Coachella Valley Mosquito and Vector Control District

43-420 Trader Place • Indio, CA 92201 • (760) 342-8287 • Fax (760) 342-8110
• Toll Free 1-888-343-9399
E-mail: CVmosquito@cvmvcd.org • Website: www.cvmvcd.org

February 26, 2016

Ariana Villanueva, Water Resources Control Engineer
Division of Water Quality
c/o NPDES Wastewater Unit
State Water Resources Control Board
1001 I Street, 15th Floor
Sacramento, CA 95814

RECEIVED
MAR 10 2016
DIVISION OF WATER QUALITY

Re: NOI NPDES Vector Control Permit

Dear Ms. Villanueva,

Please find enclosed our Notice of Intent and Pesticide Application Plan for coverage under the NPDES Vector Control Permit which is expected to be renewed at the March 1 State Water Resources Control Board. You may contact our office with any questions that you have.

Sincerely,

Jennifer A. Henke, M.S.
Interim Scientific Operations Manager

CC: Jeremy Wittie, M.S., General Manager

ATTACHMENT E – NOTICE OF INTENT

WATER QUALITY ORDER 2016-XXXX-DWQ
GENERAL PERMIT CAG990004

STATEWIDE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT FOR BIOLOGICAL AND RESIDUAL PESTICIDE DISCHARGES TO WATERS OF THE UNITED STATES FROM VECTOR CONTROL APPLICATIONS

I. NOTICE OF INTENT STATUS (see Instructions)

Mark only one item	☐ A. New Applicator ☐ B. Change of Information: WDID# _____
	☐ C. Change of ownership or responsibility: WDID# _____
	☒ D. Enrolled under Order 2011-0002-DWQ: WDID# 7000P000007

II. DISCHARGER INFORMATION

A. Name			
Coachella Valley Mosquito and Vector Control District			
B. Mailing Address			
P.O. Box 2967			
C. City	D. County	E. State	F. Zip Code
Indio	Riverside	CA	92202
G. Contact Person	H. Email address	I. Title	J. Phone
Jeremy Wittie	JWittie@cvmvcd.org	General Manager	760 342 8287

III. BILLING ADDRESS (Enter Information *only* if different from Section II above)

A. Name			
B. Mailing Address			
C. City	D. County	E. State	F. Zip Code
G. Email address	H. Title	I. Phone	

IV. RECEIVING WATER INFORMATION

A. Biological and residual pesticides discharge to (check all that apply)*:

☐ 1. Canals, ditches, or other constructed conveyance facilities owned and controlled by Discharger.
Name of the conveyance system: _____

☒ 2. Canals, ditches, or other constructed conveyance facilities owned and controlled by an entity other than the Discharger.
Owner's name: various - see Attachment A
Name of the conveyance system: _____

☒ 3. Directly to river, lake, creek, stream, bay, ocean, etc.
Name of water body: Whitewater River, Salton Sea, and associated tributaries

* A map showing the affected areas for items 1 to 3 above may be included.

B. Regional Water Quality Control Board(s) where application areas are located
(REGION 1, 2, 3, 4, 5, 6, 7, 8, or 9): Region 7
(List all regions where pesticide application is proposed.)

A map showing the locations of A1-A3 in each Regional Water Board shall be included.

V. PESTICIDE APPLICATION INFORMATION

A. Target Organisms: ☒ Vector Larvae ☒ Adult Vector

B. Pesticides Used: List name, active ingredients and, if known, degradation by-products
see Attachment B

C. Period of Application: Start Date Jan. 1 End Date Dec. 31

D. Types of Adjuvants Added by the Discharger:
see Attachment B

VI. PESTICIDES APPLICATION PLAN

A. Has a Pesticides Application Plan been prepared?*
☒ Yes ☐ No

If not, when will it be prepared? _____

* A copy of the Pesticides Application Plan shall be included with the NOI.

B. Is the applicator familiar with its contents?

☒ Yes ☐ No

VII. NOTIFICATION

Have potentially affected governmental agencies been notified?
☒ Yes ☐ No

* If yes, a copy of the notifications shall be attached to the NOI.

VIII. FEE

Have you included payment of the filing fee (for first-time enrollees only) with this submittal?
☒ Yes ☐ NO ☐ NA

IX. CERTIFICATION

"I certify under penalty of law that this document and all attachments were prepared under my direction and supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment. Additionally, I certify that the provisions of the Order, including developing and implementing a monitoring program, will be complied with."

A. Printed Name: Jeremy Wittie

B. Signature: _____ **Date:** 3/7/2016

C. Title: General Manager

X. FOR STATE WATER BOARD USE ONLY

WDID:	**Date NOI Received:**	**Date NOI Processed:**
Case Handler's Initial:	**Fee Amount Received:** $	**Check #:**

Coachella Valley Mosquito and Vector Control District

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February 22, 2016

NOTICE TO SUBJECT/ INTERESTED AGENCIES

State Water Resources Control Board
Colorado River Basin Regional Water Quality Control Board
US Army Corps of Engineers
US Fish and Wildlife Office – Palm Springs
Bureau of Land Management – South Coast Field Office
CDPH – Vector-Borne Disease Section
California Air Resources Board
California Department of Fish & Wildlife, Region 6
Caltrans District 8
Department of Pesticide Regulation
South Coast Air Quality Management District
Senator Jeff Stone
Assemblymember Eduardo Garcia
Assemblymember Chad Mayes
The Honorable Kevin Jeffries
The Honorable John F. Tavaglione
The Honorable Chuck Washington
The Honorable John J. Benoit
The Honorable Marion Ashley
Riverside County Agricultural Commissioner
Riverside County Dept. of Environmental Health
Riverside County Flood & Water Conservation District
County of Riverside County Clerk
Agua Caliente Band of Cahuilla Indians
Augustine Band of Cahuilla Indians
Cabazon Band of Mission Indians
Torres Martinez Desert Cahuilla Indians
Twenty-Nine Palms Band of Mission Indians
City of Cathedral City
City of Coachella
City of Desert Hot Springs
City of Indian Wells
City of Indio
City of La Quinta
City of Palm Desert
City of Palm Springs
City of Rancho Mirage
Coachella Valley Water District
Desert Water Agency
Imperial Irrigation District
Indio Water Authority
Mission Springs Water District
Valley Sanitary District
Coachella Valley Association of Governments
Coachella Valley Mountain Conservancy

Subject: The Coachella Valley Mosquito and Vector Control District Notice of Intent to apply aquatic larvacides and adulticides for vector control as part of the District's Integrated Vector Management program.

Pursuant to the provisions stated in the National Pollutant Discharge Elimination System (NPDES) Permit (Water Quality Order No. 2011-0002-DWQ) [General Permit No. CAG 990004] adopted on March 1, 2011, and revised on April 3, 2012 (Water Quality Order No. 2012-0003-DWQ); March 12, 2014 (Water Quality Order No. 2014-0038-EXEC); and July 2, 2014 (Water Quality Order No. 2014-0106-DWQ), by the State Water Resources Control Board, notice is hereby given that the Coachella Valley Mosquito and Vector Control District (hereafter, the District) intends to continue to perform larvicide, ultra low volume (ULV) adulticide, and barrier adulticide applications as part of its Integrated Vector Management Program. The State Water Resources Control Board has stated that the District will still be in compliance with this permit until July 1, 2016 or until it is approved for compliance under the revised permit. The permit is expected to be approved by the State Water Resources Control Board on March 1, 2016.

Time Period / Purpose:
This notification covers District control measures from March 1, 2016 to December 31, 2016 as needed for the suppression of vector populations and arbovirus transmission when non-chemical strategies aren't feasible. The permit itself will be in effect until February 29, 2016, and the permit is expected to be renewed on March 1, 2016. Each year the district will update interested agencies regarding the control products being used within the District's boundaries.

Application Locations and Application Types:
Application of mosquito control products will be made throughout the Coachella Valley Mosquito and Vector Control District (see District Map; Attachment A) by:

- Ultra Low Volume (ULV) and barrier adulticide applications
- Larviciding applications

Applications are made based on key vector and arbovirus surveillance indicators. All pesticide labeling requirements are complied with during application of vector control products.

Vector Control Products:
The NPDES Permit requirements for listing of the Public Health Pesticides anticipated to be used were modified from the previous permit, to the new permit which will be issued in 2016. The newer requirements specify that any pesticide product can be used that contain approved active ingredients, provided all pesticide label restrictions and instructions are followed. In addition, pesticides which fall under the "minimum risk" category can be used. The minimum risk pesticides have been exempted from FIFRA requirements, and a list of these can be found at http://www.epa.gov/minimum-risk-pesticides/inert-ingredients-approved-use-minimum-risk-pesticide-products. The following tables list the active ingredients approved for the FIFRA regulated pesticides.

Larvicide products are designed to kill larval mosquitoes, and there are no specific water restrictions. Technicians wear appropriate personal protective equipment as required by the pesticide label. Adulticide products are designed to kill adult mosquitoes. While mixing and working with the concentrated amounts of the product, the technicians wear the personal protective equipment as required by the label. The District recommends that during the application of adulticides, residents and pets in the immediate vicinity of treatment should remain indoors with the windows closed during the treatment. The District has posted copies of the labels and the Safety Data Sheets (SDS) on its website (www.cvmvcd.org) for your convenience.

Larvicides

Bacillus thuringiensis subsp. *israelensis (Bti)*
Bacillus sphaericus (Bs)
Methoprene
Monomolecular Films
Petroleum Distillates
Spinosad
Temephos

Adulticides

Deltamethrin
Etofenprox

Lambda-Cyhalothrin
Malathion
Naled
N-octyl bicycloheptene dicarboximide (MGK-264)
Piperonyl butoxide (PBO)
Permethrin
Prallethrin
Pyrethrin
Resmethrin
Sumithrin

Additional Information:
If you have any questions regarding this Notice, please contact the District at 760-342-8287.

