. This Engineer's Report ("Report") defines the benefit assessment, which provides funding for the mosquito, vector and disease control services throughout the San Diego County (the "Assessment Area"). It also provides funding for necessary equipment, capital improvements, services, facilities and incidentals for mosquito and vector control programs that would be funded for fiscal year 2010-11.

### ASSESSMENT FORMATION

In order to allow property owners to ultimately decide whether funding should be provided for improved mosquito, vector and disease control services, 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"). In May and June of 2005, the SDCVCP conducted an assessment ballot proceeding pursuant to the

requirements of Article XIID 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 proposed benefit assessment. A 45-day period was provided for balloting and a public hearing to conclude the balloting period was conducted on June 22, 2005. The final balloting result was 61.46% weighted support from ballots returned. (Weighted support in excess of 50% is required for the establishment of a new benefit assessment.)

As a result of this support by property owners, the Board gained the authority to approve the levy of the assessments for fiscal year 2005-06 and future years. The Board took action, by Resolution No. 05-017 passed on July 13, 2005, to approve the first year levy of the assessments for fiscal year 2005-06. The authority granted by the ballot proceeding was for a first year assessment rate of \$8.55 per single family equivalent benefit unit, increased each subsequent year by the San Diego Area CPI (Consumer Price Index) not to exceed 5% per year.

#### **ASSESSMENT DESCRIPTION**

Prior to the Assessment, the SDCVCP provided a "baseline" level of mosquito, vector and rat surveillance services in the County. The services funded by the Assessment consist of expanded and improved services, as listed below, over and above the prior baseline level of services.

The Assessment Area, which is coterminous with the County boundaries, includes only those 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 SDCVCP, and that will 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 Area.

The following is an outline of the primary programs, projects, services and improvements (collectively "Services") that are funded by the Mosquito, Vector and Disease Control Assessment:

- Mosquito surveillance
- Mosquito control through treatment of mosquito breeding sources
- Public Education/Outreach through the media, presentations to schools and civic groups

- Emergency Response to disasters and recovery efforts; vector control and surveillance actions
- Provide direction for control and remediation of habitat or vegetation supporting mosquito breeding to property owners
- Distribute mosquito fish for backyard fish ponds and other appropriate habitats
- Rodent-borne and tick-borne disease surveillance
- Surveillance for emerging and historical vector-borne diseases
- Response to service requests and complaints regarding mosquito and fly breeding sources and the presence of rats
- Identification of mosquitoes, ticks and other arthropods for businesses and the public

As used within this Report, 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” means 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 SDCVCP operates under the authority of the Mosquito Abatement and Vector Control District Law of the State of California law. 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.*

### **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 XIIC and XIID 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 were

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 is consistent with the SVTA vs. SCCOSA decision and with the requirements of Article XIIC and XIID of the California Constitution because the Services to be funded are clearly defined; the Services are available to all benefiting property in the Assessment Area, the benefiting property in the Assessment Area will directly and tangibly

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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.”

benefit from reduced mosquito and vector populations, reduced risk of the presence of diseases, increased safety of property and other special benefits; and such special benefits provide a direct advantage to property in the Assessment Area that is not enjoyed by the public at large or other property. 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 4<sup>th</sup> 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 on the rationale that the services and improvements funded by the assessments were directly provided to property in the assessment district.

#### **ASSESSMENT CONTINUATION**

In each subsequent year for which the assessments will be levied, an Engineer's Report must be prepared to establish the Services to be funded by the Assessments for the fiscal year, to determine the assessments for each parcel in the Assessment Area and to make other findings. After the Report has been prepared, it will be reviewed by the Board and a public hearing will be held. A notice of the intent to continue the assessments for the next fiscal year and the date when the Board will hold the public hearing will be published in a local newspaper. 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. After the conclusion of the public hearing, the Board may take action, by resolution, to approve the Report and the levy of the assessments for the upcoming fiscal year. If the Board approves the continuation of the assessments, they will be included and collected with tax bills.

This Report was prepared by SCI Consulting Group ("SCI") to describe the Services to be funded by the benefit assessment for fiscal year 2010-11, 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 Assessment Area based on the estimated special benefit each parcel receives from the Services funded by the benefit assessment.

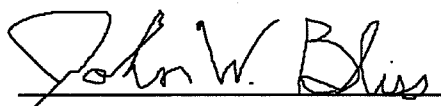
Since the initial Single Family Equivalent assessment rate of \$8.55 in 2005, the rate has been reduced to the current proposed rate of \$6.20. The fiscal year 2010-11 budget includes outlays for West Nile Virus Emergency Response activities, WNV prevention

education, surveillance and mosquito control, habitat remediation, capital equipment, supplies, vector-borne disease testing programs and vector control programs.

**CERTIFICATES**

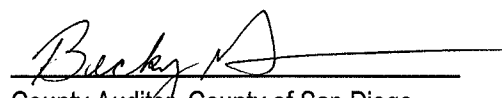
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1. The undersigned respectfully submits the enclosed Engineer's Report and does hereby certify that this Engineer's Report, and the Assessment and Assessment Diagram herein, have been prepared by me.

  
Engineer of Work, License No. C52091

2. I, the County Auditor of the County of San Diego, California, hereby certify that Assessment Roll and Assessment Diagram for fiscal year 2010-11 were filed with me on

July 21, 2010.

  
County Auditor, County of San Diego

## **GENERAL DESCRIPTION OF THE PROGRAM AND PROPOSED SERVICES**

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### **ABOUT THE VECTOR CONTROL PROGRAM**

The SDCVCP operates within DEH and monitors disease-carrying insects such as mosquitoes, ticks and other harmful pests such as flies and rats. The SDCVCP reduces mosquito and other harmful vector populations through the control and abatement of mosquito breeding sources. In addition, the SDCVCP provides property inspections and advice for the control of domestic rats, flies and other pests for properties throughout the Assessment Area. The SDCVCP also conducts surveys and tests for diseases carried by insects and small mammals. Public education is another component of the SDCVCP to increase prevention and protection against disease-carrying vectors such as mosquitoes, the vectors for WNV.

As mentioned earlier, the SDCVCP provided a "baseline" level of services in the County as permitted with the limited funding available prior the Assessment. The Assessment provides the additional funding to improve mosquito, vector and disease control services for all properties in the Assessment Area and such Services are over and above the baseline level of services that would be provided in absence of the Assessment.

### **DESCRIPTION OF THE VECTOR CONTROL PROGRAM**

This year, the SDCVCP provided property owners services and protection from the continuous impact of WNV infection. Only two locally acquired human cases of WNV were reported in 2009. Compared to the previous year in which 35 human cases were locally acquired, there has been a drastic decrease in human infections within the County. Since the introduction of WNV in San Diego County, there have been no fatalities.

In addition to being nuisances by disrupting human activities and the use and enjoyment of property, certain insects and animals may transmit a number of diseases. The diseases of most concern are: West Nile Virus (WNV), Western Equine Encephalitis (WEE), Saint Louis Encephalitis (SLE), and malaria, which are all transmitted by mosquitoes; plague, transmitted by fleas; Hantavirus Pulmonary Syndrome (HPS), transmitted by certain species of wild mice; and tick-borne diseases including Lyme disease and tularemia.

The spread of these diseases and the impact that vectors have on property is minimized through ongoing vector surveillance activities, source reduction, source treatment, abatement, and educational outreach. These efforts also minimize the nuisance impact that vectors can have on property and residents. To fulfill this purpose, the SDCVCP may

take any and all necessary steps to control mosquitoes, monitor other vectors, and perform other related vector control services.

Currently, the SDCVCP provides vector control and disease surveillance services as well as general public information. These services are further defined as follows:

- Responds to mosquito problems as well as other pestiferous or disease carrying organisms on property in the Assessment Area.
- Reduces mosquito populations by the application of larvicide to control mosquito larvae via helicopter, boat, blowers and by hand to property in the Assessment Area.
- Prepares to apply mosquito adulticides in the event of a declared public health emergency to control adult mosquito populations as determined by the Director of Environmental Health and the Public Health Officer.
- Participates in emergency response and recovery vector surveillance and control activities within the Assessment Area.
- Monitors adult mosquito population abundance using carbon dioxide baited traps, and Reiter Gravid traps to assess public health risks and allocate control efforts  
Collects and tests mosquito specimen "batches" for mosquito-transmitted diseases such as WNV, SLE, and WEE.
- Monitors for new and emerging vectors such as the Asian Tiger mosquito and emerging pathogens.
- Maintains sentinel chicken flocks for analytical blood studies for State and local public health agencies.
- Conducts searches for neglected green swimming pools on property in the Assessment Area to identify and stop mosquito breeding occurring in backyard sources.
- Assists property owners in the control of rats through onsite inspection and advice, the provision of a rat control starter kit and public education.
- Monitors hantavirus-bearing rodents, such as deer mice, through trapping and testing on property in the Assessment Area.
- Surveys and identifies arthropod-borne diseases such as Lyme disease and plague found in parks, campgrounds, on trails and other locations.
- Conducts a twice yearly trapping program for rats in ports of entry to test for the presence of plague.
- Educates property owners about the risks of diseases carried by mosquitoes, flies, insects, and small mammals, and emphasizes personal protection as well as individual responsibility by providing educational programs on vectors and disease abatement at schools, civic group meetings and community events

- Develops and distributes printed material and brochures that describe what County residents, employees and property owners in the Assessment Area can do to protect themselves from disease and keep their homes and property free of mosquitoes and other vectors
- Maintains Program websites (SDFightTheBite.com and SDVector.com) with WNV activity, hantavirus activity, aerial larvicide application schedule, fish distribution locations, press releases and any other pertinent information in relation to the protection of public health in San Diego County
- Develops innovative methods to distribute public health information, such as the use of Facebook (<http://www.facebook.com/pages/San-Diego-CA/County-of-San-Diego-Environmental-Health/71479891529>).

The SDCVCP protects the public from vector-borne disease and mosquito nuisance while protecting the environment, through a coordinated set of activities collectively known as the Integrated Vector Management Program (IVMP). For all vectors, public education is the primary control strategy. Next, the SDCVCP determines the abundance of vectors and the risk of vector-borne disease or discomfort through evaluation of public service requests and field and laboratory surveillance activities. If the populations exceed or are anticipated to exceed the public threshold of tolerance, the SDCVCP will employ the most efficient, effective and environmentally sensitive means of source control.

**FIGURE 1 – SUMMARY OF SERVICES AND PERFORMANCE MEASURES**

CORE FUNCTION	PERFORMANCE MEASURE
Early detection of public health threats through comprehensive vector surveillance.	<p><b>Appropriate levels of surveillance for early detection of disease</b></p> <ul style="list-style-type: none"> <li>▪ Set 10 Gravid Traps per week for mosquito surveillance</li> <li>▪ Set 70 CO2 traps for mosquito surveillance</li> <li>▪ Test for Hantavirus 36 times during the year</li> <li>▪ Test for plague at high and low elevations weekly (March – November)</li> <li>▪ Test for plague at Ports-of-Entry twice yearly</li> <li>▪ Conduct tick surveillance twice weekly, November through March, for the presence of Lyme and Tularemia disease.</li> </ul>
Protect public health by reducing vectors or exposure to vectors that transmit diseases to humans.	<p><b>Work with Cities and Agencies who are owners of mosquito breeding sources</b></p> <ul style="list-style-type: none"> <li>▪ Evaluate, modify and/or eliminate mosquito breeding habitat through the Habitat Remediation Plan funding</li> <li>▪ A target implementation date of January 2010 for acceptance of applications for project funding</li> </ul> <p><b>Rodent borne disease</b></p> <ul style="list-style-type: none"> <li>▪ Treat rodent burrows where plague is detected to eliminate fleas and stop spread of disease</li> <li>▪ Provide guidance to property owners in eradicating mice and removing contaminants from buildings where Hantavirus is found</li> </ul> <p><b>Protect the environment by using least toxic and least invasive means for mosquito control in sensitive habitats</b></p> <ul style="list-style-type: none"> <li>▪ Training and guidelines for Vector staff</li> <li>▪ Ongoing review of emerging technologies and control methods</li> <li>▪ Work closely with wildlife and MSCP agencies to implement the Habitat Remediation Plan</li> </ul>

Disseminating public health information to provide property owners with empowering tools for active involvement in prevention, protection and reporting	<p><b>Increase awareness of vector borne disease prevention and control</b></p> <ul style="list-style-type: none"> <li>▪ Conduct 12 Outreach presentations to primary and/or secondary school classrooms/events, or approximately 1000 students</li> <li>▪ Develop informative press releases when disease is detected</li> <li>▪ Distribute 50,000 educational materials annually</li> <li>▪ Develop a WNV prevention media campaign</li> </ul>
Prevent and control vector-borne diseases through timely response to complaints	<ul style="list-style-type: none"> <li>▪ Review manure management plans annually for active facilities</li> <li>▪ Inspect poultry ranches quarterly</li> <li>▪ Target a 2-day contact and 5 day field response time for complaints</li> <li>▪ Resolve 98% of complex complaints (those involving additional agencies or departments) within 20 days</li> </ul>

## THE WEST NILE VIRUS STRATEGIC RESPONSE PLAN

The purpose of the WNV Strategic Response Plan (WNVSRP or Plan) is to implement an integrated, risk-based response designed to promote safe and livable communities as well as educate and involve County agencies and property owners in the year-round effort to control mosquito breeding and minimize environmental and economic impacts associated with WNV.

