

**KERN COUNTY**

**WEST NILE VIRUS**  
**STRATEGIC RESPONSE PLAN**

**Adopted**  
**May, 2008**

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## EXECUTIVE SUMMARY

The Kern County West Nile Virus Strategic Response Plan is intended to provide guidance in protecting the county residents from infection with West Nile Virus (WNV) and reducing/eliminating the presence of WNV infection in the environment by: 1) Enhancing existing vector surveillance and control programs 2) Enhancing interagency communication 3) Educating the public on preventing their exposure to mosquitoes and the importance of eliminating mosquito breeding habitats.

West Nile Virus was first detected in the United States in the State of New York in 1999. The illness has spread from east to west across the United States by birds and mosquitoes. At this time, vaccines are not available for use in humans. The initial Strategic Response Plan was completed in February 2004 prior to the first detection of WNV activity in Kern County. At the time of this revision, Kern County has experienced WNV activity for five seasons (2004-2008). During the 5 years that human WNV infections have occurred in California, jurisdictions with the highest numbers of cases between 2003 and 2007 have ranged from 1 case (one each in Imperial, Orange and Los Angeles Counties during 2003) to 323 cases in Los Angeles County during 2004. During 2007, Kern County had 140 cases of WNV in humans.

The Kern County West Nile Virus Taskforce was formed in response to this threat. Taskforce membership includes Mosquito Abatement Districts (MADS), Kern County Department of Public Health (KCDPH), Environmental Health Department, Agricultural Commissioner, Engineering and Survey Services and City Code Enforcement Departments. In addition to ongoing meetings, the Task Force membership is often in contact.

As mentioned above, in 2007, Kern County experienced a substantial increase in the incidence of West Nile Virus. On August 2, 2007 in Bakersfield, Governor Schwarzenegger declared a State of Emergency in the counties of Kern, Colusa and San Joaquin. The Governor subsequently ordered the state to allocate up to \$10 million in funding to fight the virus. The funding was intended to pay for local vector control agencies to identify mosquito habitats, treat areas to prevent the spread of West Nile Virus and conduct surveillance and warning operations so that counties can effectively fight the health threat. Kern Mosquito and Vector Control District received \$288,000 for aerial photo survey of green pools, aerial spraying, and supplies and equipment. The aerial photo survey of green pools played a tremendous role in targeted outreach in the community during the community outreach campaign. On September 10, 2007, the Governor issued executive order S-12-07 to extend funding activities beyond emergency mosquito control and WNV surveillance. These funds were marked to enhance education of the public and intensify human case surveillance. Kern County Department of Public Health was awarded \$364,834, which was used for case follow-up, community education campaign, and additional drainage sump cleanup.

Predicting the future incidence of West Nile Virus has been problematic. Even in retrospect, explaining the unexpected spike in West Nile Virus for Kern County in 2007 is still guesswork. State and local entomologists agree that the following factors contributed to this outbreak: drought conditions, higher than normal WNV infected mosquito survival over the winter, early temperature spike, and an increase in the number of water impoundments (i.e. green pools).

Despite the abundance of mosquitoes being substantially lower in 2007, the number of WNV infected mosquitoes lead to a significant increase in the incidence of human WNV.

The “lessons learned” from responding to challenges of the increased incidence of WNV are being used to guide future response decisions in WNV management in Kern County.

#### Lessons Learned

- A. The Board of Supervisors (BOS) leadership was instrumental in obtaining the Governor’s Emergency Declaration. This measure brought needed resources to the valley.
  - 1. Kern Mosquito and Vector Control District received \$288,000.
  - 2. Kern County Department of Public Health was awarded \$364,834.
- B. Home interviews on all human WNV cases created an opportunity to provide resource information useful to the affected families in addition to gathering data about the nature of their individual infection.
- C. Local realtors were responsive in assisting in the identification of abandoned properties with pools, fountains and spas.
- D. Aerial photographic surveys facilitated identification of “green pool” locations.
- E. The “layered” WNV prevention messages utilizing billboards, radio, television, group presentations and printed literature achieved an increased awareness and sustained knowledge base among multiple age groups in the community.
- F. The community was receptive to WNV prevention messages and mosquito repellent wipes at high-risk outdoor events such as evening sport gatherings.

#### Work In Progress

- A. Monthly meeting of WNV Task Force and Stakeholders beginning March of each vector season. WNV Task Force consists of Mosquito Abatement Districts (MADS), KCDPH, Kern County Engineering & Survey Services Department (KCEHSD) and Kern County Environmental Health Services (KCESS). WNV Stakeholders include but are not limited to, Kern High School District, Kern County Superintendent of Schools, Bakersfield Association of Realtors, Edwards Air Force Base, Kern County Water Agency and Kern County Farm Bureau.
- B. Monthly reporting of remediation efforts to the Board of Supervisors. A “Normal Season/ Emergency Planning/Epidemic Conditions” risk opinion will be provided for consolidated efforts, resource identification, and prioritizing unmet needs. If Emergency Planning/Epidemic Conditions occur, immediate presentation to the Board of Supervisors will be made at the next available Board of Supervisors meeting. See Appendix ‘A’ Characterization of Conditions and Responses.
- C. Creation of a system for early identification of abandoned properties posing a WNV risk.
- D. Soliciting retailer participation in making WNV information available and positioning mosquito repellent in “high profile” locations in the store.
- E. Exploring the option for getting volunteers lined up in order to distribute informational brochures and door hangers to communities where there is evidence of heightened WNV activity during the 2008 vector season if needed.
- F. WNV information to be posted on KCDPH County website.
- G. Request water companies to include caution to customers to avoid “overwatering”.

#### Unmet Needs

- A. Funding for services to areas of the county without mosquito abatement districts.
- B. MADS and code enforcement need current and updated lists of abandoned properties to remediate WNV hazards in a timely manner.
- C. A listing of the location and responsible party for all the public and private sumps in the county.
- D. Estimated funding for Kern County Engineering and Survey Services (KCESS) to do routine county sump maintenance and major cleanup (requiring use of heavy equipment) on a “once in four year” per sump cycle would be \$600,000 per year based on number of current sumps and current equipment and supply costs.

## **PURPOSE STATEMENT**

The purpose of the revision of the Kern County West Nile Virus Strategic Response Plan is to incorporate lessons learned since the occurrence of WNV in Kern County. This plan provides direction and guidance to County of Kern agencies, city governments, other community organizations, residents and visitors in providing protection and responding to the impact of WNV.

## **STRATEGY**

While mosquito populations can be controlled and reduced, it is not possible with current technology to completely eradicate mosquitoes. This plan outlines some of the most effective use of existing resources to aid in managing the effects of WNV in the county and how the Kern County West Nile Virus Taskforce may respond to current and future WNV activity. The plan will also provide the mechanism for assessing needs and addressing circumstances specific to the current WNV season so that decision makers can determine in what ways needs may be met and whether additional resources are needed in order to address unmet needs. The strategies in this plan will be implemented as appropriate and to the extent of available resources.

## **BACKGROUND**

Since the 1930s, human cases of WNV have been commonly reported in North Africa, West Asia, and the Middle East. In 1999 and 2000, outbreaks of WNV in the U.S. were first reported in persons living in the New York City metropolitan area. During these two years, 83 cases were reported with nine deaths. From New York, WNV spread rapidly westward and by 2004 had been detected in 48 of the United States, including California. WNV is having a serious impact upon the health of humans, horses, and wild birds throughout California. In 2006, there were 292 WNV human infections with 7 deaths and 58 horse cases (24 died or were euthanized). Kern County was hit particularly hard in 2007 with 141 Kern County residents diagnosed with WNV and four deaths. According to the Centers for Disease Control, Kern was the No. 1 County nationwide for the number of cases in 2007. The Governor declared a State of Emergency in July 2007, which released additional funds to the County for a short-term expansion of surveillance and prevention programs.