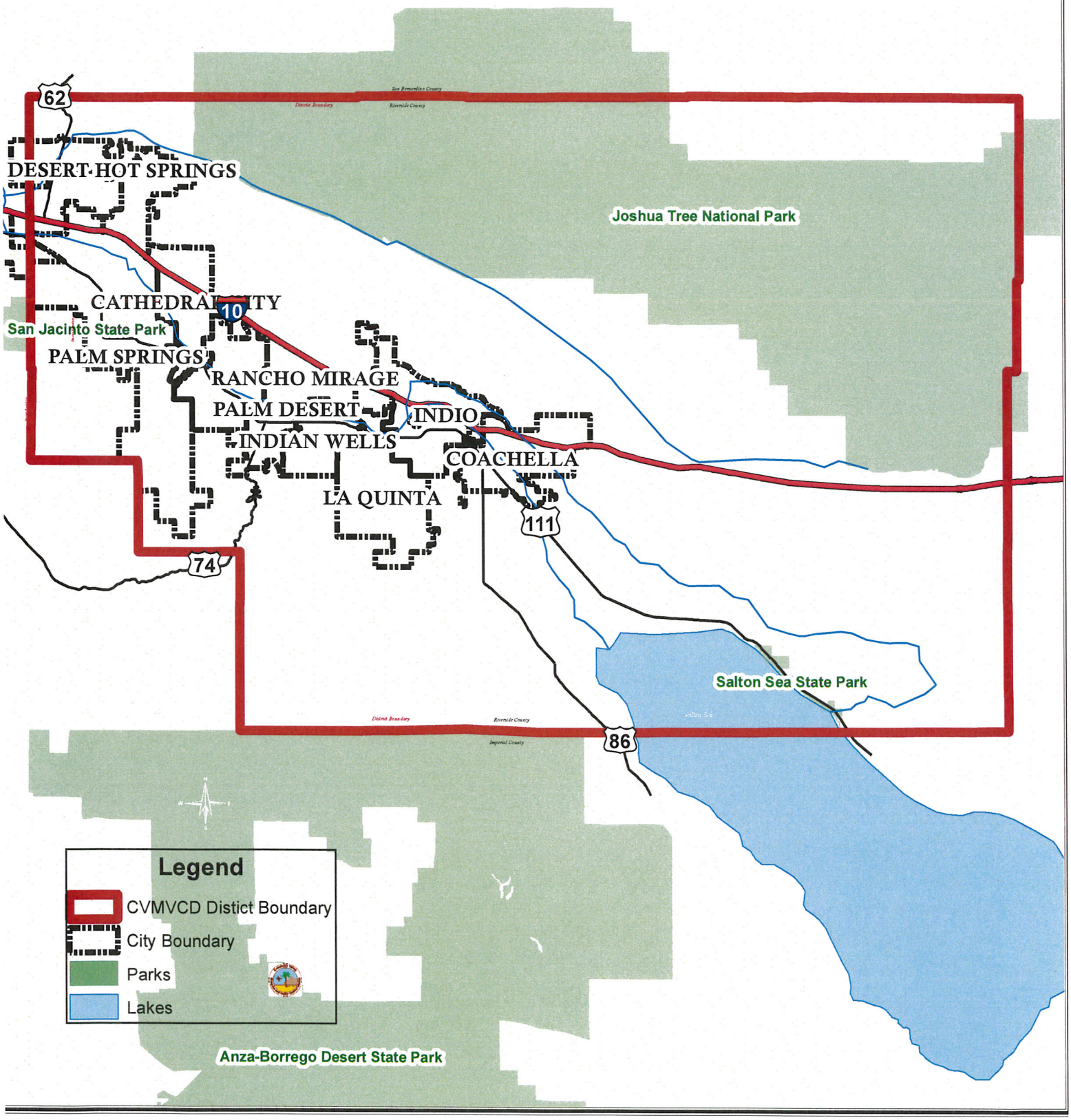
Sincerely,

Jennifer A. Henke, M.S.
Interim Scientific Operations Manager
JHenke@cvmvcd.org

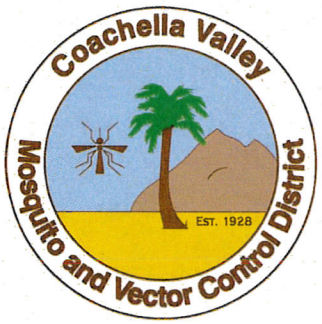
cc: Jeremy Wittie, M.S., General Manager