The WNV Strategic Response Plan is based on conditions established by the California Department of Health Services (CDHS), California Mosquito-borne Virus Response Plan and the Centers for Disease Control (CDC). In 2003, the Board of Supervisors adopted the WNVSRP to establish an organized and planned response to the virus within the county. The Plan was updated in 2004 to address the potential emergency use of adulticides if deemed necessary. This Plan was used extensively in 2007 with the introduction of WNV into the human population.

In summer of 2008, the SDCVCP increased its level of response consistent with the WNVSRP. This heightened level of response was due to an increasing number of WNV positive dead birds, mosquito batches and the occurrence of human infections. The SDCVCP increased surveillance and control efforts in response. This included helicopter flyovers looking for neglected green swimming pools and stagnant water as well as door-to-door inspections for mosquito breeding sources in the neighborhoods of human cases. Small breeding sources such as watering cans, pooling irrigation water (overspray), or decorative water features were identified in yards throughout the County.

The SDCVCP stepped up the WNV outreach campaign by sending letters to banks about foreclosed properties with neglected green swimming pools that can become mosquito breeding sources. In addition to new efforts, the Program continued to educate the public by attending health fairs, giving presentations and distributing educational materials. "Health Alert" letters were also sent to businesses and property owners about the presence of WNV in neighborhoods.

A review of the WNV Strategic Response Plan and its implementation has been conducted by the SDCVCP. The knowledge gained from the previous year aids in the implementation of the WNVSRP for the following year. This new information is crucial for adapting to changing environmental conditions within the County. These environmental conditions may include previously unidentified breeding sources for mosquitoes such as neglected green swimming pools.

## MOSQUITO-BORNE DISEASES SURVEILLANCE

Of the world's three thousand mosquito species, more than 50 live in California, and 24 have been identified in San Diego County. Certain species of mosquitoes found in San Diego County can transmit diseases such as malaria, SLE, WEE and WNV. SDCVCP conducts surveillance and testing of mosquitoes that could transmit these diseases. In 2009, WNV was the only disease detected through this surveillance.

The SDCVCP has found mosquito and other potential vector sources scattered throughout the SDCVCP. All properties within the Assessment Area 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 Assessment Area has long suffered from mosquitoes and other vectors and includes a large number of sources.

In addition to transmitting pathogenic disease, mosquitoes can cause significant impacts to farm workers and other outdoor workers, to outdoor recreation and tourism industries, to real estate values, and the public in general. Mosquitoes are therefore recognized as a public nuisance. The California legislature has found that the protection of "Californians and their communities against the discomforts and economic effects of vector-borne diseases is an essential public service that is vital to public health, safety and welfare." (Health and Safety Code section 2001 (b)(3).

The progression of WNV in San Diego County began in 2003 when the virus was first discovered within the County. The first confirmed locally acquired human case of WNV was in 2006. In 2007, 15 locally acquired human infections were reported; 14 of these infections occurred in persons over the age of 50. During 2008, 35 people were infected with WNV in the County of San Diego; 21 of these people were over the age of 50. A few infections occurred in young children. By 2009, the numbers dropped significantly to only four cases with two acquired locally. Fortunately, there have been no mortalities in the County as a result of WNV.

Figure 2 tracks the number of WNV positive human cases for Southern California counties from 2006 to 2009. As can be seen, the number of cases has decreased from 2008 levels in all areas of Southern California.

**FIGURE 2 – HWN CASES IN SOUTHERN CALIFORNIA IN 2009**

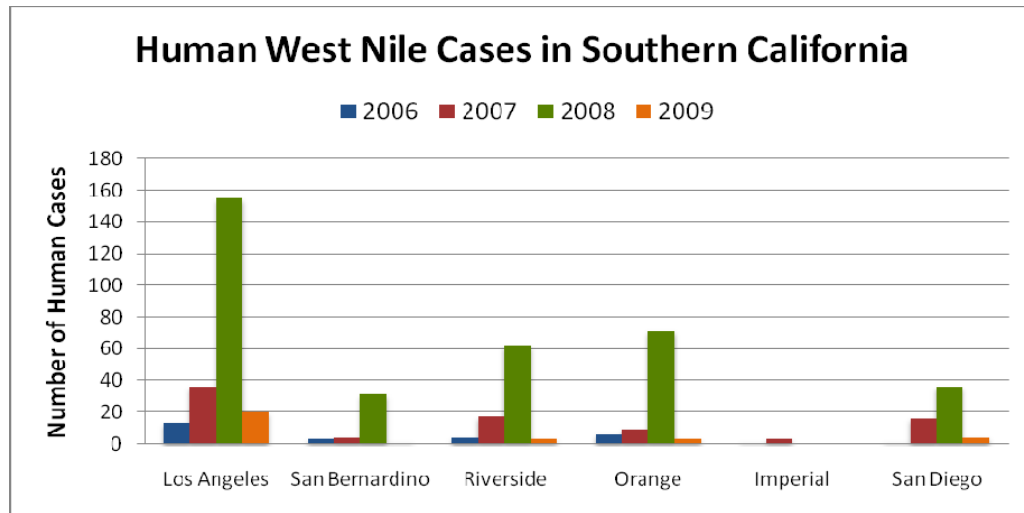
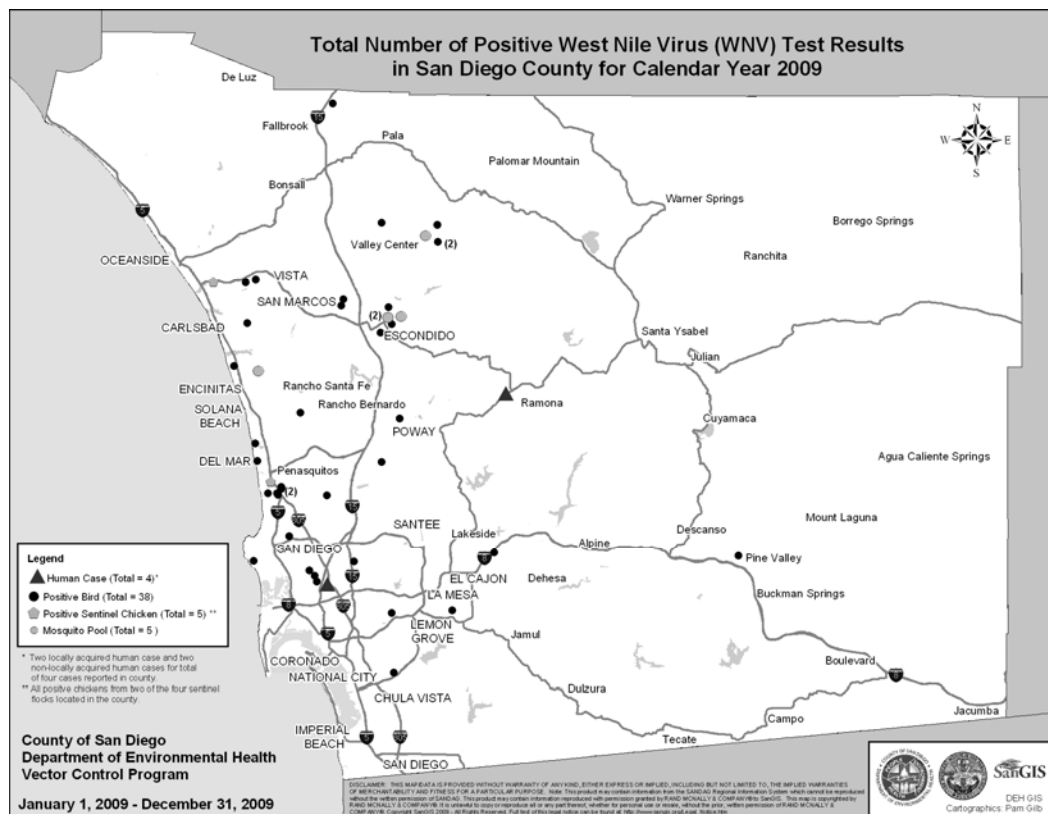


Figure 3 below summarize the positive results found in San Diego County through all 2009 surveillance activities.

**FIGURE 3 – WEST NILE VIRUS POSITIVE SURVEILLANCE IN 2009**



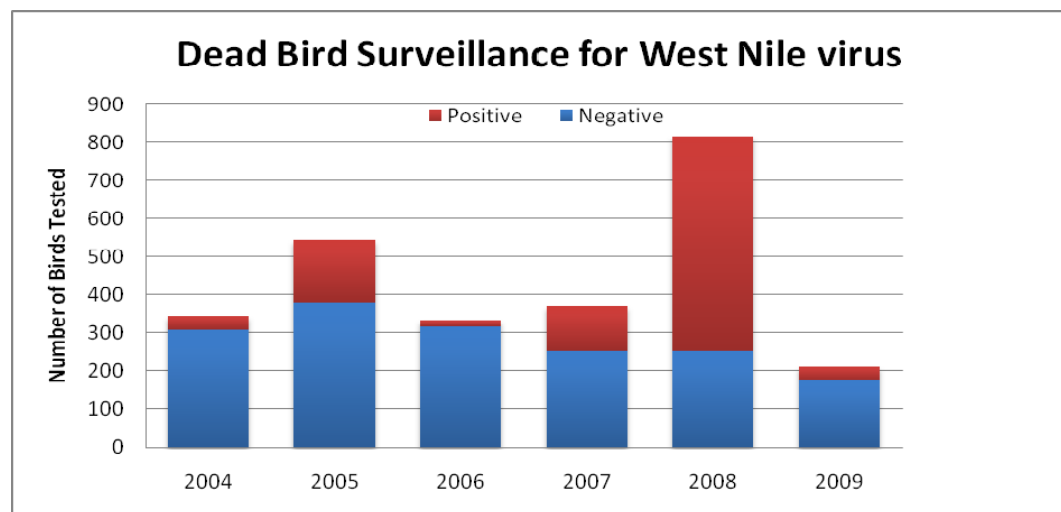
SOURCE OF POSITIVE RESULTS	NUMBER POSITIVE FOR WNV
HUMAN ILLNESS	4 (2 LOCALLY ACQUIRED)
DEAD WILD BIRDS	38

SOURCE OF POSITIVE RESULTS	NUMBER POSITIVE FOR WNV
SENTINAL CHICKENS	5
MOSQUITO POOLS	5
HORSES	0

#### DEAD BIRD TESTING

Dead bird testing is a valuable surveillance tool in the detection of WNV in the County and State. The SDCVCP requests that County property owners report dead crows, ravens, jays, hawks and owls. These WNV-susceptible birds are taken to the County Animal Disease Diagnostic Laboratory (ADDL) for testing. Laboratory staff tests for the presence of WNV in the fluid in the birds' eyes. Previous research conducted in 2008 greatly reduced processing time from 10-20 minutes to less than 1-2 minutes per bird. This method has now been validated and adopted by the State of California. Figure 4 below demonstrates the level of dead bird testing done since 2004.