Infection with WNV has been found in more than 110 bird species. The majority of the time WNV cycles between mosquitoes and birds. In addition to mosquitoes and birds, humans and

other mammals can be infected with WNV. During 2007, Kern County was subject to several factors which contributed to the high number of human WNV cases. 1) WNV infected female mosquitoes survived the winter (overwintering) after 2006. This created generations of WNV infected mosquitoes at the time of maturity that did not have to enter the cycle of contact with an infected bird to become WNV infected. 2) Drought conditions meant there was little water in outlying areas for birds and they sought sources in densely populated areas with water such as pools. 3) An abundance of improperly maintained water impoundments afforded breeding locations for mosquitoes (foreclosures etc.). 4) High temperatures beginning in June of 2007 favored mosquito maturation to the adult stage in a much shorter time than would have been usual with temperatures than had been experienced during earlier years. Mosquitoes require standing water at the beginning of their life cycle and can reproduce in the smallest amounts of water they can find. Small amounts of standing water as can be found in a flowerpot can produce hundreds of mosquitoes.

WNV has been found in a number of other animal species, particularly horses. Most humans infected with WNV have no severe symptoms. A small number of people develop mild symptoms that include fever, headache, body aches, skin rash and swollen lymph glands. Less than 1 percent of infected people develop a more severe illness, including meningitis or encephalitis. A small portion of those with severe symptoms, mostly people over the age of 50, may suffer fatal consequences. There is no known cure or vaccine for humans infected with WNV making prevention the best defense in responding to WNV and other mosquito borne illnesses in the environment.

The public health threat of WNV can be addressed through:

- Mosquito Control
- Surveillance and Response
- Remediation
- Public Education

## **MOSQUITO CONTROL**

**Goal:** To reduce the number of mosquito breeding sites in Kern County.

Mosquito breeding is a naturally occurring event throughout the County. It is not possible or warranted to attempt to completely eradicate the mosquito population. Resources must be carefully allocated to control mosquito populations in areas that pose the greatest risk to public health while preserving the environment, as well as sensitive habitats. Although the focus will be on the human population, many animals, such as horses and pigs, are often in close proximity to areas of human habitation and will benefit from mosquito control efforts.

To effectively break the chain of events that lead to the spread of WNV, the most effective measures have been directed at the reduction of mosquito populations. The lifecycle of the mosquito is inherently associated with standing water. Elimination of mosquito breeding locations will reduce the mosquito population and the spread and impact of WNV. Common permanent and semi-permanent water impoundments include backyard ponds, fountains, sumps, livestock watering troughs, abandoned swimming pools and spas. Within their respective

boundaries, the Mosquito Abatement Districts employ Integrated Pest Management (IPM). IPM uses physical, biological and chemical control measures. Such activities will range from:

- Physical control measures:
  - Elimination of standing water on agricultural and residential properties by discarding water impoundments
    - Old tires
    - Buckets
    - Any container that can hold water.
  - Elimination of water leaks through maintenance of irrigation systems and plumbing.
  - Elimination of mosquito-breeding sites by removal of vegetation along drainage channels, sumps, and other water impoundments.
- Biological control measures:
  - Mosquito fish prefer to feed on mosquito larvae.
  - *Bacillus thuringiensis* (a naturally occurring bacteria) are target specific for mosquito larvae.
- Chemical control measures:
  - Eliminates mosquitoes in the larval (aquatic) stage.
  - Kills adult mosquitoes
  - Common target specific larvicides:
    - Methoprene, a synthetic juvenile growth hormone.
    - Pyrethrins and synthetic pyrethroids

Mosquito control measures are further delineated in Appendix 'I'- "Kern County Mosquito Control & Abatement Program", which includes a detailed description of controlling larval and/or adult mosquitoes and approved insecticidal compounds.

## **SURVEILLANCE AND RESPONSE**

**Goal:** To monitor the levels of virus activity, vector populations, infections in vertebrate hosts and human cases in Kern County. The goal is also to improve the ability of the county to predict changes in the transmission dynamics of the virus.

### **I. Mosquito Surveillance**

Four Mosquito Abatement Districts covering parts of Kern County have been effectively monitoring mosquito-borne viruses for over 35 years through their existing vector surveillance and control programs. These efforts are seamlessly linked to local, statewide and national disease tracking efforts. See Appendix 'B' for details on "Surveillance of WNV" and Appendix 'C' describing "State of California Arbovirus Surveillance Program." Eastern Kern County (except for Lake Isabella, which is covered by South Fork Mosquito Abatement District, and Rosamond, which is covered by Antelope Valley Mosquito Abatement District) is not covered by any of the Mosquito Abatement Districts and does not have an active surveillance program. See Appendix 'D' for map of Mosquito Abatement Districts.

#### **A. Routine Surveillance**

1. Mosquito Abatement District's staff traps adult mosquitoes in their covered areas by setting out CDC carbon dioxide-baited or gravid traps at numerous locations regularly from April through October in order to monitor known mosquito-breeding locations in the County. This monitoring may involve regular site visits or be in response to citizen inquiries or complaints. Breeding activity is verified by visual observation, trapping and/or larval collection from water sources using dipping equipment.
2. Samples of adult female mosquitoes from the covered areas are sent to the University of California in order to test for the presence of mosquito-borne diseases.
3. Sentinel chicken flocks (10 birds per flock), located near mosquito breeding areas are bled biweekly from April through October. Blood samples are taken from these sentinel chickens by pricking their combs. Filter strips (used to collect the samples) are then sent to the University of California and tested for the presence of mosquito-borne diseases.
4. When the public reports a dead bird, they are directed to call the California Department of Public Health (CDPH) WNV number 877-WNV-BIRD (877-968-2473). Operators determine if the bird should be picked up for WNV testing based on estimated time of death (e.g. less than 24 hours) and local agency resource availability. If the suspect bird should be picked up, CDPH will notify the appropriate agency to pick up the bird and send it to a CDPH laboratory for testing. There are limited resources for this service to take place in areas not covered by Mosquito Abatement Districts. Both dead bird reports and dead bird testing results are used in assessing WNV risk.
5. The Mosquito Abatement Districts will be prepared to accept and process reports from the public regarding suspect situations in their respective areas where mosquitoes may be breeding (pools, septic systems), help enforce environmental control measures, and respond to media inquiries as appropriate. The appropriate code compliance agency may get involved if needed.

#### **B. Notification of (non-human) Positive WNV**

1. The Kern County Department of Public Health, Mosquito Abatement Districts, and Kern County Environmental Health Services Department (KCEHSD) are notified by CDPH of a Mosquito Pool(s) or Wild Bird(s) testing positive for, and/or a Sentinel Chicken(s) sero-converting for WNV.
2. The Mosquito Abatement District may send staff to investigate the site(s). They will determine the probable presence of *Culex* species or other vector mosquitoes breeding in and/or near the probable site(s) of exposure, collect larval samples if possible, note any dead or morbid birds in the area, and the presence of susceptible humans. Adult mosquito collection traps may be set to determine the abundance of mosquito species in the locality.
3. If requested by KCDPH, the Mosquito Abatement District's staff will prepare a report to include: past history and current findings of adult species and their abundance at and/or near the site of probable infection, species and abundance of larvae at breeding sources at or near the site, and history of reported human cases of mosquito-borne encephalitis at or near the site. The Health Officer in collaboration with the KCEHSD Director, may decide to issue a news release informing the public of WNV activity. Other key agencies (See Appendix E) will be notified if appropriate.

## **II. WNV Human Case Surveillance**

### **A. Notification of Report of Human Case(s) of WNV**

1. KCDPH receives information from health providers or laboratories regarding a suspected or confirmed human case(s) diagnosed with WNV occurring in the county. See Appendix 'G' for "Surveillance Case Definition for WNV Infection in Humans."
2. The Health Officer and Director of Disease Control/Deputy Health Officer are notified of the first pending WNV case investigation of the season.
3. In the event of WNV or other mosquito-borne disease activity in the county, parties reporting viral encephalitis and aseptic meningitis of unknown etiology, will be contacted to determine if WNV testing (or other mosquito-borne disease) has been done.
4. KCDPH will notify the Mosquito Abatement Districts and KCEHSD of WNV case numbers and residences of cases for mosquito surveillance purposes.

### **B. Conduct Surveillance and Investigation of Human Case(s) of WNV**

1. KCDPH will contact the health care provider, appropriate laboratory and/or infection control specialist and obtain relevant physicians' notes, admission and discharge notes (if the case is hospitalized) and laboratory results.
2. KCDPH will contact the case in order to do an interview and complete the case history.
3. An environmental evaluation of the Kern County neighborhood or suspected exposure location will be conducted. A team including relevant agencies will determine ongoing transmission hazards and identify conditions that warrant remediation.
4. The Health Officer and Director of Disease Control/Deputy Health Officer will be kept informed of the number of cases of WNV reported and number of cases currently being investigated.
5. The Health Officer and Director of Disease Control/Deputy Health Officer will forward relative information to CDPH for surveillance purposes.