Encl: CVMVCD Boundary Map

Coachella Valley Mosquito and Vector Control District Boundary



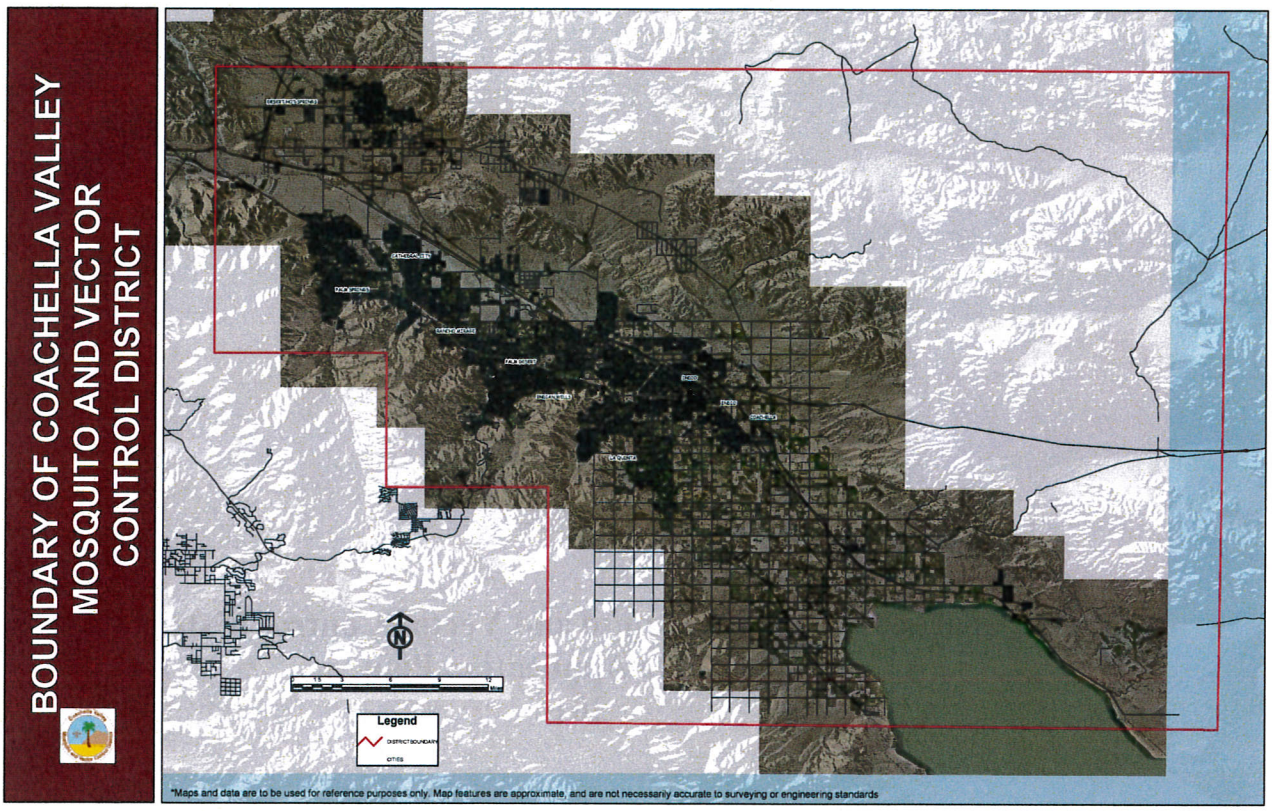
Agency	FirstName	LastName	StreetLine1	City	State	ZIP	Title	Phone	Email
Agua Caliente Band of Cahuilla Indians	Margaret	Park	5401 Dinah Shore Dr	Palm Springs	CA	92264	Director of Planning & Natural Resources, AICP	760 883 1326	mpark@aguacaliente.net
Augustine Band of Cahuilla Indians	Mary Ann	Green	P. O. Box 846	Coachella	CA	92236	Chairperson	760 398 4722	
Bureau of Land Management - South Coast Field Office	John	Kalish	1201 Bird Center Dr	Palm Springs	CA	92262	Field Manager	760 833 7100	jkalish@blm.gov
Cabazon Band of Mission Indians	Doug	Welmas	84-245 Indio Springs Parkway	Indio	CA	92203	Tribal Chairman	7603422593	
Cabazon Band of Mission Indians	Jacquelyn	Gonzales	84-245 Indio Springs Parkway	Indio	CA	92203	GIS/Water Compliance Specialist	760 238 5770	jgonzales@cabazonindians-nsn.gov
California Department of Fish and Wildlife, Region 6	Leslie	MacNair	3602 Inland Empire Blvd, Suite C-220	Ontario	CA	91764	Regional Manager	909 484 0167	AskRegion6@dfg.ca.gov
California Department of Fish and Wildlife, Region 6			78078 Counry Club Dr, Suite 109	Bermuda Dunes	CA	92203		760 200 9158	
California Department of Public Health	Vicki	Kramer	P. O. Box 997377, MS 7307	Sacramento	CA	95899-7377	Vector-Borne Disease Section	916 552 9730	vicki.kramer@cdph.ca.gov
California Department of Transportation, District 8	John	Bulinski	464 West 4th St	San Bernardino	CA	92402	Director	909 383 4561	
City of Cathedral City	Charles P.	McClendon	68-700 Avenida Lalo Guerroro	Cathedral City	CA	92234	City Manager	760 770 0372	jmeza@cathedralcity.gov
City of Cathedral City	Robert	Rodriguez	68-700 Avenida Lalo Guerroro	Cathedral City	CA	92234	Development Services Manager, Planning Department	760 770 0344	rrodriguez@cathedralcity.gov
City of Coachella	David	Garcia	1515 Sixth St	Coachella	CA	92236	City Manager	760 398 3502	dgarcia@coachella.org
City of Desert Hot Springs	Martin	Magana	65-950 Pierson Blvd	Desert Hot Springs	CA	92240	City Manager	760 329 6411	CityManager@cityofdhs.org
City of Indian Wells	Wade G.	McKinney	44-950 Eldorado Drive	Indian Wells	CA	92210-7497	City Manager	760 346 2489	wmckinney@indianwells.com
City of Indio	Dan	Martinez	100 Civic Center Mall	Indio	CA	92201	City Manager	760 391 4000	danmartinez@indio.org
City of La Quinta	Frank J.	Spevacek	78-495 Calle Tampico	La Quinta	CA	92253	City Manager	760 777 7030	fspevacek@la-quinta.org
City of La Quinta	Edie	Hylton	78-495 Calle Tampico	La Quinta	CA	92253	Interim Community Development Director	760 777 7032	ehylton@la-quinta.org
City of Palm Desert	John M.	Wohlmuth	73-510 Fred Waring Dr	Palm Desert	CA	92260	City Manager	760 346 0611	info@ci.palm-desert.ca.us
City of Palm Springs	David H.	Ready, Esq., Ph.D.	3200 E Tahquitz Canyon Way	Palm Springs	CA	92262	City Manager	760 322 8362	David.Ready@palmsprings-ca.gov
City of Rancho Mirage	Randal K.	Bynder	69-825 Highway 111	Rancho Mirage	CA	92270	City Manager	760 324 4511	CityManager@RanchoMirageCA.gov
Coachella Valley Association of Governments	Katie	Barrows	73-710 Fred Waring Drive	Palm Desert	CA	92260	Director of Environmental Services	760 346 1127	kbarrows@cvag.org
Coachella Valley Mountain Conservancy	Jim	Karpiak	73-710 Fred Waring Drive, Suite 112	Palm Desert	CA	92260	Executive Director	760 776 5026	jkarpiak@cvmc.ca.gov
Coachella Valley Water District	James	Barrett	P. O. Box 1058	Coachella	CA	92236	General Manager	760 398 2651	Jbarrett@cvwd.org
County of Riverside	Peter	Aldana	2720 Gateway Drive	Riverside	CA	92507	County Clerk	951 955 6200	acrdepartmenthead@asrclkrec.com
Department of Pesticide Regulations	Dave	Duncan	P.O. Box 4015	Sacramento	CA	995812-4015	Environmental Monitoring Branch Chief	916 445 3870	David.Duncan@cdpr.ca.gov
Desert Water Agency	David K.	Luker	1200 Gene Autry Trail	Palm Springs	CA	92264	General Manager	760 323 4971	sbaca@dwa.org
Imperial Irrigation District	Kevin	Kelley	P. O. Box 937	Imperial	CA	92251	General Manager		
Imperial Irrigation District - La Quinta Power Division			81-600 Avenue 58	La Quinta	CA	92253			
Indio Water Agency	Brian	Macy	83-101 Avenue 45	Indio	CA	92201	General Manager		iwa@indio.org
Mission Springs Water District	Arden	Wallum	66575 Second St	Desert Hot Springs	CA	92240	General Manager	760 329 6448	
Regional Water Control Board Region 7	Kai	Dunn	73-720 Fred Waring Dr, Suite 100	Palm Desert	CA	92260	Senior Water Resources Control Engineer	760 340 4521	jcarmona@waterboards.ca.gov
Regional Water Control Board Region 7	Jose	Figueroa-Acevedo	73-720 Fred Waring Dr, Suite 100	Palm Desert	CA	92260	Water Resources Control Engineer	760 776 8967	jfigueroa-acevedo@waterboards.ca.gov
Riverside County Agricultural Commissioner - Pesticide Use Regulatory Program	Bob	Mulherin	P. O. Box 1089	Riverside	CA	92502-1089	Deputy Agricultural Commissioner/Sealer	951 955 3045	rmulherin@co.riverside.ca.us
Riverside County Board of Supervisors	The Honorable Kevin	Jeffries	P. O. Box 1527	Riverside	CA	92502-1527	First District Supervisor	951 955 1010	district1@rcbos.org
Riverside County Board of Supervisors	The Honorable John	Tavaglione	P. O. Box 1646	Riverside	CA	92502-1646	Second District Supervisor	951 955 1020	district2@rcbos.org
Riverside County Board of Supervisors	The Honorable Chuck	Washington	P. O. Box 1486	Riverside	CA	92502	Third District Supervisor	951 955 1030	district3@rcbos.org
Riverside County Board of Supervisors	The Honorable John J.	Benoit	P. O. Box 1647	Riverside	CA	92502-1647	Fourth District Supervisor	760 863 8211	district4@rcbos.org
Riverside County Board of Supervisors	The Honorable Marion	Ashley	14375 Nason St, Suite 207	Moreno Valley	CA	92555	Fifth District Supervisor	951 486 5810	district5@rcbos.org
Riverside County Department of Environmental Health	Steve	Van Stockum	P.O. Box 7909	Riverside	CA	92513-7909	Director	951 955 8980	
Riverside County Fire Department Environmental Review			44-400 Town Center Way	Palm Desert	CA	92260			
Riverside County Flood Control & Water Conservation District/Regulatory	Dusty	Williams	1995 Market Street	Riverside	CA	92501	General Manager - Chief Engineer	951 955 1200	
Riverside County Planning Department			77588 El Duna Ct., Suite H	Palm Desert	CA	92211			
Riverside County Planning Department	Steve	Weiss	P.O. Box 1409	Riverside	CA	92502-1409	Planning Director		
South Coast Air Quality Management District	Barry	Wallerstein	21865 East Copley Drive	Diamond Bar	CA	91765-4182	Executive Officer	909 396 2000	
State of California Air Resources Board	Mary	Nichols	P.O. Box 2815	Sacramento	CA	95812	Chair		
State of California Water Resources Control Board	Ariana	Villanueva	Division of Water Quality, 15th Floor, 1001 "I" Street	Sacramento	CA	95814	Water Resources Control Engineer	916 341 5775	Ariana.Villanueva@Waterboards.ca.gov
State of California Water Resources Control Board	Phil	Isorena	Division of Water Quality, 15th Floor, 1001 "I" Street	Sacramento	CA	95814	Senior Water Resources Control Engineer,Chief, NPDES Unit	916 341 5544	philip.isorena@waterboards.ca.gov
Torres Martinez Desert Cahuilla Indians	Mary L.	Resvaloso	P. O. Box 1160	Thermal	CA	92274	Chairman	760 397 0300	mresvaloso@torresmartinez.org
Twenty-Nine Palms Band of Mission Indians	Darrell	Mike	46-200 Harrison Pl	Coachella	CA	92236	Chairman	760 863 2444	
US Army Corps of Engineers Los Angeles District			915 Wilshire Blvd., Suite 1101	Los Angeles	CA	90017		213 452 3425	publicaffairs.spl@usace.army.mil
US Fish & Wildlife Service - Palm Springs Office	Ken	Corey	777 E. Tahquitz Canyon Way, Suite 208	Palm Springs	CA	92262	Assistant Field Supervisor	760-322-2070	
Valley Sanitary District	Joseph A.	Glowitz	45-500 Van Buren St	Indio	CA	92201	General Manager	760 238 5400	info@valley-sanitary.org
Senator	Jeff	Stone	45-125 Smurr Street, Suite B	Indio	CA	92201		760 398 6442	
Assemblymember	Eduardo	Garcia	48220 Jackson St. #A3	Coachella	CA	92236		760 347 2360	
Assemblymember	Chad	Mayes	41608 Indian Trail Suite 1	Rancho Mirage	CA	92270		760 346 6342	



Coachella Valley Mosquito and Vector Control District
Pesticide Application Plan
2016

Pesticide Application Plan (PAP) Elements:

1. Description of all target areas, if different from the water body of the target area, in to which larvicides and adulticides are being planned to be applied or may be applied to control vectors. The description shall include adjacent areas, if different from the water body of the target areas;



The Coachella Valley extends for approximately 45 miles (72 km) in Riverside County southeast from the San Bernardino Mountains to the Salton Sea. It is approximately 15 miles (24 km) wide along most of its length, bounded on the west by the San Jacinto Mountains and the Santa Rosa Mountains and on the north and east by the Little San Bernardino Mountains. The Coachella Valley Mosquito and Vector Control District covers the entire valley and terminates at the Riverside/Imperial County line near the Salton Sea State Park. Larvicide and adulticide applications may occur anywhere in the specified region to bodies of water when deemed necessary by key mosquito and arbovirus surveillance indicators. The main waters of the U.S. that could be impacted by larvicide and adulticide applications are the Whitewater River/Storm Channel and the Salton Sea, as well as duck clubs which are flooded from October until February.

2. Discussion of the factors influencing the decision to select pesticide applications for vector control;

Deciding to use chemicals to control vectors relies on the analysis of surveillance data and a basic understanding of vectors and vector-borne disease ecology. District staff is routinely trained on the basic principles of the ecology of vectors and the pathogens they transmit. Several standard operating procedures have also been developed and/or adopted to give guidance in determining when pesticide use is warranted to control local mosquito populations in order to prevent arbovirus transmission.

Factors affecting the decision to use pesticides for Mosquito Control

Abiotic Factors. Abiotic factors that can influence a decision to use fast acting chemical control are seasonal and daily weather patterns and localized larval and adult habitat conditions. All of these can affect the potential for vector and arbovirus activity and ultimately affect a technician's decision to use a particular control product.

Biotic Factors. Biotic factors that can influence use of chemical control of mosquitoes include the number of larvae or pupae present in a breeding source, species and stage of mosquito larvae or adults present, presence and level of natural predators in a breeding habitat, level of resistance (if detected), and level of detected arbovirus activity in an area under surveillance for potential chemical control.

District Established Thresholds for Vector Control Measures

The District has established thresholds for both larval and adult mosquito control. These thresholds have been developed through years of surveillance and historical data of arbovirus transmission in mosquito producing habitats in the Coachella Valley.

The District has set standard larval sampling (dipping) protocols for various mosquito breeding habitats found throughout the Coachella Valley. Larval sampling consists of the vector control technician taking a certain number of dips, based on the surface area and the type of the breeding source, using the standard 1-pint dipper. Once all dips are taken, the vector control technician determines the average number of mosquito larvae per dip. If the average per dip exceeds one larva per dip, this level of breeding warrants control activity. All the larval samples obtained by dipping surveillance are labeled and taken to the laboratory for final identification. At this point, abiotic and biotic factors are taken under consideration, and the proper treatment is determined by the vector control technician in the field. When at all possible, physical (i.e. stagnant water removal) or biological control (i.e. mosquitofish) measures are used. In habitats that are conducive to breeding primary vectors of human health importance, it is necessary for District technicians to use one of the few fast acting, biorational, and highly specific control products that are registered in California.