**FIGURE 4 – DEAD BIRD TESTING**



In 2009, 38 of the 213 total collected dead birds tested positive for WNV. SDCVCP vector ecologists contacted all persons submitting WNV positive birds. The SDCVCP investigated and treated any mosquito breeding discovered near the locations where the birds were found. By identifying concentrations of positive dead birds in the county, the SDCVCP was able to focus its surveillance and control efforts in the areas of the County which were most affected.

#### SENTINEL CHICKENS

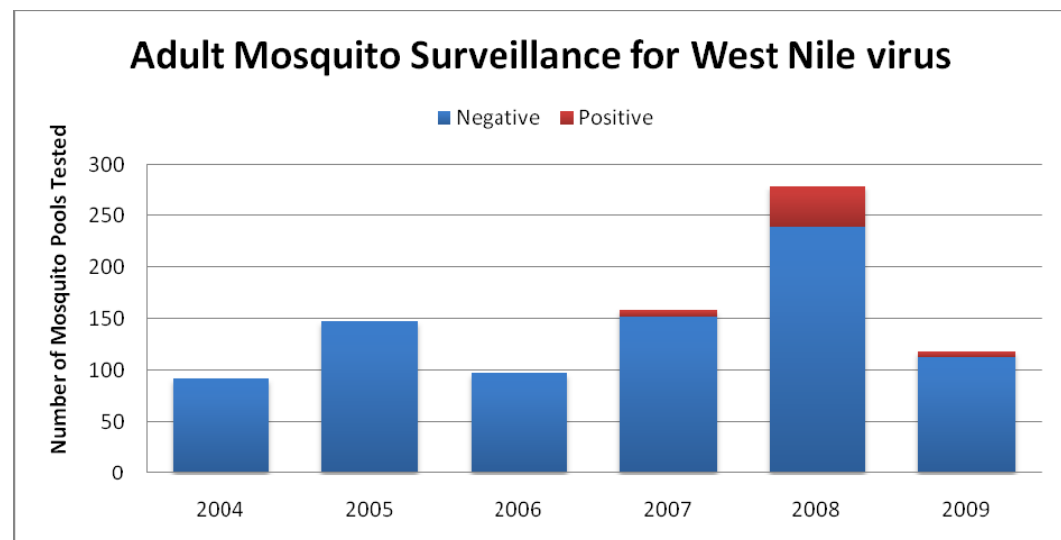
Sentinel chicken testing has been shown to be an effective early detection technique for WNV. In 2009, the SDCVCP maintained four flocks of sentinel chickens, strategically

placed throughout the County. Each flock consisted of 10 chickens. Sentinel chicken flocks were located at Buena Vista Lagoon, Santee, Peñasquitos Lagoon and the Tijuana River area. These chickens were tested for WNV every other week throughout the season which normally runs from April through November. In 2003, two chickens tested positive for WEE in the flock near Buena Vista Lagoon. In 2006, no San Diego County sentinel chickens tested positive for WNV, WEE, or SLE. In 2008, the entire flock at Peñasquitos lagoon tested positive for WNV by mid summer. In total, the flock at Buena Vista Lagoon had four positives and the flock in the Tijuana River area had one positive for WNV in 2008. By 2009, only three chickens from the Sorrento flock and two from the Oceanside flock tested positive for WNV. No sentinels tested positive at the sites in Santee and Tijuana River in 2009. Neither WEE nor SLE were detected in any sentinel chicken in 2009.

#### COUNTING MOSQUITO BATCHES

Prior to the impact of WNV on humans, the SDCVCP had been testing approximately 100 mosquito batches per season, depending on the mosquito population. As standard procedure, testing increases beyond this baseline as a response to positive human cases. In 2009, the number of WNV human cases dropped dramatically from the previous year. This reduction in cases allowed for reduced adult mosquito testing. The figure below illustrates the numbers of adult mosquito batches tested since 2004.

**FIGURE 5 – TRAPPING AND TESTING OF ADULT MOSQUITOES**



Surveillance is conducted in a manner based upon an equal spread of resources throughout the SCDVCP 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.

Surveillance devices called gravid traps are used for the collection of female mosquitoes searching for a place to lay their eggs. The traps are located and spread throughout the SDCVCP in a balanced approach such that the traps measure mosquito levels throughout the SDCVCP. These mosquitoes have already taken a blood meal and are a good indicator of WNV infection levels in birds. In 2007, the use of gravid traps was increased to several times per week during the peak of the mosquito season. A few of these collections did test positive for WNV. By 2008, the use of gravid traps had become one of the primary investigative tools for urban areas. They are especially useful for finding mosquito breeding sources of infected mosquitoes during a WNV positive human investigation.

#### AERIAL SURVEILLANCE

Abandoned homes with neglected green swimming pools and ponds support significant mosquito breeding in residential neighborhoods. In an effort to locate these previously unidentified breeding sites, the SDCVCP conducts aerial surveillance with the San Diego County Sheriff's helicopter. This aerial surveillance focuses on areas which had been most affected by home foreclosures. Once neglected pools and ponds are identified and mapped, the SDCVCP inspects and treats these locations. In 2009, 1,541 green pools were identified by helicopter.

#### POSITIVE CASE NOTIFICATION

The SDCVCP notifies businesses and households within a half mile radius of where people, and mosquito batches that have tested positive for the WNV are located in an effort to raise awareness. This notification is completed at the household and business level, though door-to-door canvassing. The Program also asks property owners to investigate possible back yard sources of mosquitoes that breed in standing water such as buckets, tires, ponds, children's toys and green pools. In 2009, two people and five mosquito batches tested positive for WNV resulting in a number of door-to-door neighborhood notifications.

### **MOSQUITO CONTROL**

When a mosquito source produces mosquitoes above the SDCVCP treatment thresholds, the Program will generally work with the landowner or responsible agency to reduce the habitat value of the site for mosquito (physical control). If this is ineffective, then the Technician will determine the best method of further treatment, including biological control and/ or chemical control. To control mosquitoes, the SDCVCP conducts inspections and identifies mosquito breeding sources. The sources include privately and publicly held lands

with rivers, streams, marshlands, lagoons, ponds, and various other human-made and natural sources of standing water. Land ownership of mosquito breeding sources has been identified using Geographic Information Systems (GIS). This has enabled the SDCVCP to educate property owners regarding their responsibility in managing standing water. Known mosquito breeding sources are evaluated during the winter months to confirm location and design treatment plans for these sources. This off-season effort creates routes for seasonal workers, who then treat locations during the mosquito breeding season.

In order to achieve the County's goal of reducing or eliminating mosquito breeding locations countywide, the SDCVCP first seeks voluntary compliance. In the event that voluntary compliance cannot be attained, the SDCVCP will work with property owners, public agencies and municipalities to ensure appropriate abatement and remediation is taken to protect public health. Formal enforcement action is pursued if voluntary compliance is not achieved.

The SDCVCP's objective is to provide the properties a "Program-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 Program-wide basis. The SDCVCP, 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 SDCVCP.

The County of San Diego also encourages cooperative efforts with other government agencies to reach a common goal. A joint courtesy inspection was done in the summer of 2009 with Camp Pendleton Marine base staff of base facilities and housing. This inspection revealed a number of breeding areas on the base which generate mosquitoes that can travel off the base into residential areas in the Assessment Area.

#### PHYSICAL CONTROL

The SDCVCP directs and assists the property owner to manage mosquito habitat areas ("breeding sites") to reduce mosquito production within the SDCVCP. The physical control method primarily targets mosquitoes in their larval stage. This may include the removal of vegetation or sediment, interruption of water flow, rotation of stored water, pumping and/or filling sources, improving drainage and water circulation systems, and installing, improving, or removing culverts, tide gates, and other water control structures in wetlands. The SDCVCP directs the property owner to coordinate water management efforts under the guidance of federal and state regulatory agencies.

## MOSQUITO BIOLOGICAL CONTROLS

The mosquito fish, *Gambusia affinis*, is the SDCVCP's primary biological control agent used against mosquitoes. Mosquito fish are not native to California, but have been widely established in the state since the early 1920's, and now inhabit most natural and constructed water bodies. The SDCVCP maintains a population of mosquito fish in large tanks and purchases them from breeders when necessary. The SDCVCP also periodically uses nets and traps to collect mosquito fish from natural water bodies located in the Assessment Area. During the mosquito breeding season, April through October, mosquito fish are made available to property owners to control mosquito production only in artificial containers such as ornamental fishponds, water plant barrels, horse troughs, and neglected green swimming pools within the SDCVCP. The fish are available for free to the property owners at several distribution sites throughout the Assessment Area. These locations are published on the [SDFightTheBite.com](http://SDFightTheBite.com) website.

In an effort to meet the public demand for mosquito fish, the SDCVCP has constructed a new fish rearing facility in San Pasqual. This facility was previously used by the City of San Diego for a water reclamation project. The project was deemed not cost effective for water reclamation and the facility had remained vacant. In 2009, the SDCVCP rented the pond from the City of San Diego and filled it with water and approximately 20,000 wild caught *G. affinis*. The fish reared in 2009 will be used for the 2010 mosquito season.

Many mosquito-breeding sources cannot be adequately controlled with physical control measures or mosquito fish, so the SDCVCP also uses natural biological materials and/or insecticides approved by the Federal Environmental Protection Agency, California Environmental Protection Agency and other environmental agencies to control mosquito populations. When field inspections determine the presence of mosquito populations which meet the SDCVCP criteria for control (including presence of disease, abundance, density, species composition, proximity to human settlements, water temperature, presence of predators, and others), the SDCVCP staff will apply these materials to the site in strict accordance with the label instructions. The primary types of materials used against mosquitoes are selective larvicides.

Depending on time of year, water temperature, organic content, mosquito species present, larval density, and other variables, larvicide applications may be repeated at continual intervals ranging from weekly to annually. Larvicides routinely used by the SDCVCP include *Bacillus thuringiensis israelensis* (BTI) and *Bacillus sphaericus* (BS), as well as Golden Bear Oil 1111 and Methoprene (Altosid).

## **AERIAL MOSQUITO LARVICIDE APPLICATION**

Beginning in 2004, the SDCVCP began an aerial mosquito larvicide application program. Aerial application of mosquito larvicide is the best method of application in inaccessible areas. There are three criteria that need to be met before a site could be considered a candidate for aerial application:

- Breeding site must be a proven mosquito breeding location
- Breeding site must be inaccessible to treat with conventional means
- Breeding site must be adjacent to a significant “at risk” human population

There are a number of wet, marshy areas and ponds that have thick stands of cattails and other vegetation within the Assessment Area. These are prime locations for aerial applications. The SDCVCP contracts with a helicopter application service to apply bacterial larvicides to the vegetation in the water bodies where the mosquito larvae grow. Larvicides are made from bacteria that, when applied in accordance with the manufacturer’s label, are very specific to mosquito larvae and will not harm other wildlife. This results in the efficient elimination of larvae before they can develop into biting adults. Larvicides were applied monthly to mosquito breeding locations from April through November in 2009. These control efforts reduced the risk of WNV in the Assessment Area as well as nuisance biting mosquitoes.

### **ADULT MOSQUITO CONTROL**

Adult mosquito control is a component of the WNV Strategic Response Plan. If large numbers of WNV infected adult mosquitoes are present and public health is threatened, the SDCVCP may use non-selective, low persistence aerosol pesticide to control adult mosquitoes. Pesticide/Adulticide application(s) must be approved by both the Director of the Department of Environmental Health and the Public Health Officer.