### **C. Role of the Public Health Diagnostic Laboratory, Handling Specimens**

1. The KCDPH receives specimens from local labs, hospitals and reference labs who have completed screening (EIA testing) for WNV that has resulted in a positive result.
2. The KCDPH will do a confirmation test (IFA testing) on any specimen that resulted in an equivocal result.
3. If KCDPH test results are equivocal then the specimen will be sent to the CDPH Viral and Rickettsial Disease Laboratory (VRDL) for confirmation testing.

See Appendix 'H' for "Protocol for Submission of Lab Specimens for Human WNV Testing."

### **D. Blood Collection Center Surveillance**

Every donation received by the Blood Collection Centers is tested for WNV. When a positive result is detected in a donation, the lab notifies the Blood Bank Notification Coordinator. The positive tested donation and any previous donations by the same donor in the previous 120 days

are discarded. The coordinator contacts the donor regarding the results and obtains history information from the donor. The coordinator then reports the positive result to KCDPH. The coordinator has a 72-hour timeline to complete these notifications. KCDPH will forward relative information to CDPH for surveillance purposes.

### **III. Decision to Apply Adult Mosquito Control Applications**

1. If adult *Culex* mosquitoes (or some other species that can transmit disease) are trapped in significant numbers at an investigation site, the Mosquito Abatement District may determine that adult mosquito control applications are necessary.
  - a. If the risk is an isolated incident/area, (i.e. “green” pool, standing water) an attempt will be made to remediate.
  - b. If the risk is a larger affected area, a decision may be to apply an application to control adult mosquitoes.
2. A 24-hour notice does not have to be given when fogging applications are conducted by ground equipment in residential areas or when recreational areas (such as golf courses or parks) are treated after normal operational hours.
3. If aerial adult mosquito control applications are considered an option, the Mosquito Abatement District will review the information with the Health Officer.
4. A 24-hour notification (via media release) when possible will be given to residents (in the treatment area) prior to an aerial adult mosquito control application. Drafts of media releases and maps where applications will be made will be developed. The Health Officer will give final approval before the information is released to the media. See Appendix ‘F’ for “Sample Press Release”.
5. The Health Officer, and/or the Mosquito Abatement District will notify the Board of Supervisors and the appropriate city/county political jurisdiction officials of the intent/justification to conduct aerial adult mosquito control applications. Written authorization for application over the affected jurisdictions will also be obtained. (This is necessary for the commercial applicator to obtain the required permits).
6. The Health Officer, and/or the Mosquito Abatement District will notify law enforcement of specific location(s) of aerial adult mosquito control applications.

### **IV. Horse Case Surveillance**

1. Kern County Department of Agriculture and Measurement Standards (KCDAMS) receives reports of confirmed horse cases positive for WNV from the California Department of Food and Agriculture (CDFA).
2. KCDAMS will notify KCDPH, KCEHSD, and the Mosquito Abatement Districts of any confirmed cases of WNV in horses as they are reported.

## **REMEDICATION**

**Goal:** To reduce mosquito breeding locations countywide by attaining compliance with existing regulatory requirements. Legal and regulatory authority is detailed in Appendix ‘J’.

In all instances, the Mosquito Abatement District’s vector surveillance control programs will seek voluntary compliance. In the event that voluntary compliance cannot be attained, the

Mosquito Abatement Districts will work with property owners, public agencies and municipalities to assure appropriate remediation of potentially hazardous sites to protect public health. Code Compliance Agencies will be notified to assist with specific issues as appropriate. Government agencies have the authority to enforce established ordinance codes and can order property owners to comply with those ordinances. Code Compliance Agencies and the KCEHSD may order abatement of public nuisances that contribute to vector breeding, harborage or which are deemed an imminent public health threat by the County Health Officer, the KCEHSD or the authorized public official.

## **PUBLIC EDUCATION**

**Goal:** To educate and inform Kern County residents about WNV and general mosquito control activities.

KCDPH will take the lead in providing a targeted outreach and media campaign for WNV. KCEHSD and the Mosquito Abatement Districts will be consulted and will contribute information as needed to the campaign.

A targeted outreach and media campaign may include but not be limited to the following:

- Regular dissemination of WNV information (in both English and Spanish) to the public including:
  - Prevention information such as elimination of standing water around homes and use of personal protection measures.
  - Signs and symptoms of WNV including signs and symptoms of encephalitis or meningitis and the importance of seeking medical care if needed.
  - How to report dead birds, standing water in the community, or illnesses. (See Appendix L)
  - Notification of any pesticide applications if appropriate.
- A full-scale media campaign when needed with Public Service Announcements (PSA) on local television stations and radio stations utilizing developed PSAs and infomercial.
- Routine notifications to health care providers and veterinarians.
  - WNV activity in the County.
  - Personal protection recommendations.
- Routine communication with KCEHSD and the Mosquito Abatement Districts keeping them up-to-date with WNV outreach and surveillance activities.
- Frequent notification of key agencies (Appendix E) of the presence of WNV activity.
- Increased education of county staff involved with WNV outreach and surveillance activities so they can provide additional education to the public regarding WNV and so they can make sure they are protecting themselves from injury and illness. See Appendix 'K' - Personnel Safety.
- Notification of retailers selling DEET products to display products in end-caps to increase visibility and include information about WNV if willing.
- Notification of Bakersfield Association of Realtors regarding the status of WNV activity and solicit their assistance in reporting standing water and "green" pools in the community.
- A dedicated WNV website kept up-to-date with current WNV activities ([www.co.kern.ca.us/health/wnv.asp](http://www.co.kern.ca.us/health/wnv.asp)).

## **INTER-AGENCY AUTHORITY AND COMMUNICATION PROTOCOLS**

**AUTHORITY:** The California Health and Safety Code (HSC) authorizes the County Board of Supervisors to preserve and protect the public health (HSC §101025) and requires the County Health Officer to take any measure necessary to prevent the spread of disease (HSC §120175). Additionally, the County Health Officer and the Director of Environmental Health are authorized to enforce and observe orders and ordinances of the Board of Supervisors, including orders to quarantine, and other regulations of the California Department of Health Services, and public health statutes (HSC §101030, 101280 and Title 17, CCR §1369). The Disease Control Program and the Kern County Public Health Laboratory of the Department of Public Health are authorized by the Health Officer to respond to events having public health significance. The Kern County Animal Control is authorized to enforce orders and ordinances of the Board of Supervisors pertaining to the health of animals and to establish, maintain and quarantine, sanitary, testing and immunizing measures, to promulgate necessary rules and regulations, and to supervise examination and testing of animals or premises for the presence of contagious, infectious or communicable diseases.

**PURPOSE:** To protect the public health, safety and welfare of County residents and visitors through rapid recognition, investigation, surveillance, prevention and control (hereinafter referred to as response) of vector borne illnesses.

### **PROTOCOL:**

1. The KCDPH, KCEHSD, the Mosquito Abatement Districts, and KCDAMS concur that rapid response to WNV and other mosquito-borne viral encephalitis is of high priority.
2. Accordingly, the KCDPH, KCEHSD, the Mosquito Abatement Districts, and KCDAMS shall take necessary administrative and operational measures to ensure immediate interdepartmental notification and communication, and immediate implementation of joint and separate response activities. If there are not sufficient resources available during a particular seasons, the agencies will work together to determine what the needs are and seek additional funding to try to meet the need.
3. The West Nile Virus Task Force involving the key agencies involved with WNV surveillance and control will meet at least annually at the beginning of the season (March) to review the response plan, evaluate resources and needs and discuss potential activities for the season.
4. The KCDPH is the lead for human case surveillance and investigation; the KCDPHL is the lead for human case testing; and the Mosquito Abatement Districts are the leads for vector and animal sentinel surveillance and for vector control in their covered geographical areas. There still remains a large geographical area of the County that is not covered. KCDAMS is the lead for horse surveillance activities. To the greatest extent possible, upon receipt of information of a confirmed or suspected occurrence of WNV or other mosquito-borne infections, interdepartmental communication and joint and separate response activities shall be immediately initiated.
5. Confidential information may be shared as needed among the KCDPH, KCEHSD, Mosquito Abatement Districts, and KCDAMS to conduct the necessary investigation. Any confidential information, such as that contained in a citizens complaints, confidential morbidity reports, internal documents, interview notes and laboratory results, is protected

from unauthorized release. Only the originating department is authorized to release such documents.