For adulticiding, the District established adulticiding protocols and five-year thresholds using data from adult mosquito carbon dioxide baited traps deployed throughout the Coachella Valley. These traps and thresholds are used as indicators for when it may be necessary to use adult control measures. When trap numbers of mosquitoes of public health importance *(Culex tarsalis, Culex quinquefasciatus*) exceed the five-year threshold for that trap, District staff begins to coordinate the potential use of adulticides to reduce the local adult mosquito population to prevent or reduce arbovirus transmission. In addition, factors such as presence or absence of arbovirus activity, risk assessment level (see discussion below), seasonal weather patterns, and localized resistance are considered carefully when determining if adulticiding measures are justified and will be effective. In every case the pesticide labeling requirements are strictly adhered to.

CVMVCD Mosquito-Borne Virus Surveillance and Emergency Response Plan (see attachment)

The District has developed and adopted a modified version of the California Mosquito-borne Virus Surveillance and Response Plan. This document outlines the District's mosquito surveillance and control objectives and outlines several models used to predict the risk of mosquito-borne disease epidemics and establishes standard public outreach, surveillance, and mosquito control measures based on the level of estimated risk. Please refer to Section V thru VI for a description of response levels, models used to determine level of risk for human epidemics of SLE, WEE, and WNv, and as well as descriptions of the recommended District response based on the level of risk.

3. Pesticide products or types expected to be used and if known, their degradation by-products, the method in which they are applied, and if applicable, the adjuvants and surfactants used;
The following list of active ingredients may be used by the District for larval or adult control. This list is directly from the NPDES Permit for Biological and Residual Pesticide Discharges to Waters of the U.S. for Vector Control Applications. All of these products are used according to label directions and may be applied by ground (hand, truck, ATV, backpack, etc) or by air (helicopter or fixed wing aircraft).

List of Permitted Larvicide Products

Larvicide Active Ingredient
Bacillus thuringiensis israelensis (Bti)
Bacillus (*Lysinibacillus*) *sphaericus*
(S) – Methoprene
Monomolecular Films
Petroleum Distillates
Spinosad
Temephos
Any minimum risk category pesticides that are FIFRA exempt and registered for use in California and used in a manner specified in 40 C.F. R. section 152.25.

List of Permitted Adulticide Products

Adulticide Active Ingredient
Deltamethrin
Etofenprox
Lambda-cyhalothrin
Malathion
Naled
N-octyl bicycloheptene dicarboximide

Adulticide Active Ingredient
(MGK-264)
Piperonyl butoxide (PBO)
Permethrin
Prallethrin
Pyrethrin
Resmethrin
Sumithrin
Any minimum risk category pesticides that are FIFRA exempt and registered for use in California and used in a manner specified in 40 C.F. R. section 152.25.

4. Description of ALL the application areas and the target areas in the system that are being planned to be applied or may be applied. Provide a map showing these areas;
Any site that holds water for more than 96 hours (4 days) can produce mosquitoes. Source reduction is the District's preferred solution, and whenever possible the District works with state, county, city, and private property owners to effect long-term solutions to reduce or eliminate the need for continued applications as described in CVMVCD Mosquito Reduction Best Management Practices.

The typical sources treated by the District which can be classified as waters of the U.S. include:

Freshwater swamps and marshes. In the Coachella Valley, marshes (primarily duck clubs or managed wetlands) are drained and re-filled once to enhance the primary productivity of the habitat, and under certain circumstances, this can result in large populations of mosquitoes.

Whitewater River/Storm Channel. The Whitewater River transects the entire length of the Coachella Valley. Most of the year, the river is dry and only has significant flow during the few rain storms experienced during the winter months. Water flow does occur year round from the city of Indio east to the Salton Sea, due to the treated sewage water discharge and agricultural run off. This part of the Whitewater River runs year-round and does not breed mosquitoes. Very few treatments to the Storm Channel occur in the urban, dry sections, where water discharge from local home owner associations creates stagnant pools that are prone to dense growths of bulrush and cattail.

Salt marshes. In the Coachella Valley, the salt marshes along the Salton Sea can produce large numbers of *Cx. tarsalis* mosquitoes, negatively influencing the health, comfort and economy of residents and visitors in the area. Natural decrease of the Salton Sea level greatly reduced the *Cx. tarsalis* population in the area, but *Cx. tarsalis* can still rise to significant numbers during the spring and fall posing a serious public health threat.

Temporary standing water. There are several species of mosquitoes that can breed in water that stands only one to two weeks. Such habitats include irrigation tail water as well as standing water in irrigated pastures and other agricultural habitats. Few mosquito species from three major genera are found in

these sources, and during warm months and increased irrigation, pastures and other agricultural lands are enormous mosquito producers of *Aedes*, *Psorophora*, and *Culex* mosquitoes.

Wastewater treatment facilities/Storm Water Retention Basins. Aquatic sites in this category include a wide variety of ponds, ditches and other structures designed to handle wastewater of some kind. Included are sewage treatment ponds, wetlands managed for de-nitrification, and storm sewers systems.

5. Other control methods used (alternatives) and their limitations;
With any mosquito or other vector source, the District's first goal is to look for ways to eliminate the source, or, if that is not possible, for ways to reduce the vector potential. The most commonly used methods and their limitations are included in the CVMVCD Mosquito Reduction Best Management Practices.

Specific methods used by the District include: physical control, biological control, public education, and working with both government and private property owners to find long-term water management strategies that meet their needs while minimizing the need for public health pesticide applications.

Mosquitofish, *Gambusia affinis,* are the most commonly used biological control agent for mosquitoes in the world. Correct use of this fish can provide safe, effective, and persistent suppression of a variety of mosquito species in many types of mosquito sources.

As with all safe and effective control agents, the use of mosquitofish requires a good knowledge of operational techniques and ecological implications, careful evaluation of stocking sites, use of appropriate stocking methods, and regular monitoring of stocked fish. The District uses mosquitofish in accordance with California Fish and Wildlife regulations on private property to control mosquitoes.

The principal habitat characteristic that affects the successful use of mosquitofish is its relative stability. Mosquitofish usually are not effective in intermittently flooded areas unless a refuge impoundment is provided. Because of this, mosquitofish are more effective against mosquito breeding in permanent and semi-permanent water, such as *Culex* spp., *Anopheles* spp., and *Culiseta* spp., than against floodwater species, like *Aedes* spp. and *Psorophora* spp.

6. How much product is needed and how this amount was determined;
The need to apply product is determined by surveillance. Actual use varies annually depending on mosquito abundance. The pesticide amounts presented below were applied to waters of the U.S. within the District boundaries in 2015. These amounts will change from year to year due to annual variability in required pesticide applications for mosquito control. This data is provided as an example of the active ingredients and the amounts used in one year. Other public health pesticides in addition to those listed below may be used as part of the agency's best management practices.

Active Ingredient	Estimated Annual Usage Calendar Year	Unit of Measure
Larvacides		
(S)-Methoprene Liquid	2.79	Gallons
(S)-Methoprene Pellets	350	Pounds

(S)-Methoprene Wettable Soluble Powder	24	Units
(S)-Methoprene Briquettes	15	Units
(S)-Methoprene Granules	8553.57	Pounds
B. sphaericus Wettable Solube Powder	49	Units
B. sphaericus Granules	3538.34	Pounds
Bti Granules	6407.70	Pounds
Bti Liquid	11.94	Gallons
Bti Wettable Dissolvable Granules	0.01	Pounds
Monomolecular Films	0.41	Gallons
Mineral Oil	0.61	Gallons
Spinosad Liquid	1.55	Gallons
Spinosad Granules	5057.51	Pounds
Spinosad Tablets	8	Units
Adulticides		
Lambda-cyhalothrin	1.41	Gallons
Sumithrin	11.89	Gallons

7. Representative monitoring locations and the justification for selecting these locations;
Please see the MVCAC NPDES Coalition Monitoring Plan

8. Evaluation of available BMPs to determine if there are feasible alternatives to the selected pesticide application project that could reduce potential water quality impacts; and

Please refer to CVMVCD Mosquito Reduction Best Management Practices. Evaluation and determination of the feasibility of alternatives to pesticide application are discussed in greater detail in Section 11 below.

9. Description of the BMPs to be implemented. The BMPs shall include, at minimum:

a. Measures to prevent pesticide spills;

- District staff monitors application equipment on a daily basis to ensure it remains in proper working order.
- Spill mitigation kits are placed in all District vehicles and pesticide storage areas to respond to spills.
- Pesticides are kept in secure locations both on District grounds and when in District vehicles.
- Employees are trained on spill prevention and response annually.

b. Measures to ensure that only a minimum and consistent amount is used;

- Spray equipment is calibrated annually and is a part of the Cooperative Agreement with California Department of Public Health.
- District recommended rates (within the range of specified label rates) for all vector control products have been determined through years of applied studies to ensure the

proper rates are utilized in each of the mosquito breeding habitats found in the Coachella Valley.