## **PUBLIC EDUCATION/OUTREACH**

### **GENERAL SUMMARY**

The goal of the SDCVCP public education and outreach is to educate people within the SDCVCP about vectors and vector-borne diseases within the County. To achieve this goal, a number of methods are implemented. These include, but are not limited to, the physical and electronic distribution of educational materials in both English and Spanish, the implementation of an education campaign aimed at prevention and education rather than reaction and alarm, the creation of proactive press releases and media contact, and the establishment of the County of San Diego as the local resource regarding vector-borne diseases. Two web sites have been developed to assist the community by providing

information and becoming a resource where property owners can go to report concerns and request services: [SDVector.com](http://SDVector.com) and [SDFightTheBite.com](http://SDFightTheBite.com)

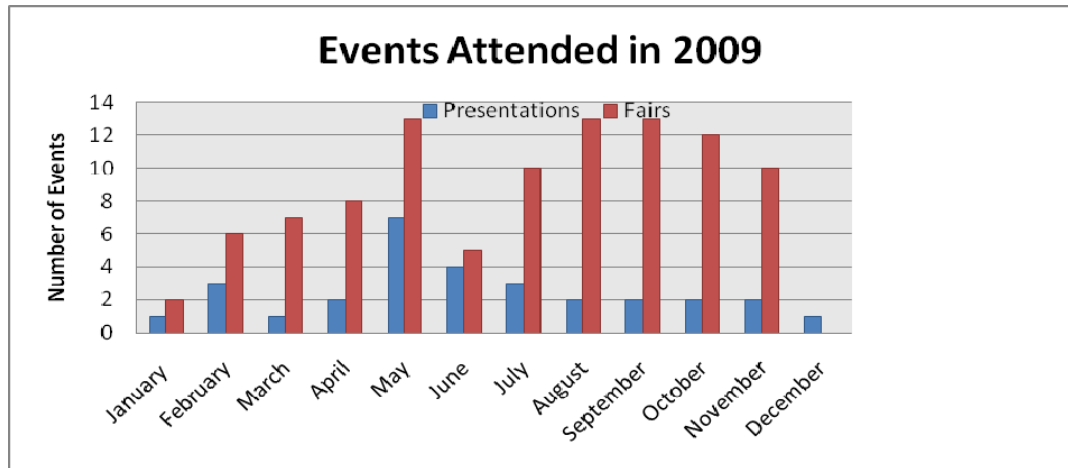
Health education, outreach, and raising awareness in the Assessment Area are all integral parts of the WNVSRP. An aggressive proactive approach is used in educating people within the SDCVCP about the risks of WNV and the preventive measures they can take to protect themselves and their communities. Strategies included conducting educational presentations to high-risk target groups such as seniors, migrant farm workers and the Spanish speaking community, staffing informational displays at health expositions and street fairs, and collaborating with different County and City departments and organizations.

The same aggressively proactive approach that is used for the WNV outreach campaign is used towards rats, hantavirus, and plague. Presentations, tabletop displays, and pamphlets are used and distributed to people within the SDCVCP addressing all four topics. Rural locations throughout the Assessment Area are targeted for hantavirus and plague education. Rat control starter kits are provided to property owners during site consultations. These clearly-labeled kits are used to publicize the SDCVCP rat services and come equipped with information that focuses on exclusion, baiting, and trapping.

#### FAIRS AND PRESENTATIONS

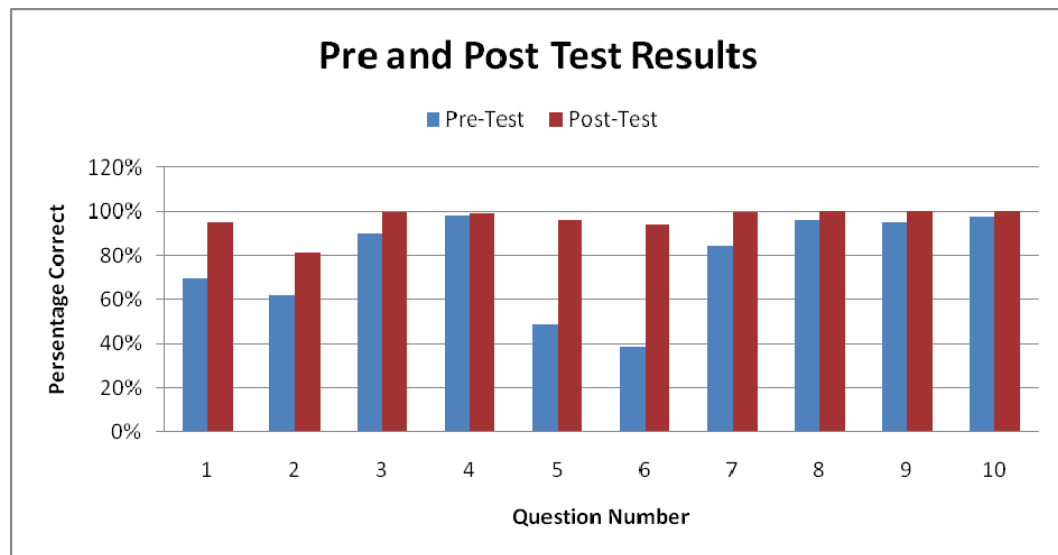
In 2009, the SDCVCP attended 99 fairs and gave 27 presentations throughout the County to address WNV and other vector-borne diseases. Of these, 15 fairs were attended and one presentation was conducted where the majority of attendees were children, to reach over 10,000 students under the age of 18.

**FIGURE 6 – OUTREACH EVENTS ATTENDED**



In an effort to measure behavior modification, the Program conducted pre and post tests before and after WNV presentations. Figure 7 below shows the percentage of correct answers for each question asked. San Diego County property owners seem to have a general understanding about the SDCVCP before they are given an informational presentation. It is questions specific to WNV prior to the presentation where knowledge is lacking (Question 5: Do both male and female mosquitoes transmit and spread WNV? Question 6: What is the most common symptom of WNV infection?). This type of evaluation tool gives the SDCVCP immediate feedback and allows the Program to further focus its efforts.

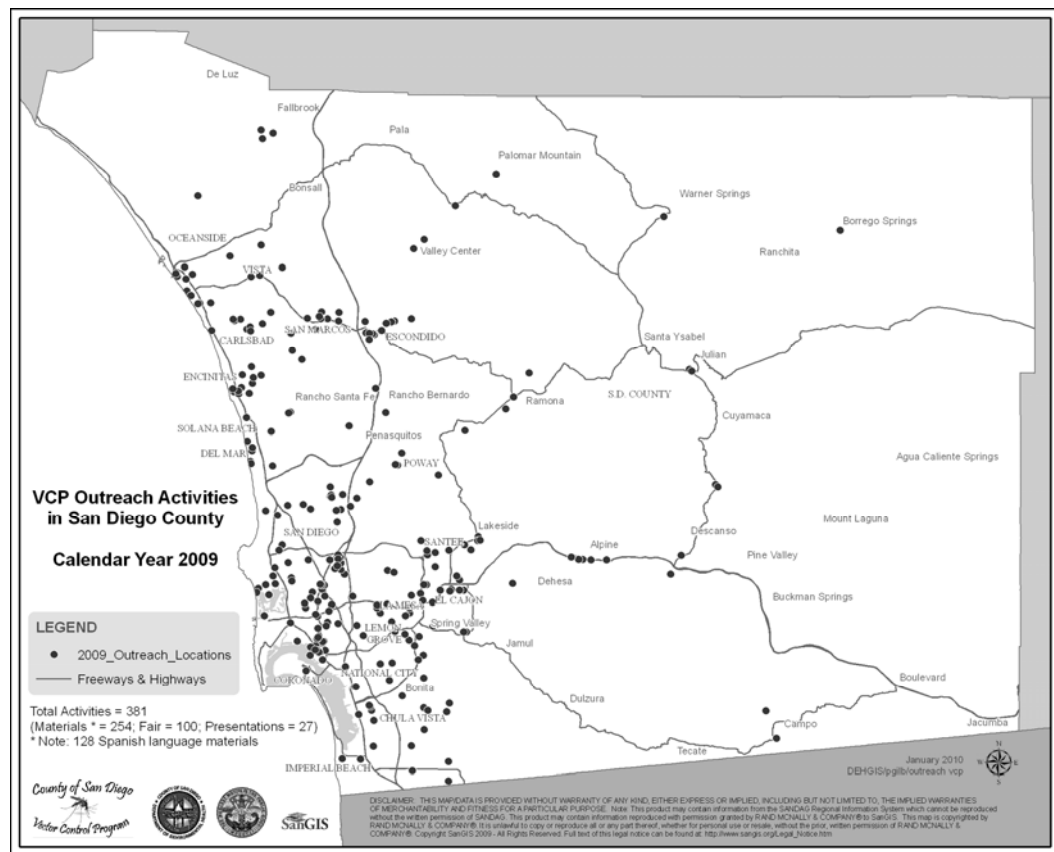
**FIGURE 7 – PRE AND POST TEST RESULTS**



EDUCATION MATERIALS

The SDCVCP distributes a number of educational materials that include a dual English/Spanish WNV DVD, English & Spanish WNV pamphlets and bookmarks, WNV magnets, mosquito pamphlets and cards, and English and Spanish dead bird reporting cards. These materials are used to increase the visibility of the SDCVCP and as a way to reach a larger audience. In addition, WNV activity books, WNV temporary tattoos and stickers are distributed with the specific goal of educating children. In 2009, the outreach program distributed over 100,000 education WNV materials along with other vector-borne disease materials. Materials were distributed to 254 institutions by request. These locations included public libraries, public health centers, County public counters, homeless shelters, WIC offices, City Halls, and schools.

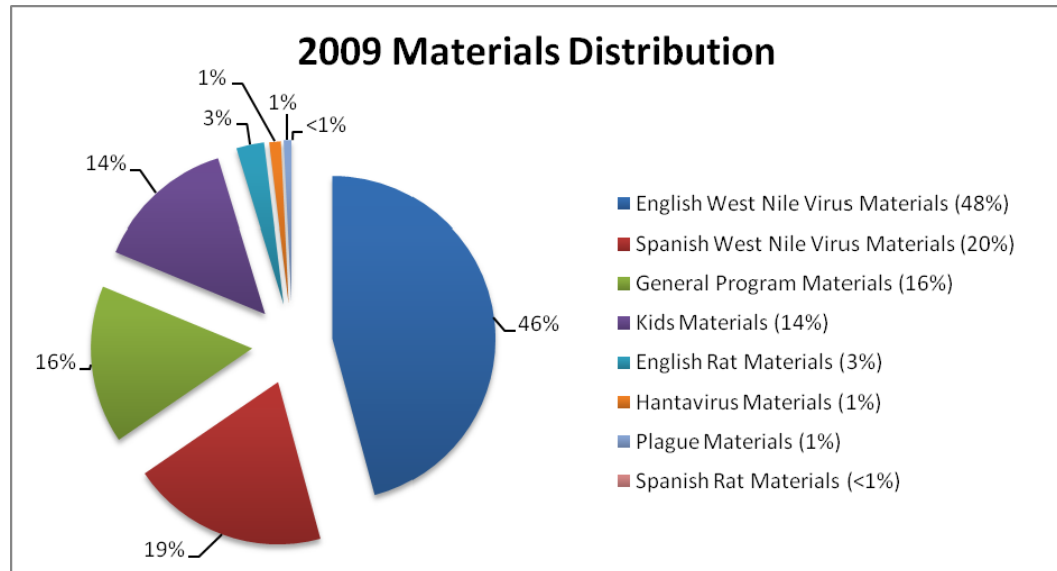
**FIGURE 8 – PERCENTAGE OF HOUSEHOLDS REACHED**



In addition to materials distribution, approximately 10,500 “Health Alert” letters were sent directly to County residents, employees and property owners within half a mile of a positively diagnosed WNV case. Positive cases included humans, horses, mosquito pools,

and sentinel chicken flocks. Letters were also sent to banks regarding over 600 foreclosed properties with swimming pools in an effort to raise awareness about neglected pools breeding countless mosquitoes.

**FIGURE 9 – 2009 MATERIAL DISTRIBUTED**



#### SOCIAL MEDIA

The SDCVCP further developed and improved the County's WNV website (SDFightTheBite.com) providing valuable up-to-date information to property owners about personal protection and elimination of mosquito breeding sites around their properties. In addition, information about WNV activity in the Assessment Area, regardless of whether the positive case was human, bird, horse, sentinel chicken, or mosquito batch, was constantly updated. The Program also utilized press releases, press conferences and media events to help deliver WNV prevention information. The SDCVCP homepage (SDVector.com) was also renovated to complement the WNV website in an effort to create a more user friendly format.