6. All inquiries made in any form relating, or potentially leading, to litigation shall be referred to the respective Health Officer, Director of Environmental Health Services, County Administrative Office and the County Counsel or designated representative for appropriate referral and/or response. Certain legal inquiries may require assistance from County Counsel's Office, as determined by the Health Officer, Director of Environmental Health Services or County Administrative Officer.
7. Determination of whether declaration of a local emergency should be considered by the County Board of Supervisors.
8. Determination of whether declaration of a "State of Emergency" should be considered by the Governor at the request of the Board of Supervisors.

## Appendix 'A' – Characterization of Conditions and Responses

### Level 1: Normal Season Conditions

#### CONDITIONS

- No virus infection detected in mosquitoes
- No seroconversions in sentinel chickens
- No WNV infected dead birds
- No human cases

#### RESPONSE

- Conduct routine public education
- Conduct routine mosquito and virus surveillance activities
- Conduct routine mosquito larval control
- Inventory pesticides and equipment
- Evaluate pesticide resistance in vector species
- Ensure adequate emergency funding
- Release routine press notices
- Send routine notifications to physicians and veterinarians

### Level 2: Emergency Planning

#### CONDITIONS

- One or more virus infections detected in *Culex* mosquitoes (MIR / 1000 is <5)
- One or more seroconversions in single flock or one to two seroconversions in multiple flocks in specific region
- One to five WNV positive dead birds in specific region
- One human case

#### RESPONSE

- Enhance public education (include messages on the signs and symptoms of encephalitis; seek medical care if needed; inform public about pesticide applications if appropriate)
- Enhance information to public health providers
- Conduct epidemiological investigations of cases of equine or human disease
- Increase surveillance and control of mosquito larvae
- Increase adult mosquito surveillance
- Increase number of mosquito pools tested for virus
- Conduct localized chemical control of adult mosquitoes

### Level 3: Epidemic Conditions

#### CONDITIONS

- Virus infections detected in multiple pools of *Culex tarsalis* or *Cx. pipiens* mosquitoes (MIR / 1000 > 5)
- More than two seroconversions per flock in multiple flocks
- More than five WNV positive dead birds and multiple reports of dead birds

## Appendix 'A' – Characterization of Conditions and Responses (continued)

- More than one human case

### RESPONSE

- Conduct full scale media campaign
- Alert physicians and veterinarians
- Conduct active human case detection
- Conduct epidemiological investigations of cases of equine or human disease
- Continue enhanced larval surveillance and control of immature mosquitoes
- Broaden geographic coverage of adult mosquito surveillance
- Accelerate adult mosquito control if appropriate
- Determine whether declaration of a local emergency should be considered by the Kern County Board of Supervisors (or KCDPH Health Officer)
- Determine whether declaration of a “State of Emergency” should be considered by the Governor at the request of designated county or city officials
- Determine whether to activate a Standardized Emergency Management System (SEMS) plan at the local or state level
- Continue mosquito education and control programs until mosquito abundance is substantially reduced and no additional human cases are detected

## Appendix 'B'—Surveillance of WNV

**Immature Mosquito Surveillance:** A "dipper," or long-handled ladle, is used to find immature stages (larvae and pupae) of mosquitoes in various water sources. MAD technicians inspect these known breeding habitats and search for new sources for mosquitoes on a seven to 14-day cycle. These data are used to direct control operations. Maintaining careful records of immature mosquito occurrence and abundance, developmental stages treated, source size, and control effectiveness can forecast the size of an adult population. Immature stages of *Culex tarsalis* can be found throughout California in a wide variety of aquatic sources, ranging from clean to highly polluted waters. Other mosquito species, such as the house mosquito, *Culex pipiens*, may play an important role in the transmission cycle of mosquito-borne diseases in urban and suburban areas in Kern County.

**Adult Mosquito Surveillance:** Two adult mosquito-sampling methods are currently used in Kern County. One is the New Jersey light trap and the other is the carbon dioxide-baited trap. New Jersey light traps are placed near known mosquito breeding habitats. These traps monitor the species and abundance of mosquitoes collected from April through October. Approximately 20-30 dioxide-baited traps are put out overnight bi-weekly along prescribed river runs, by lagoons, and other localities that have been shown or have a potential for breeding mosquitoes. These are put out from April to October. Specimens of *C. tarsalis* and other species of *Culex* are pooled (50 per pool) and sent to CDHS for virus testing. Monitoring the abundance of adult mosquito populations also provides important information on the effectiveness of larval control efforts and the abundance of certain species of mosquitoes, which is a key factor when evaluating the risk of disease transmission to humans.

**Mosquito-borne Infections:** Early detection of virus activity may be accomplished by testing adult mosquitoes for virus infection. Since *Culex tarsalis* is the primary vector for mosquito-borne viruses in California, surveillance efforts emphasize the testing of mosquitoes of this species. In other states, *Culex* species also have been shown to be the primary vector associated with human cases caused by WNV. Female mosquitoes are trapped, usually using carbon dioxide-baited traps, and pooled into groups of 50 females each for submission to the laboratory at Davis Arbovirus Research Unit (DARU), which is part of the UC Davis Center for Vector Borne Disease Research. Since 2000, the state surveillance system has been designed to detect WNV and other mosquito-borne viruses. Testing adult mosquitoes for infection is one of the best methods to detect newly introduced mosquito-borne viruses such as WNV.

**Avian Infections:** Detection of transmission of mosquito-borne viruses in bird populations in the areas of the county covered by Mosquito Abatement Districts is being accomplished by using chickens as sentinels and bleeding them to detect viral antibodies (seroconversions), or by collecting and bleeding wild birds to detect viral antibodies in populations. In the County of Kern, 20 flocks of ten chickens each are placed in pens in locations where mosquito abundance is known to be high or where there is a history of virus activity. Each chicken is bled bi-weekly by pricking the comb and collecting blood on a filter paper strip. The blood is tested at CDHS for antibodies to WNV and other mosquito-borne viruses. Biweekly bleeding of carefully placed flocks of sentinel chickens provides the most sensitive and cost-effective method to monitor the activity of these viruses.

## Appendix 'B'—Surveillance of WNV (continued)

Dead bird surveillance was initiated by CDPH in 2000 to provide early detection of WNV. Dead bird surveillance has been shown to be one of the earliest indicators of WNV activity in a new area, and in 2006 the dead bird surveillance program detected the presence of WNV before other surveillance elements in 38 of the 54 counties that detected WNV (out of a total of 58 California counties). Birds that meet certain criteria are necropsied at the California Animal Health and Food Safety Laboratory and tested for WNV by RT-PCR at CVEC or by rapid antigen tests by local agencies. In 2006, a total of 46,345 dead birds were reported to CDPH's dead bird hotline (1-877-WNV-BIRD) and website, [westnile.ca.gov](http://westnile.ca.gov). Of the 6,535 birds that were tested, 1,446 were positive for WNV.

In 2005, CDPH instituted use of a Dynamic Continuous-Area Space-Time (DYCAST) model to identify areas of increased WNV activity in space and time based on the occurrence of dead bird reports. This model was developed in cooperation with the Center for Advanced Research of Spatial Information at Hunter College, City University of New York. Maps were made available to 17 participating mosquito and vector control agencies via a password-protected website. Local agencies used the maps to help focus surveillance and public education activities, and to help establish mosquito control priority with a known onset date and that could be geo-coded within the participating areas (332), 274 (83%) occurred within the quarter square mile areas that were identified areas for reducing WNV enzootic activity and therefore the risk of human infection. In 2006, of those human cases occurring in areas determined by the DYCAST system to be high WNV activity, one hundred sixty-six (50%) human cases occurred in areas identified in these areas approximately one month prior to onset, indicating that DYCAST may be an effective tool in assisting mosquito control agencies to identify areas of high WNV activity.

In 2006, CDPH developed daily DYCAST maps for the entire state and made them available on the CVEC Surveillance Gateway website; a real-time alert system was also introduced to provide high WNV activity counties with custom reports about WNV transmission. A majority of local agencies reported that they used DYCAST maps to assist in decision-making processes for mosquito larviciding (81%, 35 out of 43 local agencies) and adulticiding (71%, 30 out of 42 local agencies). In 2007, the DYCAST procedure is being run for the entire state of California, and daily maps will be made available online through the California Vector-borne Disease Surveillance Gateway (<http://surv.mvcac.org>) from May through August.