- Each Vector Control Technician uses scales and graduated cylinders to measure control products on a daily basis.
- Products are checked out to certified Vector Control Technicians on a daily basis to help ensure accuracy of reporting and limit amount of product used on a daily basis.

c. **A plan to educate Coalition's or Discharger's staff and pesticide applicator on any potential adverse effects to waters of the U.S. from the pesticide application;**
   - District applicators (State Certified Public Health Vector Control Technicians) are all certified by the California Public Health Department. They are also required to complete in-house pesticide training on a yearly basis and attend, within two year cycles, state training to maintain their state certification.

d. **Descriptions of specific BMPs for each spray mode, e.g. aerial spray, truck spray, hand spray, etc.;**
   - The District calibrates all equipment mounted on trucks and hand held larviciding equipment each year to meet application specifications.
   - Field Supervisors review pesticide application records daily to ensure appropriate amounts of material are being used.
   - Ultra Low Volume (ULV) equipment is calibrated annually for output and droplet size to meet label requirements.
   - Aerial larvaciding equipment is calibrated by the Contractor for each product.
   - Aerial adulticiding equipment is calibrated before each use and droplet size is monitored by the District to ensure droplets meet label requirements. Airplanes used in urban ULV applications and the primary helicopter used for rural ULV spraying is equipped with advanced guidance and drift management equipment, to ensure the best available technology is being used to place product in the intended spray area. If a secondary airplane is used in rural ULV applications, it will be equipped with an advanced guidance system.

e. **Descriptions of specific BMPs for each pesticide product used; and**
   - The District has determined recommended rates for various products based on years of applied studies in the Coachella Valley. *Please see Exhibit A: District Product Recommended Rates.*

f. **Descriptions of specific BMPs for each type of environmental setting (agricultural, urban, and wetlands)**
   - Please see CVMVCD Mosquito Reduction Best Management Practices.

10. Identification of the Problem; prior to first pesticide application, covered under this General Permit, that will result in a discharge of biological and residual pesticides to waters of the US, and at least once each calendar year thereafter, prior to the first pesticide application for that calendar year, the Discharger must do the following for each vector management area:

a. **If applicable, establish densities for larval and adult vector populations to serve as action threshold(s) for implementing pest management strategies**

Only those mosquito sources that District staff determines to represent imminent threats to public health or quality of life are treated. The presence of any mosquito may necessitate treatment, however higher

thresholds may be applied depending on the District's resources, disease activity, or local needs. Treatment thresholds are based on a combination of one or more of the following criteria:

- Mosquito species present
- Mosquito stage of development
- Pest, nuisance, or disease potential
- Disease activity
- Mosquito abundance
- Flight range
- Proximity to populated areas
- Size of source
- Presence/absence of natural enemies or predators
- Presence of sensitive/endangered species or habitats.

b. Identify target vector species to develop species-specific pest management strategies based on developmental and behavioral considerations for each species;

Please see the CVMVCD Mosquito Reduction Best Management Practices and the CVMVCD Mosquito-borne Virus Surveillance and Response Plan.

c. Identify known breeding areas for source reduction, larval control program, and habitat management; and

Any site that holds water for more than 96 hours (four days) can produce mosquitoes. Source reduction is the District's preferred solution, and, whenever possible, the District works with property owners to implement long-term solutions to reduce or eliminate the need for continued applications as described in CVMVCD Mosquito Reduction Best Management Practices.

d. Analyze existing surveillance data to identify new or unidentified sources of vector problems as well as areas that have recurring vector problems.

The District continually collects adult and larval mosquito surveillance data and disease surveillance data by testing certain number of mosquito samples and sentinel chicken test results and uses them to guide mosquito control activities. The District is also implementing new GIS software that allows for mapping and modeling vector related issues, which help track mosquito breeding sources under control efforts and frequency and amounts of control products usage.

11. Examination of Alternatives; Dischargers shall continue to examine alternatives to pesticide use and reduce the need for applying larvacides that contain temephos and for spraying adulticides. Such methods include:

a. Evaluating the following management options, in which the impact to water quality, impact to non-target organisms, vector resistance, feasibility, and cost effectiveness, should be considered:

- **No action**
- **Source prevention**
- **Mechanical or physical source reduction methods**
- **Cultural methods**
- **Biological control agents**

- **Pesticides**

  If there are no alternatives to pesticides, dischargers shall use the least amount of pesticide necessary to effectively control the target pest.

b. Applying pesticides only when vectors are present at a level that will constitute a nuisance.

The District staff uses the principles and practices of Integrated Vector Management (IVM) as described in CVMVCD Mosquito Reduction Best Management Practices. As stated in item #10 above, locations where vectors may exist are assessed, and the potential for using alternatives to pesticides is determined on a case-by-case basis. Commonly considered alternatives include: 1) Eliminate artificial sources of standing water; 2) Ensure temporary sources of surface water drain within four days (96 hours) to prevent adult mosquitoes from developing; 3) Control plant growth in ponds, ditches, and shallow wetlands; 4) Design facilities and water conveyance and/or holding structures to minimize the potential for producing mosquitoes; and 5) Use appropriate biological control methods that are available.

Implementing preferred alternatives depends on a variety of factors including availability of agency resources, cooperation with stakeholders, coordination with other regulatory agencies, and the anticipated efficacy of the alternative. If a pesticide-free alternative does not sufficiently reduce the risk to public health, pesticides are considered, beginning with the least amount necessary to effectively control the target vector.

12. Correct Use of Pesticides. Coalition's or Discharger's use of pesticides must ensure that all reasonable precautions are taken to minimize the impacts caused by pesticide applications. Reasonable precautions include using the right spraying techniques and equipment, taking account of weather conditions and the need to protect the environment.
This is an existing practice of the District, and is required to comply with the Department of Pesticide Regulation's (DPR) requirements and the terms of our California Department of Public Health (CDPH) Cooperative Agreement. All pesticide applicators receive annual safety and spill training in addition to their regular continuing education.

13. Specify a website where public notices, required in Section VIII.B, may be found.
http://www.cvmvcd.org

References:

CVMVCD Mosquito Reduction Best Management Practices (Exhibit B attached); Copies may be also requested by calling the Coachella Valley Mosquito and Vector Control District at (760) 342-8287

CVMVCD Mosquito-borne Virus Surveillance and Response Plan. 2015 (Exhibit C attached); Copies may be also requested by calling the Coachella Valley Mosquito and Vector Control District at (760) 342-8287

MVCAC NPDES Coalition Monitoring Plan.
Copies may requested by calling MVCAC at (916) 440-0826

Exhibit A

District Product Recommended Rates

Larvicides – not effective on pupae					
Product	**CVMVCD Recommended Rate**	**Active Ingredient**	**Mode of Action**	**Residual**	**FYI**
Altosid Briquet	**1 briquet /100sq. feet** Apply in non-flowing or low-flowing water up to 2 feet deep. Use 1 additional briquet per 2 ft of water depth deeper than 2 feet	8.62% S-Methoprene	Does not have to be ingested. Insect growth regulator	21 to 30 days	Requires treatment of whole body of water. It's ok to see all instars and pupae when using this product. Re-treat after 30 days
Altosid XR Briquets	**1 briquet /100sq. feet** Apply in non-flowing or low-flowing water up to 2 feet deep. Use 1 additional briquet per 2 ft of water depth deeper than 2 feet	2.1 % S-Methoprene	Does not have to be ingested Insect growth regulator	District: 75 days; Label: 150 days	It's ok to see all instars and pupae when using this product. Re-treat after 150 days
Altosid Liquid	**3-4oz / acre.** **District Mandated Minimum Rate** **0.03 oz/330 sq ft or less** Applications should be made within 3-5 days of pupation (2^{nd}, 3^{rd}, 4^{th} larval instars)	5% S-Methoprene	Does not have to be ingested Insect growth regulator	7 to 10 days	It's ok to see all instars and pupae when using this product. Re-treat after 7 days
Altosid Pellets	**7.5 to 10 lbs / acre** Label Rate: **2.5 - 10 lbs**	4.25% S-Methoprene	Does not have to be ingested Insect growth regulator	30 days	It's ok to see all instars and pupae when using this product. Re-treat after 30 days
Altosid Pellets WSP	**1 pouch for up to 135 sq. ft.**	4.25 % S-Methoprene	Does not have to be ingested Insect growth regulator	30 days	It's ok to see all instars and pupae when using this product. Re-treat after 30 days
Altosid XR-G	**10 lbs./acre –*Aedes* sp.; 15 -20 lbs./ac – *Culex* sp.** **Label Rate: 5-20 lbs./acre**	1.5% S-Methoprene	Does not have to be ingested. Insect growth regulator	21 days	It's ok to see all instars and pupae when using this product. Re-treat after 21 days.
MetaLarv S-PT	**7 lbs. / acre.** Label Rate: **2.5-10 lbs/ac** Use a higher rate when water is deep, has dense vegetation or is polluted, high water flows or mosquito population is high	4.2% S-Methoprene	Does not have to be ingested Insect growth regulator	Up to 42 days	It's ok to see all instars and pupae when using this product. Apply up to 28 days pre-flood. Can be applied to areas containing fish or contact with humans or animals.
Natular 2EC OMRI listed	**2.5 oz/acre** Use a higher rate when water is polluted and mosquito population is high. **Label Rate: 1.1 to 2.8 oz/acre, up to 6.4 oz/ac**	20.6% Spinosad mixture of spinosyn A & D	Neuro-toxins (interfere with nerve & muscle function)	7 days; up to 14 days	Re-apply after 7 days if needed (late instars present)
Natular G **OMRI listed**	**6 - 9 lbs/acre** **Label Rate:3.5 - 9 lbs, up to 20 lbs** Use a higher rate if water has dense vegetation, polluted and mosquito population is high	0.5% Spinosad mixture of spinosyn A & D	Neuro-toxins (interfere with nerve & muscle function)	7 days	Re-apply after 7 days if needed (late instars present)
Natular G30 **OMRI listed**	**7 to 10 lbs/acre** **Label Rate: 5 to 20 lbs/acre** Use a higher rate if water has dense vegetation, polluted and mosquito population is high	2.5% Spinosad mixture of spinosyn A & D	Neuro-toxins(interfere with nerve & muscle function)	30 days	More frequent applications may be made if monitoring indicates that larval populations have reestablished by seeing late instars
Natular T30 **OMRI listed**	**1 tablet up to 100 sq/ft** **(less than 2 feet depth)**	5% Spinosad mixture of spinosyn A & D	Neuro-toxins (interfere with nerve & muscle function)	30 days	Water flow may increase the dissolution of the tablet. Evaluate applications for loss of effectiveness by noting presence of late instars.
Natular XRT OMRI listed	**1 tablet up to 100 sq/ft** **(less than 2 feet depth)**	6.25% Spinosad mixture of spinosyn A & D	Neuro-toxins (interfere with nerve & muscle function)	District: 90 days Label: 180 days	Water flow may increase the dissolution of the tablet. Evaluate applications for loss of effectiveness by noting presence of late instars