2009 marked the first year that DEH began utilizing Facebook (<http://www.facebook.com/pages/San-Diego-CA/County-of-San-Diego-Environmental-Health/71479891529>), a global social networking website. The SDCVCP contributes by posting current press releases, pictures, and videos relating to the Program in an effort to reach out to all San Diego County property owners.

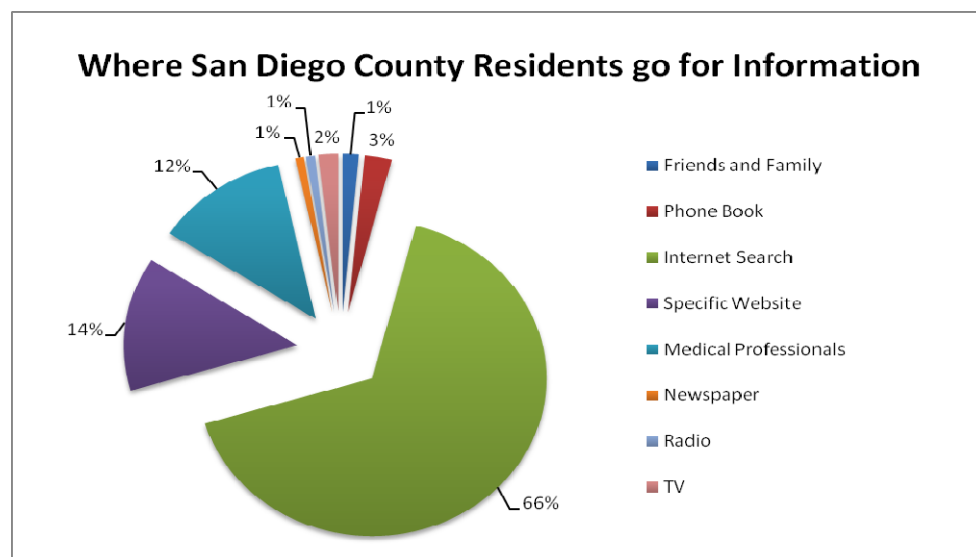
**MEDIA CAMPAIGN**

In 2009, a total of 16 press releases on all vector related issues including WNV, hantavirus, and plague were distributed to participating television and radio stations. Each news release contained educational information and references needed to effectively advertise the public service announcements.

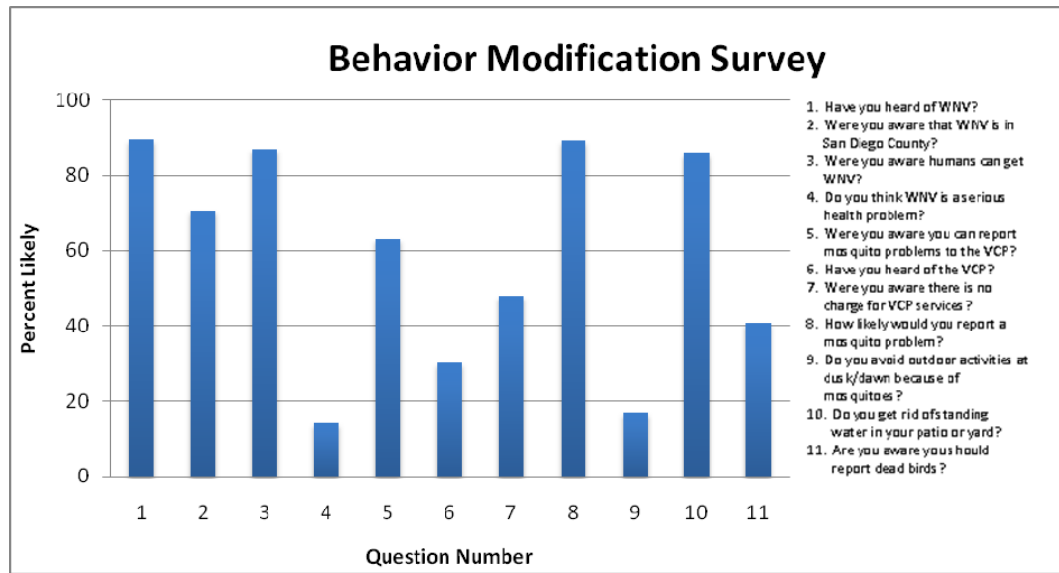
Additionally, the SDCVCP entered into a contract with a marketing consulting firm. The intent of this contract was to improve the Program's WNV outreach campaign by creating more effective outreach materials and targeting vulnerable populations. As part of the first phase of this contract, they conducted a randomized telephone survey of 404 San Diego County property owners. Property owners were asked about their knowledge and attitudes towards WNV and their awareness of the SDCVCP's services.

In the following two graphs created from the telephone survey data, there are a few key points to note: 1) 80% of San Diego County property owners rely heavily on the internet for public health information, 2) despite the fact that the majority of the population (90%) are aware of the presence of WNV in San Diego County, only 17% are making a concerted effort to change their behavior to protect themselves by staying indoors at dawn and dusk, and 3) only 14% of those interviewed believe that WNV is an extremely serious health problem. Information from this survey will be used to strategically formulate a WNV outreach campaign in 2010.

**FIGURE 10 – WHERE TO SEARCH FOR INFORMATION?**



**FIGURE 11 –2009 BEHAVIOR MODIFICATION RESULTS**



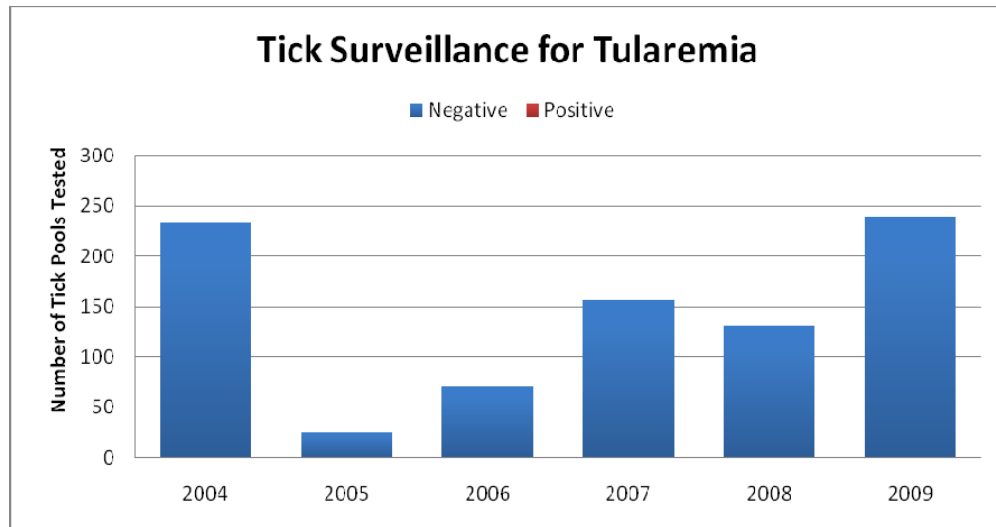
**TICK BORNE DISEASES**

**TULAREMIA**

Tularemia is a disease caused by the bacteria *Francisella tularensis*. It is typically found in smaller mammals, particularly rabbits. The primary vectors for this disease are the Pacific Coast Tick and the American Dog Tick. Both of these ticks are members of the *Dermacentor* genus. These ticks are commonly found in rural areas of the Assessment Area. They contract *F. tularensis* when they feed on infected animals and transmit the bacteria to the next animal on which they feed. This disease can also be transmitted by direct contact with an infected animal.

Tick surveillance conducted for tularemia over the past six years is shown in the figure below. In 2006, 71 tick pools (10 ticks per pool) of the *Dermacentor* genus were submitted for testing. Tick populations increased in 2009 allowing the SDCVCP to submit 240 pools for tularemia testing. While none of the submitted pools tested positive for tularemia, one rabbit submitted from North County early in the year tested positive.

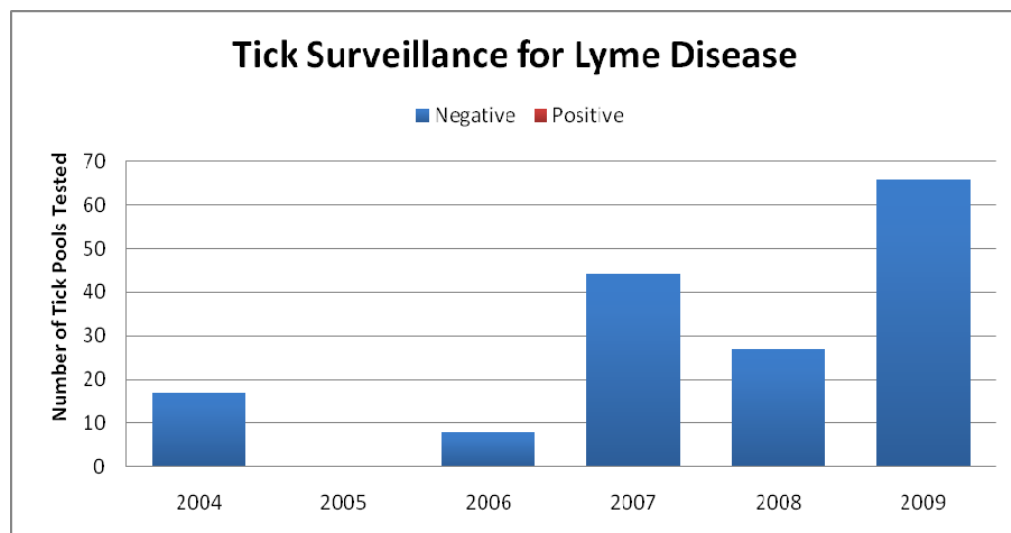
**FIGURE 12 – TULAREMIA SURVEILLANCE**



**LYME DISEASE**

Testing ticks in 1994 and 1995 demonstrated that Lyme disease, caused by the bacteria *Borrelia burgdorferi*, has occurred in San Diego County. However, there have been no positive ticks since 1995. The primary vector for this disease is the *Ixodes pacificus* or the Western Black-Legged Tick. It is commonly found in most rural areas of the Assessment Area. In 2005, possibly due to the heavy rains, the tick population was reduced and no Lyme disease testing was performed. The low populations continued through 2006 and only eight tick pools were submitted for testing. Populations have steadily increased since 2006 leading to the submission of 66 pools for testing in 2009. All of these pools tested negative.

**FIGURE 13 – LYME DISEASE SURVEILLANCE**



One human Lyme disease case was diagnosed in San Diego County in 2006. It is thought that the case may have been locally acquired. Warning signs were posted as a precaution in areas where the person had been. In 2009, one potential locally acquired human case was identified but the investigation on this case was inconclusive. Due to past Lyme disease prevalence in San Diego County, the SDCVCP continues to actively distribute information about tick identification, disease prevention and personal protection.

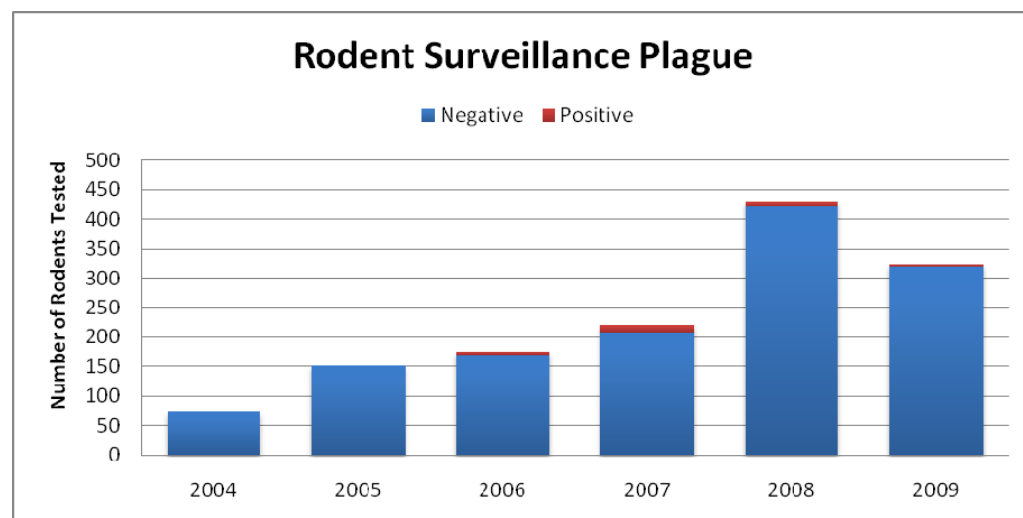
## RODENT BORNE DISEASE SURVEILLANCE

### PLAGUE

No human cases of plague, a disease caused by the bacteria *Yersinia pestis*, were reported within the Assessment Area in 2009. This disease is transmitted by the bite of infected fleas and direct contact with infected rodents, particularly ground squirrels. These rodents can act as reservoirs for the disease. Humans and their pets are vulnerable for infection when visiting areas abundant with rodents and fleas such as campgrounds or other rural areas. Ground squirrels are routinely tested at campgrounds by combing for fleas and collecting blood samples for plague testing.