**Equine Infections:** Currently, equine disease due to WEE (Western Equine Encephalitis) is not a sensitive indicator of epizootic (the occurrence of infections in animals other than humans) activity in California because of the widespread vaccination of equines (horses, donkeys, and mules) against WEE virus. A similar scenario has unfolded for WNV as horse owners vaccinate to protect their horses. If confirmed cases do occur, it is a strong indication that WEE or WNV has amplified to levels where tangential transmission has occurred in that region of the State. Veterinarians are contacted annually by CDPH and the California Department of Agriculture (CDFA) to advocate equine vaccination and to describe diagnostic services that are available in the event of a suspected case of WEE or WNV encephalitis. Other mosquito-borne viruses may also cause encephalitis in horses, and testing of equine specimens for these other viruses is available.

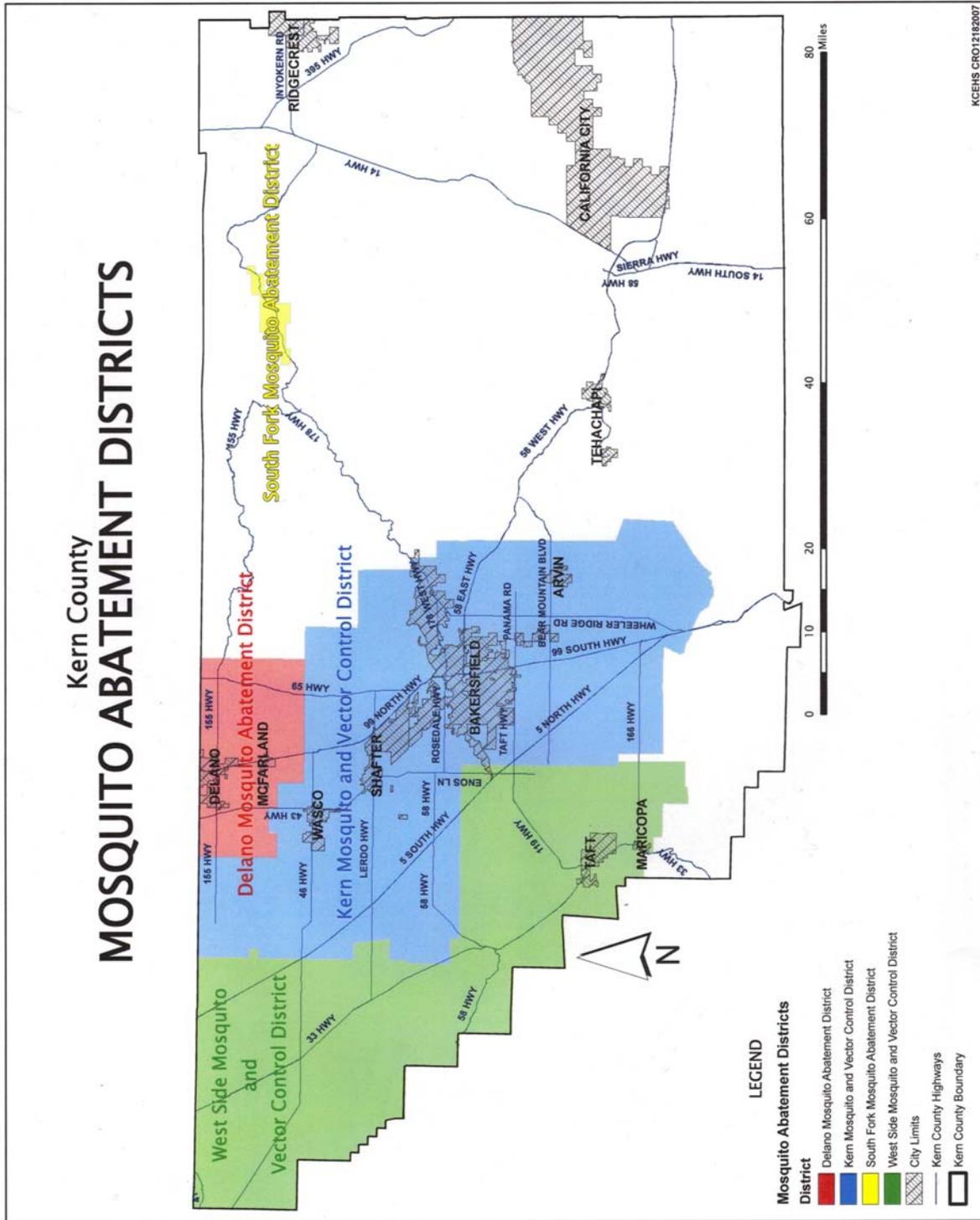
## **Appendix ‘B’–Surveillance of WNV (continued)**

**Human Infections:** Local mosquito control agencies rely on the rapid detection and reporting of confirmed human cases to plan and implement emergency control activities to prevent additional infections. However, human cases of arboviral infection are an insensitive surveillance indicator of virus activity because most human infections cause no, or only mild, symptoms. The focus of human WNV, SLE and WEE surveillance is on severe cases, e.g. encephalitis or aseptic meningitis. In an attempt to increase detection of human SLE, WEE, and WNV cases in California, communication with key hospitals and local health officials has been enhanced. Physicians and health care providers are informed of the availability of WNV and other arbovirus testing through the regional public health laboratory network, which consists of the state Viral and Rickettsial Disease Laboratory and 29 county public health laboratories that are able to conduct WNV testing. Providers may also submit specimens to the California Encephalitis Project, which includes testing for WNV and other arboviruses when indicated. Physicians are required to report cases of viral encephalitis, viral meningitis, or WNV fever to their local health department. Laboratories are also required to report positive results for arboviral encephalitis and WNV (Title 17 Sections 2500 and 2505). Since transmission may occur from blood or transplanted organs, blood banks and organ transplantation programs have also begun screening procedures and report positive results to local health departments. Confirmed WNV, SLE or WEE cases will be investigated by local or state health officials to determine if the infection was acquired locally, imported from a region outside the patient’s residence, or acquired by a non-mosquito route of exposure such as blood transfusion, organ donation, or previously unidentified exposure sources.

## **Appendix 'C' - State of California Arbovirus Surveillance Program**

The California Department of Public Health Arbovirus Surveillance Program emphasizes forecasting and monitoring WNV and other mosquito-borne viruses. These viruses are maintained in nature in wild bird and mosquito cycles, and therefore are not dependent upon infections of humans or domestic animals for their persistence. In California, surveillance and control activities focus on this cycle, which involves primarily species of mosquitoes belonging to the genus *Culex*, particularly *C. tarsalis* and *pipiens* (*both are prevalent in Kern County*), and various species of birds, particularly house finches and sparrows, and those in the crow family. Routine surveillance in the County of Kern includes the monitoring of immature and adult mosquitoes and detecting virus activity by testing (1) mosquitoes, (2) sentinel chickens and wild birds, (3) horses, and (4) humans. These specimens and/or samples are sent to CDPH where they are tested for WNV and other mosquito-borne viruses.