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Larvicides – not effective on pupae					
Product	**CVMVCD Recommended Rate**	**Active Ingredient**	**Mode of Action**	**Residual**	**FYI**
AquaBac 200G	**10 lbs. to 20 lbs. / acre** **Label Rate: 2.5 to 20 lbs/ac** Use a higher rate when water has dense vegetation or is polluted and mosquito population is high (especially 3rd and early 4th)	200 toxic units *Bacillus thuringiensis israelensis*	Stomach poison. Stops feeding, causes breakdown of midgut resulting in death.	48 to 72 hrs (Quick kill)	Not recommended in water below 55° F. Water temp below 68°F larvae reduce their feeding
Vectobac 12AS	**16 to 32 oz/ac** **Label Rate: 4oz. – 32oz. / acre** **District Mandated Minimum Rate** **0.33 oz/450 sq ft or less** Use a higher rate when water has dense vegetation or is polluted and mosquito population is high especially 3rd and early 4th	1200 toxic units *Bacillus thuringiensis israelensis*	Stomach poison. Stops feeding, causes breakdown of midgut resulting in death.	24 hrs (Quick kill)	7-14 days interval between applications. Not recommended in water below 55° F. Water temp below 68°F larvae reduce their feeding
Vectobac G	**10 lbs- 20 lbs / acre** **Label Rate:2.5 - 20 lbs** Use higher rate when water has dense vegetation or polluted & mosquito population is high especially 3rd ,early 4th)	200 toxic units *Bacillus thuringiensis israelensis*	Stomach poison. Stops feeding, causes breakdown of midgut resulting in death.	24 hrs (Quick kill)	7-14 days interval between applications. Not recommended in water below 55° F. Water temp below 68°F larvae reduce their feeding
Vectobac WDG OMRI listed	**1.75-7.0 oz/acre** Use a higher rate when water is polluted 7.0-14 oz/acre (especially3rd and early 4th)	3000 toxic units *Bacillus thuringiensis israelensis*	Stomach poison. Stops feeding, causes breakdown of midgut resulting in death.	24 hrs (Quick kill)	Not recommended in water below 55° F. Water temp below 68°F larvae reduce their feeding
Spheratax SPH 50G WSP	**1 pouch up to 50 sq. ft.**	5.0% *Bacillus sphaericus*, (Bs)	Produces extra-cellular crystalline toxins that destroys the gut lining of larvae when ingested (starvation)	7 to 10 days	Can be used in areas that contain fish and areas by or in contact with humans and pets. Bs bacteria will multiply in larval cadavers. Best choice when high larval counts.
Vectolex WDG	**1 - 1.5 lbs/ac.** Use higher rates where extended residual control is required or in deep water or dense surface cover	51.2% *Bacillus sphaericus*, (Bs)	Produces extra-cellular crystalline toxins that destroys the gut lining of larvae when ingested (starvation)	7 to 10 days	Bs bacteria will multiply in larval cadavers. Best choice when high larval counts. 1- 4 weeks interval between applications.
Vectolex WSP	**1 pouch up to 50 sq. ft.**	7.5% *Bacillus sphaericus*, (Bs)	Produces extra-cellular crystalline toxins that destroys the gut lining of larvae when ingested (starvation)	7 to 10 days	Can be used in areas by or in contact with humans and animals, including fish. Bs bacteria will multiply in larval cadavers. Best choice when high larval counts.
VectoMax FG	**10 lbs. to 20 lbs. / acre** **Label Rate: 5 to 20 lbs/ac** Use a higher rate when water has dense vegetation or is polluted and mosquito population is high	*Bacillus thuringiensis israelensis* & *Bacillus sphaericus*	Produces extra-cellular crystalline toxins combination that destroys the gut lining of larvae when ingested (starvation)	7 to 10 days	Use in sources where vegetation is present. Per label it can be used where fish are present. For Organic Production.
VectoMax WSP	**1 pouch/50 sq. ft.**	*Bacillus thuringiensis israelensis* & *Bacillus sphaericus*	Produces extra-cellular crystalline toxins combination that destroys the gut lining of larvae when ingested (starvation)	7 to 10 days	Treatment based on surface area. Safe to use in areas by or in contact with humans and animals. For Organic Production

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VectoPrime FG	**Label rate: 1.25 – 20 lbs/ac** Use higher rate in pre-flood applications or when water has dense vegetation or is polluted and mosquito populations is high	6.07% *Bacillus thuringiensis israelensis* and 0.10% S-Methoprene	Bti destroys gut lining and methoprene inhibits maturation.		Use when all stages of larvae are present.
District Approved Mixtures					
Product	**CVMVCD Recommended Rate**	**Active Ingredient**	**Mode of Action**	**Residual**	**FYI**
Vectomix: 4:1 **Vectolex CG and Vectobac G**	**15 to 20 lbs/ac** (Use the higher rates in high organic or polluted waters.)	*Bacillus thuringiensis israelensis* & *Bacillus sphaericus*	Produces extra-cellular crystalline toxins combination that destroys the gut lining of larvae when ingested	7 to 10 days	Use in sources where vegetation is present.
Duplex **Bti 12AS/Altosid 6:1 or 12:1 ratio**	**16 to 32 oz/acre (mixed product)** Use higher rates where extended residual control is required or in deep water or dense surface cover	S-Methoprene & *Bacillus thuringiensis israelensis*	Bti destroys gut lining and methoprene inhibits maturation.	5 to 10 days	Use when all stages of larvae are present.
Pupacides					
Product	**CVMVCD Recommended Rate**	**Active Ingredient**	**Mode of Action**	**Residual**	**FYI**
Agnique MMF	**0.5 gal to 1 gal. per acre** **District Mandated Minimum Rate** **0.33 oz/113 sq. ft or less**	100% Long chain Multi-branched alcohol	Forms a thin surfactant layer on water surface. Larvae/pupae can't attach to surface & die from exhaustion.	5 to 22 days	Slow acting, longer residual. Use the fan spray method when applying this product.
Coco Bear Larvicide Oil	**3 gallon per acre, (9 fl. oz./1000 sq. ft.)** **Label Rate: 3-5 gallons/ acre, (9-15 fl. oz./ac.).** Use higher rates with heavier, denser vegetation and/or substantially polluted water.	10% Mineral Oil	Kills by suffocation. Mosquitoes will not develop resistance	5 to 7 days	Do not apply with wind speeds greater than 15 mph. Apply as a medium or course spray with partial cone spray pattern.
Kontrol Larvicide Oil	**3 gallon per acre, (9 fl. oz./1000 sq. ft.)** **Label Rate: 1-5 gallons/ acre, (3-15 fl. oz./ac.).** Use higher rates with heavier, denser vegetation and/or substantially polluted water.	98% Mineral Oil	Kills by suffocation. Mosquitoes will not develop resistance	5 to 7 days	Do not apply with wind speeds greater than 15 mph. Apply as a medium or course spray with partial cone spray pattern.
Imported Fire Ant Products					
Product	**CVMVCD Recommended Rate**	**Active Ingredient**	**Mode of Action**	**Residual**	**FYI**
Advion Fire Ant Bait	**1.5 lbs. / acre broadcast or .5 oz./mound uniformly distributed 3-4 feet around the mound.**	0.045% Indoxacarb	Blocking of nerve sodium channel	N/A	6 lbs./ac total or 4 applications in a one year period. Retreat after 12-16 weeks if needed. May retreat after 7 days if rain or irrigation within 2-3 hours post-treatment.
Extinguish Plus	**1.5 lbs. / acre broadcast or .5 oz./mound uniformly distributed 3-4 feet around the mound.**	0.365% Hydromethylnon & 0.25% S-Methoprene	Metabolic inhibitor affecting the mitochondrial membrane halting oxidative phosphorylation	N/A	Do not exceed 8 lbs./ac./yr. or 4 applications. Do not apply within 6 hours of a rain event.
Siesta Fire Ant Bait	**1.5 lbs./acre broadcast** **Label Rate: 1 – 1.5 lbs./acre or 1 – 2 oz./mound uniformly distributed 3-4 feet around the mound**	0.063% Metaflumizone	Blocking of nerve sodium channel	N/A	6 lbs./ac total or 4 applications in a one year period. Retreat after 12-16 weeks if needed. May retreat if rainfall within 12 hours of application.

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MOSQUITO ADULTICIDE PRODUCT USE GUIDELINES

Product	Product Application Rate, (Label)	Active Ingredient	Mode of Action	CVMVCD Recommended Habitat Use	Persistence
Anvil 10+10 ULV	0.21-0.62 fl. oz. Anvil 10+10 ULV per acre. May be diluted with suitable solvent (e.g., mineral oil) to proper application rate.	Sumithrin 10%, Piperonyl Butoxide 10%	Axonic nerve toxin	0.62 fl. oz. Anvil 10+10 ULV per acre. If dilution is required, dilute with oil to achieve proper application rate. Do not treat a site with more than 0.0036 lbs. of Sumithrin in a 24-hour period. Approved for application over agricultural areas. Observe all District adulticiding protocols.	Photolabile (breaks down in sunlight).
Aqua-Reslin	0.007 pounds permethrin/acre for ULV applications. For barrier treatments do not exceed 0.1 lbs. AI/acre.	Permethrin (microencapsulated), 20%, Piperonyl Butoxide, 20%	Axonic nerve toxin	0.007 ponds permethrin/acre for ULV applications. For barrier treatments do not exceed 0.1 lbs AI/acre. Dilute with water only. Observe all District adulticiding protocols.	Not specified on label.
BVA 13 Oil	Use as diluent in resmethrin, pyrethrum or pyrethroid based mosquito adulticide where dilution of product is required.	Refined Petroleum Distillate, 100%	Dilutent	Use as necessary to dilute oil-based adulticide products to achieve proper application rates. Use only with aerial applications. Approved for a wide variety of crops.	Dilutent only.
Demand CS	Structural or vegetation barrier treatment applied at 0.2-0.8 fl. oz. Demand CS/1000 sq. ft. of treated surface area	Lambda-cyhalothrin, microencapsulated pyrethroid, 9.7%	Axonic nerve toxin	Structural or vegetation barrier treatment applied to the surface at 0.6 fl. oz. of Demand CS/1000 sq. ft. of treated surface area to contact adult mosquitoes upon landing and resting on the treated surface.	Apply at 7 day intervals for residual control.
DeltaGard	No more than 0.00134 lbs. of a.i./acre/72 hrs. If applying 3 days in a row, use 0.00044 lbs of a.i./acre. Can be applied to crops. No more than 30 applications at 0.00045 of a.i./acre/year. No more than 0.036 lbs of a.i. per site per year	Deltamethrin, 2%	Axonic nerve toxin		Not specified on label
Pyrocide 7396	0.0025 lbs. of pyrethrin per acre for ground or aerial ULV application. May be diluted with BVA 13 oil to proper application rate.	Pyrethrins 5.0%, Piperonyl Butoxide 25%	Axonic nerve toxin	0.0025 lbs. of pyrethrin per acre for ground or aerial fogging application. May be diluted with BVA 13 oil (2:1 ratio of oil to pyrocide) for proper application rate. Contains 0.367 lbs. pyrethrins/gallon. Observe all District adulticiding protocols.	Contact insecticide, no residual.