Plague surveillance has been conducted mostly at higher elevations and has often yielded one or more plague-seropositive ground squirrels each year. In 2006, plague surveillance was expanded to lower elevations of the county and this continued in 2009. This testing has confirmed that plague currently occurs only at higher elevations (>3000 ft). In 2009, 323 rodents, primarily ground squirrels, were tested for plague. Three squirrels from the Palomar mountain area tested positive for plague. Due to the presence of plague in San Diego County, the SDCVCP continues to actively distribute information about disease prevention and personal protection.

**FIGURE 14 – PLAGUE SURVEILLANCE**



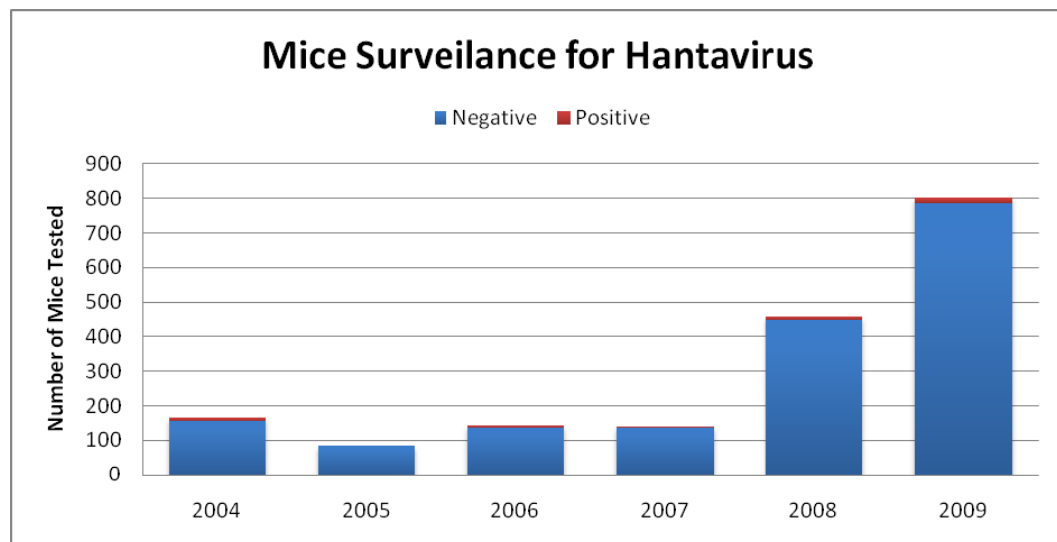
The SDCVCP has continued trapping rats in ports of entry to test for the presence of plague. This testing occurs where freight is received by boat, plane or truck from foreign points of origin. This surveillance is conducted twice a year. During the 2009 year, no rats tested positive for plague. The fleas collected off the rats were identified as competent vectors for plague, but none tested positive.

#### HANTAVIRUS

Both the hemorrhagic and respiratory strains of hantavirus occur in wild mice within the Assessment Area. Humans typically develop Hantavirus Pulmonary Syndrome (“HPS”) by breathing aerosolized particles of wild mouse droppings containing hantavirus. Most human cases occur when people open up and occupy mountain cabins or other small-enclosed structures infested with wild mice. The SDCVCP routinely conducts surveillance in numerous locations around the Assessment Area by trapping for wild mice. Blood samples are collected from these mice and submitted for hantavirus testing.

In 2004, the first locally acquired human case of HPS was reported from the east county community of Campo. During 2005, none of the mice tested positive for hantavirus. However, in 2006, six mice tested positive for hantavirus and in 2007, three mice tested positive. The SDCVCP staff made a strong effort to increase sampling in 2008 and 2009. In 2008, 11 mice tested positive while in 2009, 14 mice tested positive.

**FIGURE 15 – HANTAVIRUS SURVEILLANCE**



The SDCVCP has redesigned a page regarding hantavirus on its website (SDVector.com). A brochure was also updated to inform property owners how to properly clean up mouse

droppings in order to help prevent them from acquiring HPS. If a wild mouse tests positive for hantavirus, additional mice are trapped to determine the prevalence of the virus in the wild mouse population. In the case that prevalence is confirmed in that location, animal caution signs are posted. Public education is conducted through press releases, media interviews and outreach in the area where the disease is detected.

## **RODENT AND FLY VECTORS**

### **RODENTS**

Common rodents found in the County of San Diego include the Norway rat (*Rattus norvegicus*), and the Roof Rat or Black Rat (*Rattus rattus*). These rats are specifically included in the rodent prevention and control program for the SDCVCP. Native rats and mice such as the Dusky-Footed Wood Rat (*Neotoma fuscipes*) and the Deer Mouse (*Peromyscus maniculatus*) generally do not coexist with humans and are not the focus of control efforts, but control advice is offered.

In addition to being unsanitary, rodents harbor and transmit a variety of organisms that are capable of infecting humans. Rodent urine may contain the bacteria that causes leptospirosis and their feces may contain Salmonella bacteria. Infected rat fleas may transmit plague and murine typhus.

Rats can also cause significant property damage. Rats can cause damage to woodwork and electrical wiring, potentially resulting in shorted circuits and fires. Rats are also commonly known for chewing hoses and belts in automobiles. An abundance of rats in public areas such as community parks can cause loss of interest and use by the public.

The SDCVCP assists property owners with their rat control efforts by providing inspections and consultations. The Program performs exterior site inspections to educate property owners about structural weaknesses that may allow rats to enter the home. During these consultations, a rat control starter kit is provided to the property owner. These kits include a bait station, trap, a DVD and helpful information for control measures focusing on exclusion and elimination. The SDCVCP homepage ([SDVector.com](http://SDVector.com)) provides the public with information about domestic rat control. This site also enables the public to request service through email.

The SDCVCP has delivered several presentations to homeowner and community groups on rat control and has distributed educational materials at community events. The SDCVCP collaborates with other regional agencies to prevent and eliminate rat infestations and harborages. In 2009, the SDCVCP responded to 1541 complaints from

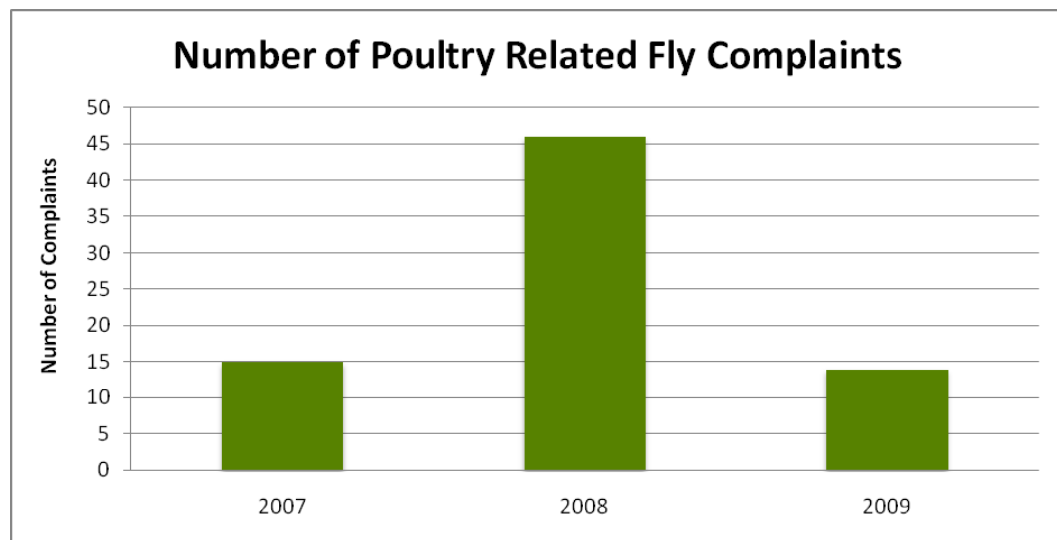
residents pertaining to domestic rats. The Program primarily relies on public education and public cooperation for domestic rat control and employs no regulatory authority.

## FLIES

The SDCVCP's Fly Abatement Program operates under the authority vested by San Diego County Ordinance No. 7025, Regulatory Ordinances Relating to the Prevention and Control of Fly Breeding on Commercial Poultry Ranches and Other Sources. Annual Manure Management Proposals are prepared by each rancher for approval by the SDCVCP. The poultry ranch operator is expected to follow this plan in the management of manure. This can help reduce fly abundance generated by the ranch. Routine, complaint-based inspections and enforcement are used in order to assure the prevention and abatement of flies which may constitute a threat to public health and welfare.

The SDCVCP responds to general back yard sources of fly complaints with on-site visits. The Program also provides public education about sanitation, fly exclusion and control. Flies can be a threat to public health and a nuisance in the unincorporated areas of the County of San Diego. In 2009, San Diego County property owners lodged 99 complaints concerning nuisance flies, 14 of which involved commercial poultry ranches. This is a decrease from 2008 but similar with levels seen in 2007.

**FIGURE 16 – FLY COMPLAINTS RELATED TO POULTRY**

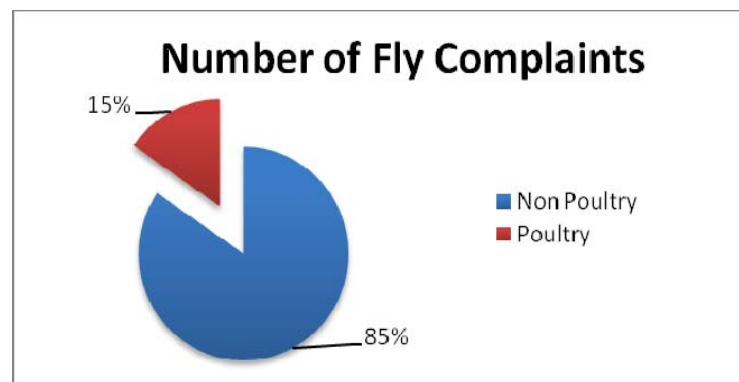


Common backyard fly sources include poultry, horse and livestock manure. Flies can also be found within the city limits breeding in garbage cans, dumpsters, compost piles and organic matter. The most common fly is the House fly (*Musca domestica*) and is most

abundant in the summer months. In warmer months they can fully develop in less than one week. House fly populations can grow to large numbers depending on the availability of food sources. This can be particularly troublesome around poorly managed poultry ranches or other livestock operations where manure accumulates and is not able to dry. House flies are strong fliers and are known to fly as far as 20 miles.

The Little house fly (*Fannia canicularis*) is known as the spring fly or cooler season fly. The little house fly is the second most common pest species, particularly in poultry ranches. In some areas, the little house fly may rival the house fly as the predominant pest species.