Appendix 'D' - Mosquito Abatement Map





**Appendix ‘E’– Key Contact People/Agencies**

<b>Board of Supervisors</b>	<b>Telephone Number</b>	<b>Email</b>
District 1 Jon McQuiston	661-868-3650	<a href="mailto:district1@co.kern.ca.us">district1@co.kern.ca.us</a>
District 2 Don Maben	661-868-3660	<a href="mailto:district2@co.kern.ca.us">district2@co.kern.ca.us</a>
District 3 Mike Maggard	661-868-3670	<a href="mailto:district3@co.kern.ca.us">district3@co.kern.ca.us</a>
District 4 Ray Watson	661-868-3680	<a href="mailto:district4@co.kern.ca.us">district4@co.kern.ca.us</a>
District 5 Michael Rubio	661-868-3690	<a href="mailto:district5@co.kern.ca.us">district5@co.kern.ca.us</a>

<b>County Departments/Contact Person</b>	<b>Telephone Number</b>	<b>Email</b>
KCDPH- Director: John Nilon	661-868-0301	<a href="mailto:jnilon@co.kern.ca.us">jnilon@co.kern.ca.us</a>
KCDPH- Interim Health Officer Claudia Jonah, M.D.	661-868-0310	<a href="mailto:jonahc@co.kern.ca.us">jonahc@co.kern.ca.us</a>
KCEHSD-Director: Matthew Constantine	661-862-8702	<a href="mailto:mattc@co.kern.ca.us">mattc@co.kern.ca.us</a>
County Administrative Office: CAO: Ronald Errea	661-868-3198	<a href="mailto:errear@co.kern.ca.us">errear@co.kern.ca.us</a>
KC Animal Control Department- Director, Denise Haynes	661-868-7102	<a href="mailto:haynesd@co.kern.ca.us">haynesd@co.kern.ca.us</a>
Kern County Agriculture and Measurement Standards-Director Ruben Arroyo	661-868-6300	<a href="mailto:arroyor@co.kern.ca.us">arroyor@co.kern.ca.us</a>
Kern County Engineering and Survey Services – Director Charles Lackey	661-862-5075	<a href="mailto:chuckl@co.kern.ca.us">chuckl@co.kern.ca.us</a>

**Appendix ‘E’– Key Contact People/Agencies (continued)**

<b>Vector Control Districts</b>	<b>Telephone Number</b>	<b>Email</b>
<b>Kern Mosquito Vector Control District</b> Serving Bakersfield and surrounding areas of Southern Kern County, including Arvin, Greenfield, Lamont, Weedpatch, Rosedale, Buttonwillow, Shafter and Wasco areas	Rob Quiring 661-589-2744	robquiring@sbcglobal.net
<b>Westside Mosquito Vector Control District</b> Serving the westside of Kern County including Taft, Derby Acres, Valley Acres, Maricopa, McKittrick and Belridge areas	Don Black 661-763-3510	wsm.mosq@wildblue.net
<b>Antelope Valley Mosquito Abatement District</b> Serving Rosamond, Lancaster and portions of the Antelope Valley	Cei Kratz 661-942-2917	cei@avmosquito.org
<b>Delano Mosquito Abatement District</b> Serving Delano, McFarland, Richgrove, Pond and Earlimart areas	Gary Johnson 661-725-3114	gmjwascoca@msn.com
<b>South Fork Mosquito Abatement District</b> Serving the South Fork of Lake Isabella area	Duane Lantsberger 760-376-4268	

<b>Other Agencies/Contact People</b>	<b>Telephone Number</b>	<b>Email</b>
Kern County Farm Bureau: Matthew Park, Executive Director	661-397-9635	kcfb@kerncfb.com
Kern County Water Agency: Jim Beck, General Manager	661-634-1503	jbeck@kcwa.com
Edwards Air Force Base: Milt Riley	661-277-2431	milton.riley@edwards.af.mil
California Department of Food and Agriculture (CDFA) -CDFA Animal Health Branch (AHB) Sacramento Headquarters	916-654-1447	cavet@cdfa.ca.gov
California Department of Food and Agriculture (CDFA) -CDFA Animal Health Branch (AHB): Tulare District Office	559-685-3500	mswartz@cdfa.ca.gov
California Department of Public Health, Vector-Borne Disease Section Richard Davis, Senior Biologist	805-929-5377 916-552-9730	rdavis@cdph.ca.gov
Bakersfield Association of Realtors Linda Vernon	661-635-2300	linda@bakersfieldrealtor.com
Kern County Superintendent of Schools: Superintendent: Larry Reider	661-636-4000	lareider@kern.org
Kern High School District: Director School Support Services/Athletics: Mark Wyatt	661-827-3100	mark_wyatt@khsd.k12.ca.us
Kern High School District: Director Pupil Personal Services: Alan Paradise	661-827-3100	alan_paradise@khsd.k12.ca.us

**Appendix 'F' - Sample PRESS RELEASE**

**NOTIFICATION OF MOSQUITO ADULTICIDE APPLICATION**

# **County of Kern**

DEPARTMENT OF PUBLIC HEALTH  
1800 Mt. Vernon Avenue,  
Bakersfield, CA 93306-2412  
(661) 868-0554  
(661) 868-2888 (fax)  
1 -800-253-9933  
[www.co.kern.ca.us/health](http://www.co.kern.ca.us/health)

**IMPORTANT NOTICE**

Date: \_\_\_\_\_

Personnel from a Mosquito Abatement District will be fogging for adult mosquitoes in your neighborhood the evening of \_\_\_\_\_, if winds are calm. It is possible the fogging will be repeated in three days if weather permits. The fogging will be conducted between the hours of \_\_\_\_\_ and \_\_\_\_\_. The general boundaries of the application area are: North of \_\_\_\_\_, south of \_\_\_\_\_, west of \_\_\_\_\_, east of \_\_\_\_\_.

This action is being taken as part of an intensified effort to reduce the population of adult mosquitoes in the immediate area. The insecticide \_\_\_\_\_ (a natural pyrethrin) will be used for fogging. This product is registered for mosquito control by the Environmental Protection Agency and the California Department of Pesticide Regulation. The active ingredient in this product is derived from chrysanthemum flowers. It is specific to insects and relatively harmless to warm-blooded animals, but because people may have an allergic reaction to it, you are advised to stay indoors during the application. A fogging machine mounted on the back of a pickup truck will apply the insecticide. If you have any questions or want additional information, call the \_\_\_\_\_ Mosquito Abatement District \_\_\_\_\_ - \_\_\_\_\_.

## Appendix ‘G’- Surveillance Case Definition for West Nile Virus Infection in Humans

(Modified from: “CDC. Epidemic/Epizootic West Nile Virus in the United States: Guidelines for Surveillance, Prevention, and Control” at [www.cdc.gov/ncidod/dvbid/westnile/publications.htm](http://www.cdc.gov/ncidod/dvbid/westnile/publications.htm))

### Clinical Description:

Arboviral infections may be asymptomatic or may result in illnesses of variable severity sometimes associated with central nervous system (CNS) involvement. When the CNS is affected, clinical syndromes include aseptic meningitis, myelitides and encephalitis, which are clinically indistinguishable from similar syndromes. Arboviral meningitis is characterized by fever, headache, stiff neck, and pleocytosis in cerebral spinal fluid. Arboviral myelitis is usually characterized by fever and acute bulbar or limb paresis or flaccid paralysis. Arboviral Encephalitis is characterized by fever, headache, and altered mental status ranging from confusion to coma with or without additional signs of brain dysfunction. Less common neurological syndromes can include cranial and peripheral neuritis/neuropathies, including Guillain-Barré syndrome. West Nile fever is a non-specific, self-limited, febrile illness with fever, headache, arthralgias, myalgias, and sometimes accompanied by skin rash or lymphadenopathy. Overlap among the various clinical syndromes are common.

### Case Classification:

Confirmed Case:

A clinically compatible illness, *plus*:

- Serum enzyme immunoassay (EIA) for virus-specific immunoglobulin M (IgM) and confirmed by demonstration of virus-specific serum immunoglobulin G (IgG) antibodies in the same or a later specimen by plaque reduction neutralization (PRNT), or
- Fourfold or greater change in virus-specific antibody titer, or
- Virus-specific immunoglobulin M (IgM) antibodies demonstrated in CSF by antibody capture EIA, or
- Isolation of virus from or demonstration of specific viral antigen or genomic sequences in tissue, blood, cerebrospinal fluid (CSF), or other body fluid.

Probable Case:

A clinically compatible illness, *plus*

- WNV-specific serum IgM antibodies detected by antibody-capture EIA but with no available results of a confirmatory test for virus-specific serum neutralizing antibodies in the same or a later specimen, or
- A single or stable (less than or equal to twofold change) but elevated titer of virus specific serum antibodies.

**Please contact CDPH at (510) 307-8606 for questions regarding case classification.**

## Appendix 'H' - Protocol for Submission of Laboratory Specimens for Human West Nile Virus Testing

West Nile Virus (WNV) testing within the regional public health laboratory network (i.e., the California Department of Health Services Viral and Rickettsial Disease Laboratory and participating local public health laboratories) is recommended on individuals with the following:

- A. Encephalitis
- B. Aseptic meningitis (Note: Consider enterovirus for individuals  $\leq 18$  years of age)
- C. Acute flaccid paralysis; atypical Guillain-Barré Syndrome; transverse myelitis; or
- D. Febrile illness\*
  - Illness compatible with West Nile fever and lasting  $\geq 7$  days
  - Must be seen by a health care provider

-----  
\* The West Nile fever syndrome can be variable and often includes headache and fever ( $T > 38^{\circ}\text{C}$ ). Other symptoms include rash, swollen lymph nodes, eye pain, nausea, or vomiting. After initial symptoms, the patient may experience several days of fatigue and lethargy.