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Scourge 4+12	Do not exceed 25 applications at 0.007 lbs a.i./acre/year. No site should receive more than 0.18 pounds of resmethrin in a year.	Resmethrin, 4.14%. Piperonyl Butoxide, 12.42%	Axonic nerve toxin	No more than 0.007 pounds resmethrin/acre for ULV applications. Helicopter application must be at least at 75 ft. altitude.	Not specified on label
Scourge 18+54	Do not exceed 25 applications at 0.007 lbs a.i./acre/year. No site should receive more than 0.18 pounds of resmethrin in a year.	Resmethrin, 18%. Piperonyl Butoxide, 54%	Axonic nerve toxin	No more than 0.007 pounds resmethrin/acre for ULV applications. Helicopter application must be at least at 75 ft. altitude.	Not specified on label
Zenivex E20	Do not exceed 25 applications per year. No site should receive more than 0.18 pounds of etofenprox in a year. No site should receive more than 0.028 lbs. of a.i. in a month. Applications to crops are limited to 4 per month with no more than 2 in a 7-day period.	Etofenprox, 20%	Axonic nerve toxin	No more than 0.007 pounds resmethrin/acre for ULV applications. Helicopter application must be at least at 100 ft. altitude. Can be applied to crops.	Not specified on label
DeltaDust	Amount to be applied will vary with site but should usually be in the range of 2-3 grams per square yard or .5 lbs. per 1000 square feet.	Deltamethrin .05%	Axonic nerve toxin	Single use dust to remove nuisance bees by thoroughly dusting nest, entrance and surrounding areas where insects alight.	Residual up to 8 months. Waterproof

COACHELLA VALLEY MOSQUITO AND VECTOR CONTROL DISTRICT

MOSQUITO-BORNE VIRUS SURVEILLANCE AND EMERGENCY RESPONSE PLAN

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E-mail: cvmosquito@cvmvcd.org
www.cvmvcd.org

GSW 3.28.2015

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I. INTRODUCTION

For over 46 years, California has had a mosquito-borne disease surveillance program in place to monitor mosquito abundance and encephalitis virus activity. The state wide surveillance program was established in 1969. The District started with surveillance in the early 1980s. The present program was established in 1990 through a cooperative effort of the Arbovirus Research Group at the School of Public Health, UC Berkeley (now the Center for Vector-borne Disease, UC Davis), and the Coachella Valley Mosquito and Vector Control District (the District).

The District mission is to enhance the quality of life for our community by providing effective and environmentally sound vector control and disease prevention. This mission is accomplished through an ongoing mosquito surveillance and control program. Intensive control measures may be applied to reduce the potential for virus transmission to humans by suppressing infected mosquito populations for no less than a 10 day period while infectious viremia persists in vertebrate hosts, thus breaking the cycle by preventing new vector infections.

This document describes an enhanced surveillance and response program for the Coachella Valley dependent on the level of risk of mosquito-borne virus transmission to humans. The Mosquito-borne Virus Surveillance & Response Plan generated by California Department of Health Services, Mosquito & Vector Control Association of California and University of California, is the core of this document, however some necessary adjustments were made in benchmark ratings relative to the conditions in the Coachella Valley.

Guidelines for adult mosquito surveillance, processing mosquitoes for arbovirus detection, maintaining and testing sentinel chickens, dead birds and equines, as well as information regarding compounds approved for mosquito control in California are part of the California State Mosquito-Borne Virus Surveillance & Response plan.

II. BACKGROUND INFORMATION

Mosquito-borne viruses belong to a group of arthropod-borne viruses referred to us as arboviruses (for **ar**thropod-**bo**rne). From 12 mosquito-borne viruses known to occur in California, to date, only St. Louis encephalitis virus (SLE), western equine encephalomyelitis virus (WEE), and West Nile virus (WNV) have caused significant outbreaks of human disease. These viruses are maintained in nature in wild bird-mosquito cycles, and therefore they do not depend upon infections of humans or domestic animals for their persistence.

Surveillance includes the monitoring of immature and adult mosquito abundance and detecting virus activity by testing (a) adult female mosquitoes, (b) sentinel chickens and wild birds, (c) horses, and (d) humans for infection. Surveillance must include not only the monitoring of mosquito-borne viruses known to exist in California, but also the detection of newly introduced viruses.

III. MOSQUITO SURVEILLANCE OBJECTIVES

Mosquito control is the only practical method of protecting people and animals from WNV, SLE and WEE infections. Larvae and pupae (immature stages) of *Culex tarsalis* and *Culex quinquefasciatus* can be found throughout the Coachella Valley in a wide variety of aquatic sources, ranging from urban retention basins to irrigated agricultural lands, Salton Sea marshes and duck club habitats.

A. Mosquito Surveillance

Surveillance includes monitoring of immature and adult mosquito abundance in the Coachella Valley throughout the year. To monitor mosquito larvae, "dippers" or long-handled ladles are used to collect samples from known and new water sources. At that time, the number of larvae and pupae per "dip" is estimated. These data are used to determine larval control measures. The records of the number and developmental stages of larvae, source size treated, product name and amount used, with the control effectiveness data can provide an early warning tool for forecasting the size of the adult population.

Mosquito adult surveillance in the Coachella Valley is conducted by setting 47 gravid and CO_2 baited traps on a weekly basis, and setting an additional 55 CO_2 traps on a bi-weekly basis. Adult mosquito abundance is a key factor when evaluating the risk of disease transmission. **Guidelines for mosquito surveillance are summarized in Appendix A of California State Mosquito-Borne Virus Surveillance & Response plan – April 2015.**

B. Mosquito Infections

Early detection of virus activity may be accomplished by testing *Culex tarsalis and Culex quinquefasciatus,* the primary vectors of SLE, WEE, and WNV in the Coachella Valley for virus infection. Sampling of other mosquito species may be necessary to detect the introduction of viruses that do not have a primary avian-*Culex* transmission. Mosquitoes are trapped by using carbon-dioxide-baited traps and using gravid traps baited with water with enriched organic content and the females are then pooled in groups up to 50 for testing at the District. **Procedures for processing mosquitoes for virus infection are summarized in Appendix B California State Mosquito-Borne Virus Surveillance & Response plan – April 2015.**

C. Avian Infections

Detection of arbovirus transmission in the bird population can be accomplished by using caged chickens as sentinels and bleeding them periodically to detect viral antibodies (serocoversions). In the Coachella Valley, 10 flocks of 7 chickens are placed in locations where mosquito abundance is known to be high or where there is a history of virus activity. Each chicken is bled biweekly, by pricking the comb and collecting blood on a filter paper strip. The blood is tested for antibodies to SLE, WEE, and WNV at the California Department of Public Health (CDPH) Viral and Rickettsial Diseases Laboratory. The District will also begin performing testing for sentinel chickens in 2015. **Sentinel housing, bleeding instructions, and testing protocols are provided in Appendix C of the California State Mosquito-Borne Virus Surveillance & Response plan – April 2015.**

D. Dead Birds

Dead birds are reported to CDPH, then brain and eye tissue is sampled and tested at the District Laboratory for WNV. The dead bird testing algorithm is provided **in Appendix D of the California State Mosquito-Borne Virus Surveillance & Response plan – April 2015.**

E. Equine Infections

Equine disease due to WEE and WNV are not a sensitive indicators of epizootic (infections only in animals) WEE and WNV activity in California. The reason for this is the widespread vaccination of equines. If confirmed cases do occur, it is a strong indication that WEE or WNV is active in the region. California Department of Agriculture (CDFA) and CDPH annually contact veterinarians to insure equine vaccinations. Besides WEE and WNV, other mosquito-borne viruses may also cause encephalitis in horses, and consequently, testing of equine specimens by CDPH has been expanded to include other viruses. **See Appendix E of the California State Mosquito-Borne Virus Surveillance & Response plan – April 2015.**

F. Human Infections

In general, human cases are not a sensitive surveillance indicator of virus activity because most human infections (>99%) have no, or only mild, symptoms. When severe encephalitis cases do occur, rarely are arboviruses suspected, and sera generally are not sent to CDPH for testing. Communication with key hospitals and local health officials has been enhanced in the last year. However, rapid detection and reporting of confirmed human cases is crucial to local mosquito control agencies in planning and expending emergency control activities to prevent additional infections. **(See Appendix F and G of the California State Mosquito-Borne Virus Surveillance & Response plan – April 2015.**

G. Data Analysis and Interpretation

1. All weather reports received from state and local agencies that can affect mosquito breeding will be reviewed and analyzed by the District staff. Weekly and biweekly mosquito occurrence reports received from the CVMVCD laboratory and from the CDPH - VBDS statewide will be used for forecasting purposes. For websites related to weather conditions refer to **Appendix I of the California State Mosquito-Borne Virus Surveillance & Response plan – April 2015.**

2. Reports from CDPH – VBDS and UCD on virus isolations in mosquito pools and chicken bloods tested, confirmed human cases and horse cases of encephalitis will be used for operational program planning.