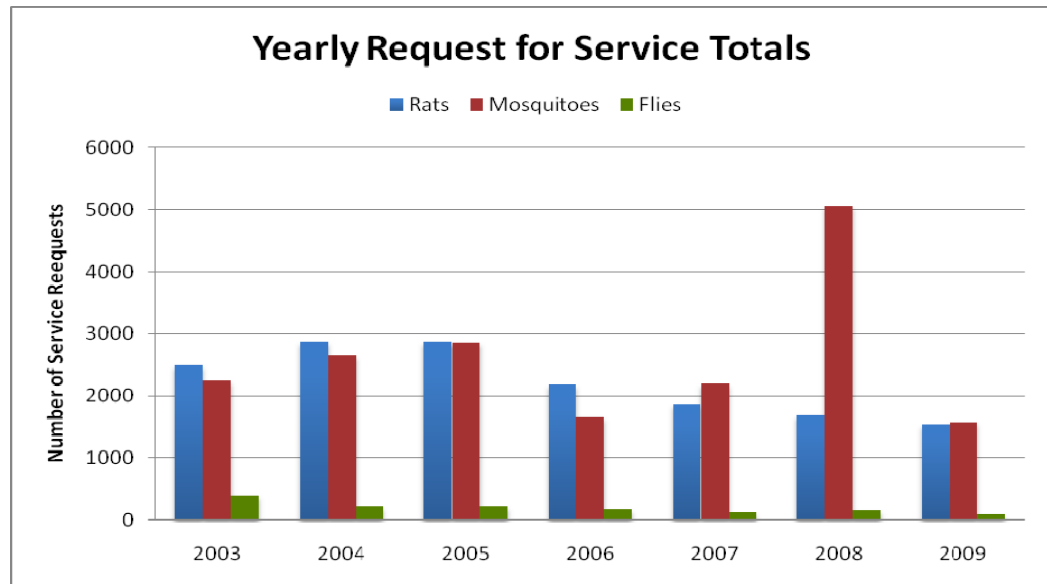
**FIGURE 17 – 2009 FLY COMPLAINTS**



#### **RESPONSE/CUSTOMER SERVICE**

In 2009, the SDCVCP responded to 1,581 property owner complaints or service requests regarding mosquito nuisance and breeding. The level of complaints regarding mosquitoes was dramatically reduced from the record high levels of 2008. While many complaints involved major mosquito breeding sources, most involved smaller or intermittent backyard sources. In addition the SDCVCP responded to 1,541 property owners' complaints or service requests relating to domestic rats and 99 property owner complaints regarding flies.

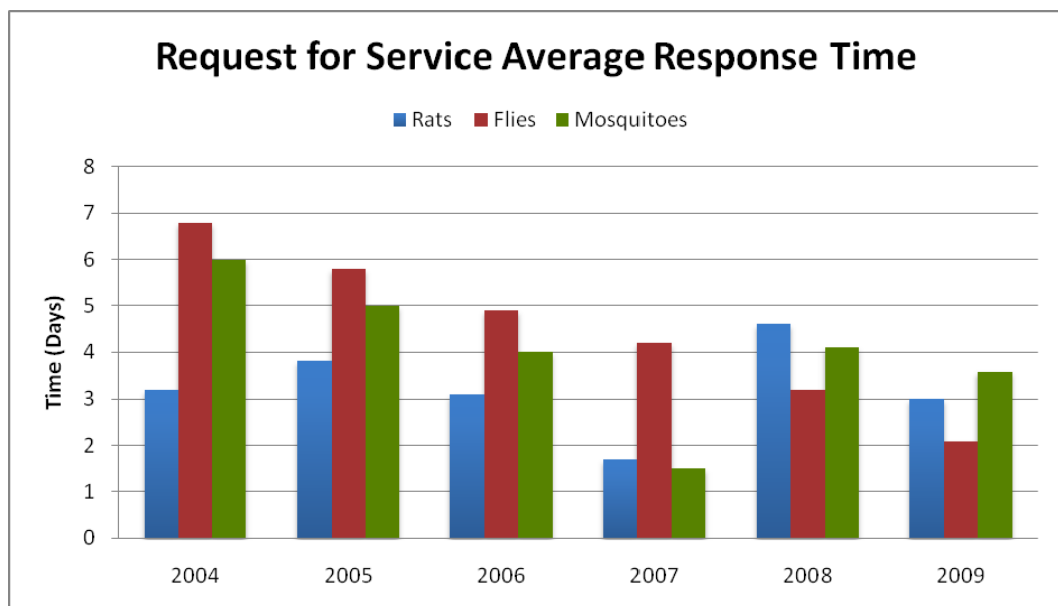
**FIGURE 18 – VECTOR CONTROL SERVICE REQUEST COMPARISON**



During 2009, the average response time (excluding weekends and holidays) for complaints is shown in the table below:

- 3.6 days for mosquito complaint investigation
- 3.0 days for rat complaint investigation
- 2.1 days for fly complaint investigation

**FIGURE 19 – OVERALL AVERAGES COMPLAINT RESPONSE TIMES**



## SERVICE REQUESTS

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

## NEW PLANNED EFFORTS

### VECTOR CONTROL HABITAT REMEDIATION PROGRAM

The Vector Habitat Remediation Program Plan (VHRP or Plan) intends to develop long-term solutions to historically chronic mosquito breeding sites. In order to reduce disease transmission the VHRP proposes to control mosquito populations by implementing measures that will reduce mosquito breeding habitat throughout the Assessment Area. The proposed Plan is intended to fund projects that will reduce and/or eliminate mosquito breeding grounds in established wetlands, flood control facilities and stormwater treatment facilities. The Plan will review and potentially provide funding to projects that reduce and/or eliminate mosquito breeding habitat. The VHRP will take into consideration the biological and hydrological values of wetlands and the need to protect human populations and animals from mosquito-borne diseases.

The goal of the VHRP is to implement measures that promote the proper management of water bodies and wetlands with mosquito control in mind. The remediation of water bodies by reduction of overgrown vegetation and accumulated sediment will enhance and restore water flow thus reducing mosquito breeding potential. This Plan will take into account the protection of wildlife, water quality and those agencies concerned, with the intent of restoring the ecology to a healthy balance.

In compliance with the California Environmental Quality Act (CEQA), a Program Environmental Impact Report (PEIR) was developed for the proposed VHRP in 2009. The PEIR was completed and certified by the Board of Supervisors in March 2010.

### THE OFFICE OF THE COUNTY VETERINARIAN JOINS SDCVCP

In a collaborative effort, the SDCVCP has funded the Office of the County Veterinarian – ADDL to perform vector-borne disease testing since 1990. Originally focused on Lyme disease and tularemia, the program expanded in 2006 to a comprehensive dead bird WNV surveillance program. In this program dead corvids, raptors and other selected bird

species are retrieved by the SDCVCP for testing at the ADDL. The collaboration between the SDCVCP and the ADDL resulted in more accurate test results and faster turn around time. Whereas it would take 2-4 weeks when outsourced, it now takes as little as four hours to receive results. The ADDL published an article in the July 2009 edition of the Journal of Veterinary Diagnostic Investigation based on its development of an improved, cost-efficient technique for detecting WNV in birds. The ADDL also currently tests for plague, tularemia, Lyme and hantaviruses.

Future plans of the ADDL include providing additional testing for emerging and re-emerging vector-borne diseases such as SLE, WEE and spotted fever group Rickettsia (such as Rocky Mountain Spotted Fever). The ADDL will continually monitor and evaluate the global and local status of vector-borne diseases and disperse public health information to communities through publications, presentations, public health service meetings and continuing education seminars.

#### EYE GNAT CONTROL

Property owners in Jacumba have submitted complaints about eye gnats impacting their quality of life. The County of San Diego recognizes the impacts of the large eye gnat populations, generated from a nearby organic farm, on the property owners of this community.

Because the farm is organic, traditional pesticides cannot be used to control the eye gnats. In response to community needs the University of California Cooperative Extension, San Diego County, was tasked with understanding the dynamics of the eye gnat in Jacumba. Several emergence trials were conducted which resulted in the development of eye gnat population reduction recommendations for the farm.

These recommendations are now recognized as the "Eye Gnat Nuisance Prevention Plan (2010)." The University of California will continue to work to evaluate the effectiveness of the plan. The SDCVCP will monitor compliance of the farm with the plan. If successful these principals may be applied to other organic farms in the region.

## ESTIMATE OF COST

**FIGURE 20 – COST ESTIMATE FOR FISCAL YEAR 2010-11**

<b>Capital Improvement Plan</b>			<i><b>Total Budget</b></i>
<b>Mosquito, Vector and Disease Control Assessment</b>			
Estimate of Cost Fiscal Year 2010-11			
Vector Control Services and Related Expenditures			
Vector Control and Disease Prevention Operations		\$4,675,722	
Materials, Utilities and Supplies		\$2,631,206	
Capital Equipment and Fixed Assets		\$351,277	
<b>Total Vector Control Services and Related Expenditures</b>		<b>\$7,658,205</b>	
Less:			
Contributions from other Sources <sup>1</sup>		(\$2,601,322)	
<b>Net Cost of Vector Control, Fixed Asset Equipment, Operation</b>		<b>\$5,056,883</b>	
Reserve/Contingency Funds		(\$1,606)	
Incidental Costs <sup>2</sup>			
County Collection, Levy Administration, and Other Incidentals		\$556,536	
<b>Total Mosquito, Vector &amp; Disease Control Services and Incidentals</b>		<b>\$5,611,812</b>	
(Net Amount to be Assessed)			
<b>Budget Allocation to Property</b>			
	Total SFE Units <sup>3</sup>	Assessment per SFE <sup>4</sup>	Total Assessment <sup>5</sup>
	905,131	\$6.20	\$5,611,812

Notes:

- As determined in the following section, at least 7% 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 \$7,658,205 the SDCVCP must contribute at least \$536,074 from sources other than the assessments. The SDCVCP will contribute over \$2,601,322, which is well over the estimated general benefits.
- Incidental Costs includes allowance for uncollectible assessments from assessments on public agency parcels, County collection charges, and assessment administration costs. For fiscal year 2010-11, the first fiscal year the assessments are levied, this amount also includes the benefit assessment initial costs, such as initial assessment engineering services.
- SFE Units means Single Family Equivalent benefit units. See method of assessment in the following Section for further definition.

4. The assessment rate per SFE is the total amount of assessment per Single Family Equivalent benefit unit.
5. 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. The assessment amounts are rounded down to the even penny for purposes of complying with the collection requirements from the County Auditor. Therefore, the total assessment amount for all parcels subject to the assessments may vary slightly from the net amount to be assessed.

## **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 SDCVCP, 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 within the County, as defined by the approved boundary description (boundary will be coterminous with the county of San Diego).

The method used for apportioning the assessment is based upon the proportional special benefits to be derived by the properties in the Assessment Area over and above general benefits conferred to the public at large or 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 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>2</sup>*

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

The Legislature also 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, which was signed into law in 2002, 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

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<sup>2</sup> Howard Jarvis Taxpayers Association, "Statement of Drafter's Intent", January 1997.

218 is shown in the Assembly and Senate analysis the Mosquito Abatement and Vector Control District Law where it states that the law:

*Allows special benefit assessments to finance vector control projects and programs, consistent with Proposition 218.<sup>3</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 assessment engineer identified the types of special benefit arising from the aforementioned Services and that would be provided to property in the Assessment Area. 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.**

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<sup>3</sup> Senate Bill 1588, Mosquito Abatement and Vector Control District Law, Legislative bill analysis

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 are 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 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>4</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>5</sup>*

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<sup>4</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, areas in Marin and Sonoma Counties and many other areas in the State 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>5</sup> Assembly Concurrent Resolution 52, chaptered April 1, 2003

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:

*"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>6</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>7</sup> This is not a general benefit to property in the Assessment Area or the public at large because the Services are

<sup>6</sup> Riesen William K. (2008). Delinquent Mortgages, Neglected Swimming Pools, and West Nile Virus, California. Emerging Infectious Diseases. Vol. 14(11).

<sup>7</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.

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 SDCVCP 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>8</sup>*

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

*“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>9</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*

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<sup>8</sup> Assembly Concurrent Resolution 52, chaptered April 1, 2003

<sup>9</sup> Rose, Robert. (2001). Pesticides and Public Health: Integrated Methods of Mosquito Management. Emerging Infectious Diseases. Vol. 7(1); 17-23.

*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>10</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:

*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>11</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 Assessment Area.

Mosquitoes hinder, annoy and harm residents, guests, visitors, farm workers, and employees. A vector-borne disease outbreak and other related public health threats would

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<sup>10</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.

<sup>11</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)

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:

*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>12</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>13</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.

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<sup>12</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>13</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

- **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.

*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>14</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>15</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.