Required specimens:

- Acute serum:  $\geq 2\text{cc}$  serum
- Cerebral spinal fluid (CSF):  $\geq 2\text{cc}$  CSF (**if lumbar puncture is performed; do not obtain CSF for the sole purpose of doing this test**)

If West Nile Virus is highly suspected and acute serum is negative or inconclusive, request:

- 2<sup>nd</sup> serum:  $\geq 2\text{cc}$  serum collected 3-5 days after acute serum

**Contact your local health department for instructions on where to send specimens.**

## Appendix 'I' – Kern County, Mosquito Control & Abatement Program

### Larval Control:

Mosquito Control and Abatement is conducted primarily by local independent Mosquito Abatement Districts. Mosquito larvae and pupae control methods are target-specific and prevent the emergence of adult female mosquitoes which are capable of transmitting pathogens, causing discomfort, and ultimately producing another generation of mosquitoes. For these reasons, most mosquito control agencies in California target the immature stages rather than the adult stage of the mosquito. Larval mosquito control has three key components: environmental management, biological control, and chemical control.

Environmental management decreases habitat availability or suitability for immature mosquitoes, and may include water management, such as increasing the water disposal rate through evaporation, percolation, recirculation, or drainage. Laser leveling of fields precludes pooling at low spots, allows even distribution of irrigation water, and precludes standing water for long periods. Controlled irrigation or the careful timing of wetland flooding for waterfowl can reduce mosquito production or limit emergence to times of the year when virus activity is unlikely. Environmental management may include vegetation management because emergent vegetation provides food and refuge for mosquito larvae. Management strategies include the periodic removal or thinning of vegetation, restricting growth of vegetation, and controlling algae.

Biological control entails the intentional use of natural predators, parasites, or pathogens to reduce immature mosquito numbers. Mosquito fish, *Gambusia affinis*, are the most widely used biological control agent in California.

There are several mosquito control products that are highly specific and thus have minimal impact on non-target organisms. These include microbial control agents, such as *Bacillus thuringiensis israelensis* (Bti) and *Bacillus sphaericus* (Bts), and insect growth regulators, such as methoprene, that prevent immature mosquitoes from developing into adults. Surface films are very effective against both larvae and pupae, but also may suffocate other surface breathing aquatic insects.

### Adult Control:

When larval control is not possible or has been used to the fullest extent possible, adult mosquito control operations may be required to suppress populations of infected mosquitoes and interrupt epidemic virus transmission. Adult mosquito control products may be applied using ground-based equipment, fixed wing airplanes, or helicopters. These products applied in ultralow volume [ULV] formulations and dosages include organophosphates, such as malathion and naled, pyrethroids, such as resmethrin, sumithrin, and permethrin, and pyrethrins such as Pyrenone crop spray. Factors to consider when selecting an adulticide include: 1) efficacy against the target species or life cycle stage, 2) resistance status, 3) pesticide label requirements, 4) availability of pesticide and application equipment, 5) environmental conditions, 6) cost, and 7) toxicity to nontarget species, including humans.

## Appendix 'I'– Kern County, Mosquito Control & Abatement Program (continued)

### Compounds Approved for Mosquito Control in California

Label rates and usage vary from year to year and geographically; consult your County Agricultural Commissioner and the California Department of Fish and Game before application. Examples of products containing specific active ingredients are provided below, but this is not an inclusive list nor constitutes product endorsement. For more information on pesticides and mosquito control, please refer to the Environmental Protection Agency (EPA) Web site: [www.epa.gov/pesticides/factsheets/skeeters.htm](http://www.epa.gov/pesticides/factsheets/skeeters.htm)

<b>Larvacides:</b>	<b>Use:</b>	<b>Limitations:</b>
1. <i>Bacillus thuringiensis</i> subspecies <i>israelensis</i> (Bti: e.g. Aquabac 200G, VectoBac® 12AS, Teknar HP-D)	Approved for most permanent and temporary bodies of water.	Only works on actively feeding stages. Does not persist well in the water column.
2. <i>Bacillus sphaericus</i> (Bs: e.g. VectoLex® CG)	Approved for most permanent and temporary bodies of water.	Only works on actively feeding stages. Does not work well on all species. May persist and have residual activity in some sites.
3. IGRs (Insect Growth Regulators): (S)-Methoprene (e.g. Altosid® Pellets)	Approved for most permanent and temporary bodies of water.	Works best on older instars. Some populations of mosquitoes may show some resistance.
4. IGRs (Insect Growth Regulators): Diflurobenzamide (e.g. Dimilin®25W)	Impounded tail water, sewage effluent, urban drains and catch basins.	Cannot be applied to wetlands, crops, or near estuaries.
5. Larviciding oils (e.g. Mosquito Larvicide GB-1111), BVA oil	Ditches, dairy lagoons, floodwater. Effective against all stages, including pupae.	Consult with the California Department of Fish and Game for local restrictions.
6. Monomolecular films (e.g. Agnique® MMF)	Most standing water including certain crops.	Does not work well in areas with unidirectional winds in excess of ten mph.
<b>Adulticides:</b>	<b>Uses:</b>	<b>Limitations:</b>
1. Pyrethrins (natural pyrethrin products: e.g. Pyrenone® Crop Spray, Pyrenone® 25-5, Evergreen)	Wetlands, floodwater, residential areas, some crops.	Do not apply to drinking water, milking areas; may be toxic to bees, fish, and some wildlife. Some formulations with synergists have greater limitations.
2. Pyrethroids (synthetic pyrethrin products containing deltamethrin, permethrin, resmethrin or sumithrin: e.g. Suspend® SC, Aqua-Reslin®, Scourge® Insecticide, Anvil® 10+10 ULV)	All non-crop areas including wetlands and floodwater.	May be toxic to bees, fish, and some wildlife; avoid treating food crops, drinking water or milk production.

## **Appendix ‘J’ - Legal Authority for Mosquito Control**

The legal authority providing a vector control district routine surveillance, control, and access issues does not require obtaining a permit from regulatory agencies (e.g. California Department of Fish and Game). Permits would be required only if major access issues (i.e. drainage channel alterations) are required, based on location and ownership, for mosquito abatement. The legal authority for the operation of the Vector Surveillance and Control program and the Department of Environmental Health is generally found in the following:

- California Government Code  
Section 25842.5
- California Civil Code  
Sections 3479 and 3480
- California Penal Code  
Sections 372 and 373 (a)
- California Health and Safety Code  
Division 13 – Housing, part 1.5, section 17920.3
- Kern County Ordinance Code:  
Chapter 8.44 – Public Nuisances
- Individual municipalities may have relevant ordinances.

The legal authority for a vector control district is in the Mosquito Abatement and Vector Control District law in the California Health and Safety Code, Section 2000 et seq.

### Notification

Mosquito Abatement District, Vector Surveillance and Control Program, will notify the appropriate agencies when large-scale aerial or land-based mosquito control applications are conducted.

### **California Government Code**

Section 25842.5

(a) The board of supervisors may provide the same services and exercise the powers of mosquito abatement districts or vector control districts formed pursuant to the Mosquito Abatement and Vector Control District Law, Chapter 1 (commencing with Section 2000) of Division 3 of the Health and Safety Code within both the unincorporated and incorporated territory of the county.

(b) Before exercising that authority within incorporated territory, the consent of the city council shall first be obtained. Before exercising the authority granted pursuant to this section, the board of supervisors shall hold a public hearing on the proposal. Notice of the hearing shall be given pursuant to Section 6061 in a newspaper of general circulation in the county.

## **Appendix ‘J’ - Legal Authority for Mosquito Control (continued)**

### **California Civil Code**

Sections 3479 and 3480

3479. Anything which is injurious to health, including, but not limited to, the illegal sale of controlled substances, or is indecent or offensive to the senses, or an obstruction to the free use of property, so as to interfere with the comfortable enjoyment of life or property, or unlawfully obstructs the free passage or use, in the customary manner, of any navigable lake, or river, bay, stream, canal, or basin, or any public park, square, street, or highway, is a nuisance.