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<sup>14</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/cnahs/nahms/equine/wnv2002\\_CO\\_NB.pdf](http://www.aphis.usda.gov/vs/ceah/cnahs/nahms/equine/wnv2002_CO_NB.pdf)

<sup>15</sup> Jennings, Allen. (2001). USDA Letter to EPA on Fenthion IRED. United States Department of Agriculture, Office of Pest Management Policy. March 8, 2001.

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>16</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.

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>17</sup>

## **BENEFIT FINDING**

In summary, the special benefits described in this Report and the improved 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 proposed annual assessment amount per benefit unit.

## **GENERAL VS. SPECIAL BENEFIT**

Article XIIC 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

<sup>16</sup> Sources of mosquitoes on residential, business, agricultural, range and other types of properties include removable sources such as containers that hold standing water.

<sup>17</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.

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:

$$\text{Total Benefit} = \text{Total General Benefit} + \text{Total Special Benefit}$$

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>18</sup>” but 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:

GENERAL BENEFIT =

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<sup>18</sup> SVTA vs. SCCOSA explains as follows:

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.

BENEFIT TO REAL PROPERTY OUTSIDE THE ASSESSMENT AREA +  
 BENEFIT TO REAL PROPERTY INSIDE THE ASSESSMENT AREA THAT IS INDIRECT AND  
 DERIVATIVE +  
 BENEFIT TO THE PUBLIC AT LARGE

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. XIII D, 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 Assessment Area would be over and above this baseline. Arguably, all of the Services to be funded by the assessment therefore would be 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.

Nevertheless, arguably some of the Services would 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 Assessment Area 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 Assessment Area 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 ASSESSMENT AREA**

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 Assessment Area 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 Assessment Area 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>19</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.

233,032 PARCELS WITHIN 2 MILES OF, BUT OUTSIDE OF THE ASSESSMENT AREA, MAY RECEIVE SOME MOSQUITO AND DISEASE PROTECTION BENEFIT

6% PORTION OF RELATIVE BENEFIT THAT IS RECEIVED

1,034,810 PARCELS IN THE ASSESSMENT AREA

CALCULATIONS

TOTAL BENEFIT = 233,032 PARCELS \* 6% = 13,982 PARCELS EQUIVALENTS

PERCENTAGE OF OVERALL PARCEL EQUIVALENTS = 13,982 / 1,034,810 = **1.35 %**

Therefore, for the overall benefits provided by the Services to the Assessment Area, it is determined that 1.35% 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 2.0%.

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<sup>19</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 ASSESSMENT AREA 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 SDCVCP was 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 SDCVCP and to have a SDCVCP 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. This concept is particularly applicable in situations involving a landowner-approved assessment-funded extension of a local government service to benefit lands previously not receiving that particular service. We therefore conclude 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 1.5% of the land area in the Assessment Area is covered by highways, streets and sidewalks. This 1.5% 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 3.5% 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 =

1.5 % (OUTSIDE THE ASSESSMENT AREA)  
 + 0.0 % (INSIDE THE ASSESSMENT AREA - INDIRECT AND DERIVATIVE)  
 + 2.0 % (PUBLIC AT LARGE)

**=3.5 % (TOTAL GENERAL BENEFIT)**

Although this analysis supports the findings that 3.5% of the assessment may provide general benefit only, this number is doubled by the Assessment Engineer to 7% 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 proposed Mosquito, Vector and Disease Control assessment total budget for mosquito and vector abatement, disease control, and capital improvement is \$5,289,394. Of this total budget amount, the SDCVCP will contribute approximately \$2,750,000, or 34% 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**

In *SVTA v. SCCOSA*, the court noted that a local agency-wide assessment district is appropriate under the right conditions: "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 a 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)." The court therefore acknowledged the appropriateness of a District-wide assessment so long as each parcel receives a direct advantage from the assessment-funded improvement or service. As demonstrated in this Report, each parcel in the Assessment Area receives a direct advantage and special benefit from the Services.

The SDCVCP's mosquito, vector, and disease control programs, projects and services that will be funded by the Assessments will be provided in all areas within the County. Since the Services will be provided throughout the County and will result in reduced vector populations and the other special benefits for property throughout the County, the boundaries of the Assessment Area have been drawn to match the boundaries of the County. Parcels of similar type in the Assessment Area would receive similar mosquito and vector abatement services and benefits on a per parcel and land area basis. The SDCVCP is currently developing tools to evaluate and confirm that special benefit is consistent throughout the Assessment District. The results will be incorporated into the Engineer's Reports in subsequent years.

### **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 partially be measured by the property owners, guests, employees, tenants, pets and animals on property in the Assessment Area who will enjoy a more habitable, safer and more desirable place to live, work or visit. 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>20</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 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, mosquitoes can rapidly and readily fly from their breeding locations to other properties over a large area, and because there are current or potential

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<sup>20</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.”

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 throughout the Assessment Area.

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 county. This benefit can be in part measured 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>21</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:

$$\text{Special Benefit (per property)} = \frac{\sum (\text{Special Benefits}) *}{\sum (\text{Property Specific attributes such as use, property type, size, as well as vector-specific attributes such as destination potential and population potential})}$$

#### RESIDENTIAL PROPERTIES

Certain residential properties in the Assessment Area that represent a single residential dwelling unit are assigned one Single Family Equivalent or 1.0 SFE. Traditional houses, zero-lot line houses, and townhomes are included in this category.

Single family residential properties in excess of one acre receive additional benefit relative to a single family home on up to one acre, because the larger parcels provide more area for mosquito sources and Assessment Area 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 equal to the agricultural rate described below 0.002 SFE per one-fifth acre of land area in excess of

<sup>21</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.

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 on the property.

Properties with more than one residential unit are designated as multi-family residential properties. These properties, along with condominiums, benefit from the services and improvements 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 San Diego County. This Report analyzed San Diego 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 20 below.

The SFE factor of 0.40 per dwelling unit for multifamily residential properties applies to such properties with 20 or fewer units. Properties in excess of 20 units typically offer on-site management, monitoring and other control services that tend to offset some of the benefits provided by the Services. Therefore, the benefit for properties in excess of 20 units is determined to be 0.40 SFE per unit for the first 20 units and 0.10 SFE per each additional unit in excess of 20 dwelling units.

**FIGURE 21 – SAN DIEGO COUNTY 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	1,562,129	513,948	3.04	1.00	1.00	<b>1.00</b>
Condominium	250,673	93,642	2.68	0.88	0.79	<b>0.70</b>
Duplex, Triplex, Fourplex	189,407	73,620	2.57	0.85	0.62	<b>0.53</b>
Multi-Family Residential, 5+ Units	622,092	270,015	2.30	0.76	0.52	<b>0.40</b>
Mobile Home on Separate Lot	88,674	41,225	2.15	0.71	0.47	<b>0.33</b>

Source: 2000 Census, San Diego County and property dwelling size information from the San Diego 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 residents and employees also provide 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 San Diego County is 0.20 acres. Therefore, a commercial property with 0.20 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 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 Figure 21, 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 fifth 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.

Figure 21 below, lists the benefit assessment factors for business properties.

#### AGRICULTURAL/OTHER PROPERTIES

Utilizing research and agricultural employment reports from UC Davis and the California Employment Development Department and other sources, this Report calculated an average employee density of 0.05 employees per acre for agriculture property, 3.0 for golf courses, 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 employee density ratio of commercial properties. The SFE factors per 0.20 acres of land area for these types of property are also shown in Figure 21.

**FIGURE 22 – COMMERCIAL/INDUSTRIAL BENEFIT ASSESSMENT FACTORS**

<i>Type of Commercial/Industrial Land Use</i>	<i>Average Employees Per Acre <sup>1</sup></i>	<i>SFE Units per 1/5th 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	0.050	
Golf Course	3.00	0.125	
Cemetery	1.20	0.050	
Agriculture	0.05	0.002	
Rangeland, Dry Farming and Timber	0.01	0.0004	

1. Source: San Diego Association of Governments Traffic Generators Study, University of California, Davis and other sources.
2. The SFE factors for commercial and industrial parcels indicated above are applied to each fifth 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 (undeveloped) 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 Diego found that 50% 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 0.50 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 0.25 factor. It is reasonable to assume, therefore, that approximately 25% of the benefits are related to the underlying land and 75% are related to the day-to-day use of the property. Using this ratio, the SFE factor for vacant parcels is 0.25 per parcel.

## OTHER PROPERTIES

Article XIID stipulates that publicly owned properties must be assessed unless there is clear and convincing evidence that those properties 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. Therefore, these parcels receive minimal benefit and are assessed an SFE factor of 1.

## DURATION OF ASSESSMENT

The Assessment was levied for fiscal year 2005-06 and every year thereafter, so long as mosquitoes and vectors remain in existence and the San Diego County Vector Control Program requires funding from the Assessment for its Services. As noted previously, the Assessment and the duration of the Assessment were approved by property owners in an assessment ballot proceeding, the Assessment has been levied annually after the San Diego County Board of Supervisors approved an annually updated Engineer's Report, budget for the Assessment, Services to be provided, and other specifics of the Assessment. In addition, the Board of Supervisors 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 Program Manager of the San Diego Mosquito and Vector Control Program 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 Program Manager or his or her designee will promptly review the appeal and any information provided by the property owner. If the Program 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 Diego County for collection, the Program 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 Program Manager, or his or her designee, shall be referred to the Board. The decision of the Board shall be final.

## ASSESSMENT

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**WHEREAS**, the Board of Supervisors contracted with the undersigned Engineer of Work to prepare and file a report presenting an estimate of costs of Services, a diagram for a benefit assessment district, an assessment of the estimated costs of Services, and the special and general benefits conferred thereby upon all assessable parcels within San Diego County - 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 Board of Supervisors of San Diego County, 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 amount to be paid for the services and improvements and the expenses incidental thereto, to be paid by the San Diego County Vector Control Program for the fiscal year 2010-11 is generally as follows:

**FIGURE 23 – SUMMARY COST ESTIMATE FISCAL YEAR 2010-11**

Vector & Disease Control Services	\$7,306,928
Fixed Asset & Capital Equipment	\$351,277
Reserve/Contingencies	-\$1,606
Incidentals	\$556,536
<b>TOTAL BUDGET</b>	<b>\$8,213,134</b>
Less:	
District Contribution & Current Rev.	(\$2,601,322)
<b>Net Amount To Assessments</b>	<b>\$5,611,812</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 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 the 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 the 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 will be annually adjusted. The amount of the adjustment will be tied to the Consumer Price Index for the San Diego Area as of December of each succeeding year (the "CPI"), with a maximum annual adjustment not to exceed 5%. Any change in the CPI in exceeds 5%, shall be cumulatively reserved as the "Unused CPI" and can be added to the annual change in the CPI for years in which the CPI change is less than 5%. 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) 5% or 2) the change in the CPI plus any Unused CPI as described above.

The change in the CPI from December to December was 0.0% and the Unused CPI carried forward from the previous fiscal year is 0%. Therefore, the maximum authorized assessment rate for fiscal year 10-11 will remain at \$9.74 per single family equivalent benefit unit. The estimate of cost and budget in this Engineer's Report proposes assessments for fiscal year 10-11 at the rate of \$6.20, which is less than the maximum authorized assessment rate.

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 Diego for the fiscal year 2010-11. 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 Diego.

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 2010-11 for each parcel or lot of land within the Mosquito, Vector and Disease Control Assessment Area.<sup>22</sup>

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<sup>22</sup> Each parcel has a uniquely calculated assessment based on the estimated level of special benefit to the property as determined in accordance with this Engineer's Report.

Dated: \_\_\_\_\_

Engineer of Work

By John W. Bliss  
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 San Diego County.

The boundaries of the Mosquito, Vector and Disease Control Assessment Area are displayed on the following Assessment Diagram. Indian reservation land, as a Sovereign Nation, is excluded from the Assessment Area. Also, federally owned lands, and receive minimal to no services, are depicted with a two-tone diagonal line shade.

Insert diagram here!



## **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 Program Manager of the of the San Diego Mosquito and Vector Control Program, as the Assessment Roll is too voluminous to be bound with this Engineer's Report.