3480. A public nuisance is one which affects at the same time an entire community or neighborhood, or any considerable number of persons, although the extent of the annoyance or damage inflicted upon individuals may be unequal.

### **California Penal Code**

Sections 372 and 373 (a)

372. Every person who maintains or commits any public nuisance, the punishment for which is not otherwise prescribed, or who willfully omits to perform any legal duty relating to the removal of a public nuisance, is guilty of a misdemeanor.

373a. Every person who maintains, permits, or allows a public nuisance to exist upon his or her property or premises, and every person occupying or leasing the property or premises of another who maintains, permits or allows a public nuisance to exist thereon, after reasonable notice in writing from a health officer or district attorney or city attorney or prosecuting attorney to remove, discontinue or abate the same has been served upon such person, is guilty of a misdemeanor, and shall be punished accordingly; and the existence of such nuisance for each and every day after the service of such notice shall be deemed a separate and distinct offense, and it is hereby made the duty of the district attorney, or the city attorney of any city the charter of which imposes the duty upon the city attorney to prosecute state misdemeanors, to prosecute all persons guilty of violating this section by continuous prosecutions until the nuisance is abated and removed.

### **California Health and Safety Code**

Division 13 – Housing, part 1.5, section 17920.3

17920.3. Any building or portion thereof including any dwelling unit, guestroom or suite of rooms, or the premises on which the same is located, in which there exists any of the following listed conditions to an extent that endangers the life, limb, health, property, safety, or welfare of the public or the occupants thereof shall be deemed and hereby is declared to be a substandard building:... (Please see Division 13- Housing, part 1.5, section 17920.3 for the complete code)

### **Kern County Ordinance Code Title 8 Health and Safety:**

Chapter 8.44.070 – Public Nuisances Immediate threat to public health or safety.

A. The public official, upon making a finding that an immediate threat or danger exists to the health, safety or welfare of the occupants or the public, may order a summary abatement of the nuisance.

## **Appendix 'J' - Legal Authority for Mosquito Control (continued)**

B. Upon such finding, the public official may require immediate action on the part of the property owner to eliminate the hazardous condition.

1. The public official shall make a reasonable attempt to notify the occupants and owners of the property or responsible party of the dangers which require the immediate vacation, repair, cleanup and/or securing of the property or structures thereof, either by telephone, or by personally visiting the premises; and

2. If the imminently dangerous condition can be substantially relieved by the performance of minor repairs, disconnection of certain utility services, or other acts, then the public official may perform or direct such acts of work without the prior consent of, or notice to, the owners, occupants or responsible party; and

3. If such danger cannot be substantially relieved by such work and upon the failure or refusal of the occupants to voluntarily vacate such premises, then the public official may personally disconnect the electrical, gas and other utility services to such premises or may request the appropriate utility companies to do so; and

4. If the public official finds that an immediate threat to public health, safety or welfare exists, and that it is unhealthy or hazardous to delay abatement action, he/she may order county staff or contractors to abate the condition. Abatement may be, but is not limited to, board-up of structures and securing of property so as to avoid exposure to the hazard, or clean-up and disposal of rubbish or other materials which threaten public health. Where abatement costs are projected to be two thousand five hundred dollars (\$2,500.00) or more, authorization to abate shall be obtained from the board of supervisors prior to the public official ordering the abatement; and

5. The property owner or responsible party shall be liable for all costs associated with this abatement, including administrative, labor, material and other costs; and

6. The public official shall post warnings to all persons not to enter the premises stating the reasons therefore. (Ord. G-6530 § 5 (part), 1998)

## Appendix 'K' - Personnel Safety

Title 8 of the California Code of Regulations (8CCR), §3203, requires that the County have an effective and written Injury and Illness Prevention Program (IIPP). The purpose of the IIPP is to provide better work place protection for employees and to reduce losses resulting from accidents and injuries. All employers are to have an IIPP in place; this is an example of the IIPP used in the KCDPH.

The nine elements required for an effective IIPP are as follows:

- Management commitment and assignment of responsibilities
- A 2-way safety communications system between employer and employee
- A system for assuring employee compliance with safe and healthy work practices
- Scheduled inspection and evaluation of work place hazards
- Procedures for correcting unsafe or unhealthy conditions
- Accident investigation
- Health and safety training and instruction
- Record keeping and documentation

Each of these elements is described in detail in the IIPP. Some of the activities of the “health and safety training and instruction” element include: driver safety, defensive driving; respiratory protection; pesticide use and safety; field identification and protection; heavy equipment hazards; personal protection equipment; field physical hazards; and first aid. These activities may be increased in the event that West Nile or other mosquito-borne viruses are found in mosquitoes, birds, equines, and/or humans. As given in the “management commitment and assignment of responsibilities” element, part of the supervisors’ responsibilities include ensuring that these field activities are performed with the utmost regard for health and safety.

Besides physical hazards, County personnel also may be exposed to an increased risk of being exposed to mosquito-borne diseases, to include WNV. Such individuals should follow the following safety procedures when outdoors:

- Wear clothing that covers the skin such as long sleeve shirts and pants;
- Apply effective insect repellent to clothing and exposed skin;
- Curb outside activity during dawn and dusk.

Additionally, County personnel should do the following:

- If allergic to repellents, contact their doctor for alternative protective measures.
- If bitten by a mosquito and the employee begins to experience fever, headache and body aches usually within 5-15 days following the bite, seek medical attention.
- Survey work site(s) and look for and eliminate standing water, if possible, by tipping over flowerpots, buckets, etc. that contain water.

If dead birds are noticed, call CDPH WNV hotline (661) 862-8700 and they will provide direction concerning these birds possibly being picked up for WNV testing.

## Appendix 'L' – Where to Call

Refer to map and vector control districts

### Green Pool Reporting

Bakersfield Area	661/589-2744
West Side	661/763-3510
Delano	661/725-3114
South Fork	760/376-4268

### Dead Bird Reporting

877/WNV-BIRD

### General WNV Info

KCDPH Health Promotion 661/868-0327

The purpose of collecting and testing dead birds is to find out as early as possible if WNV is in the area. When infection has been identified in an area, there may not be a continued need for collection of birds for testing in that area. If this occurs, please safely dispose of dead birds using the following guidelines.

Do not touch dead birds with your bare hands or bring them indoors, and keep children and pets away. If you have disposable protective gloves, put them on, pick up the bird and put it into a plastic bag. If you do not have any disposable protective gloves, put your hand inside a plastic bag, pick up the bird with your protected hand, and then pull the open end of the bag off your hand and over the bird.

To dispose in household garbage put on gloves or use another inverted bag as above, then put the bag containing the dead bird into the second plastic bag. You can discard disposable gloves by taking them off by turning them inside out and putting them into the second plastic bag. Tie or otherwise seal up the second bag and put it in the trashcan with your normal household garbage. Once you are done, remember to wash your hands thoroughly with soap and water even if you are sure you did not touch the bird.

If you are not in an incorporated area, please contact your city or county code enforcement agencies.

## Appendix 'M' – List of Acronyms

BOS	Board of Supervisors
CDPH	California Department of Public Health
WNV	West Nile Virus
MADS	Mosquito Abatement Districts
KCDPH	Kern County Department of Public Health
KCEHSD	Kern County Environmental Health Services Department
KCESS	Kern County Engineering and Survey Services
IPM	Integrated Pest Management
CDPH	California Department of Public Health
KCDPHL	Kern County Department of Public Health Lab
HPPI	Health Promotion and Public Information
KCDAMS	Kern County Department of Agriculture and Measurement
CDFA	California Department of Food and Agriculture
PSA	Public Service Announcements
DYCAST	Dynamic Continuous-Area Space-Time
WEE	Western Equine Encephalitis
VRDL	Viral and Rickettsial Disease Laboratory

**Signature Page**

The parties signed below attest to their approval of this document as it is written on this date in the existing format. Any recommended changes to the document as written and adopted on this date will need to be submitted in writing to the Director of the Kern County Department of Public Health for review and approved as a revision to this plan by all parties.

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Kern County Department of Public Health

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Matthew Constantine, Director  
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Ruben Arroyo, Agriculture Commissioner  
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Delano Mosquito Abatement District

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Don W. Black, Director  
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South Fork Mosquito Abatement District

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Date