G. Public information and education

Residents, farmers and duck club owners can play an important role in reducing the number of adult mosquitoes by eliminating standing water that may support the development of immature mosquitoes. Farmers and ranchers can ensure that irrigation practices do not allow standing water for extended periods, and duck club owners can work with mosquito control agencies to determine appropriate flooding schedules. Education regarding personal protective measures will help reduce exposure to mosquitoes (insect repellents, protective clothing time of the exposure to mosquitoes). Equally important is the education of the medical community to recognize the symptoms of WEE, SLE, and WNV and request proper laboratory testing for their conformation.

Public health officials need to be alerted if a mosquito-borne viral disease is detected, especially if the public health risk is high.

The level of public information and education depends on the conditions and required response.

Level 1: During a normal mosquito-breeding season, routine public education will be conducted.

Level 2: Emergency planning, enhanced public education will be conducted including, posted messages on the symptoms of encephalitis, public information about pesticide applications and recommendation about avoiding mosquito bites.

Level 3: Full-scale media campaign is required at this level. Coordinate with CDPH in a regional emergency response in conjunction with California Office of Emergency Service in informing, County Board of Supervisors, Local Health Departments, city, and county officials.

IV. MOSQUITO CONTROL OBJECTIVES

Mosquito control in California is conducted by over 80 local agencies, including mosquito and vector control districts, environmental health departments and county health departments.

The Coachella Valley Mosquito and Vector Control District is a Special District and public agency that operates under the California Health and Safety Code, section 2270 (2000). The District currently serves 2400 square miles and is gonverned by an 11 member board of Trustees, nine from incorporated cities and two from the County at large.
The District mission is to reduce the risk from disease carried by mosquitoes and other vectors for residents in the Coachella Valley. **See Appendix H of the California State Mosquito-Borne Virus Surveillance & Response plan for compounds approved for mosquito control in California – April 2015.**

A. Larval control

This strategy prevents producing another generation of mosquitoes capable of transmitting disease. Control of larvae is target-specific and covers a defined area. Larval mosquito control includes environmental manipulation, biological control, and chemical control.

Environmental manipulation decreases habitat availability for immature mosquitoes. It may include water management, such as conservative crop irrigation in the Coachella Valley in date and citrus orchards, drainage in the urban areas, re-circulation of water at the fish farms and water disposal through evaporation, such as at duck clubs.

Biological control uses natural predators, parasites, or pathogens to suppress immature stages of mosquitoes. In the Coachella Valley, the tadpole shrimp, *Triops longicaudatus*, is finding its use in the agricultural habitats for suppression of the nuisance species of mosquitoes. Mosquitofish, *Gambusia affinis*, are the most widely used. In the Coachella

Valley, these fish are released annually in a variety of habitats, mostly abandoned pools, and small ponds in the duck club area.

Chemical control presently includes products that are highly specific and have minimal impact on non-target organisms. These products include microbial control agents, such as *Bacillus thuringiensis israelensis* (Bti), *Bacillus sphaericus* (Bs) and spinosad. Microbial products control mosquito larvae within 24 - 48 hours, and Bti is used in short term habitats, such as irrigated dates and citrus orchards. Microbial products with a longer residual, such as *Bacillus sphaericus*, are mostly used at permanent habitats of *Culex tarsalis* where penetration of the product is not an issue, or is applied by air to force the granules through the dense vegetation. More recently developed products based on the microbial-derived spinosad toxins have become an effective tool to control immature mosquitoes. At the doses used to control mosquitoes there is little danger of nontarget impacts. Spinosad containing products come in a variety of formulations; some work quickly within 48hrs, and others have a residual effect of up to 180 days. Insect growth regulators, such as methoprene are widely in use in permanent breeding sources of *Culex tarsalis*, for instance, salt marshes along the Salton Sea and duck club ponds. Lightweight oils that create monomolecular surface films are used, but have the drawback of suffocating non-target surface breathing aquatic organisms as well. These surface products are primarily used against sources with large numbers of pupae.

B. Adult control

Adult mosquito control may be required as an additional measure to control populations of infected mosquitoes and stem an epidemic. Adult mosquito control products may be applied by ground-based equipment and fixed wing airplanes or helicopters. Many factors need to be considered when selecting a pesticide and the target area for adult mosquito control treatments. These factors may include (1) efficacy against the target species or life cycle stages, (2) pesticide resistance (3) pesticide label requirements, (4) availability of pesticide and application equipment, (5) environmental conditions (6) cost, and (7) toxicity to non-target species, including humans. The products most likely used for adult mosquito control in the Coachella Valley include pyrethrin and pyrethroids such as resmethrin, sumithrin, etophenprox, lambda-cyhalothrin and permethrin.

V. RESPONSE LEVELS

The California Mosquito-borne Virus Surveillance and Response Plan is based on conditions that exist at three response levels identified as normal season, emergency planning, and epidemic. Seven risk factors that are analyzed to determine the appropriate response level include:

- Environmental conditions (wetland surface water area, rainfall, and temperature)
- Adult mosquito vector abundance
- Virus isolation rates from mosquitoes
- Sentinel chicken seroconversion rates
- Infection rates in wild or domestic animals
- Human cases of mosquito-borne viruses
- Proximity of detected virus activity to urban or suburban regions

Each of these factors is rated on a scale of 1 to 5, with 5 representing conditions indicative of a high risk of human infection with a mosquito-borne virus. An average rating is determined for the seven factors and is correlated with the response level as follows:

- **Level 1: Normal Season (1.0 to 2.5)**
- **Level 2: Emergency Planning (2.6 to 4.0)**
- **Level 3: Epidemic Conditions (4.1 to 5.0)**

Tables 1 – 3 provide worksheets to assist in determining the appropriate rating for each of the risk factors. The term "average" refers to averages over non-epidemic years in a specific region, such as that within the boundaries of a local mosquito and vector control district. Averages typically are determined for the preceding five-year period. Roles and responsibilities of key agencies involved in carrying-out the surveillance and response plan are outlined in "Key Agency Responsibilities."

VI. MOSQUITO-BORNE VIRUS RISK ASSESSMENT TABLES

Table 1. WNV Surveillance Factor	Assessment Value	Benchmark	Value	
1. Environmental conditions Favorable environmental conditions in the Coachella Valley for virus multiplications/transmission. Considers ambient temperature and rainfall for prior 2-week period	1	Temperature ≤ 56°F		
	2	Temperature 57 - 65°F		
	3	Temperature 66 - 72°F		
	4	Temperature 73 – 79°F		
	5	Temperature ≥ 79°F		
			Cx tars	*Cx quinq*
2. Adult *Culex tarsalis and Culex quinquefasciatus* abundance Area of North and West Shore in last 5 years = female mosquitoes /trap night for prior 2-week period.	1	Vector abundance well below average (<50%)		
	2	Vector abundance below average (50–90%)		
	3	Vector abundance average (90–150%)		
	4	Vector abundance above average (150–300%)		
	5	Vector abundance well above average (>300%)		
3. Virus isolation rate in *Culex tarsalis and Culex quiqvefasciatus* mosquitoes Tested in pools of 50. Test results expressed as minimum infection rate (MIR) per 1,000 female mosquitoes tested for the prior 2-week period	1	MIR / 1000 = 0		
	2	MIR / 1000 = 0–1.0		
	3	MIR / 1000 = 1.1–2.0		
	4	MIR / 1000 = 2.1-5.0		
	5	MIR / 1000 > 5.0		
4. Sentinel chicken seroconversion rate Number of chickens in a flock that develop antibodies to a particular virus. If more than one flock is present in a region, number of flocks with seropositive chickens is an additional consideration. Typically 7 chickens/flock	1	No seroconversion in broad region		
	2	One or more seroconversions in Southern CA.		
	3	One or two seroconversions in single flock in Coachella Valley. specific region		
	4	More than two seroconversions in a single flock or two flocks with one or two seroconversions in Coachella Valley.re		
	5	More than two seroconversions per flock in multiple flocks in Coachella Valley.		
5. Dead bird infection Number if birds that have tested positive (recent infections only) for WNV during the prior 30 days.	1	No WN positive dead bird in California		
	2	WN positive dead bird in neighboring state, but not CA		
	3	One WN positive dead bird in California		
	4	One WN positive dead bird in Coachella Valley.		
	5	Multiple WN positive dead bird reported in Coachella Valley		
6. Human cases Do not include this factor in calculations if no cases are detected in region	3	One or more human infections in Southern California.		
	4	One human infection in Coachella Valley		
	5	Multiple human infections in Coachella Valley.		
			Cx tars	*Cx quinq*
Response Level / Average Rating: Normal Season (1.0 to 2.5) Emergency Planning (2.6 to 4.0) Epidemic (4.1 to 5.0)		**TOTAL**		
		AVERAGE		

Table 2. WEE Surveillance Factor	Assessment Value	Benchmark	Value
1. Environmental conditions Considers ambient temperature.	1	Temperature well below average	
	2	Temperature below average	
	3	Temperature average	
	4	Temperature above average	
	5	Temperature well above average	
2. Adult *Culex tarsalis* abundance Area of North and West Shore in last 5 years = female mosquitoes /trap night/ month	1	Vector abundance well below average (<50%)	
	2	Vector abundance below average (50–90%)	
	3	Vector abundance average (90–150%)	
	4	Vector abundance above average (150–300%)	
	5	Vector abundance well above average (>300%)	
3. Virus isolation rate in *Culex tarsalis* mosquitoes Tested in pools of 50. Test results expressed as minimum infection rate (MIR) per 1,000 female mosquitoes tested	1	MIR / 1000 = 0	
	2	MIR / 1000 = 0–1.0	
	3	MIR / 1000 = 1.1–2.0	
	4	MIR / 1000 = 2.1-5.0	
	5	MIR / 1000 > 5.0	
4. Sentinel chicken seroconversion rate Number of chickens in a flock that develop antibodies to a particular virus. If more than one flock is present in a region, number of flocks with seropositive chickens is an additional consideration. Typically 7 chickens/flock	1	No seroconversions	
	2	One seroconversion in single flock Southern California	
	3	One seroconversion in multiple flocks in Coachella Valley.	
	4	Two–three seroconversions per flock in multiple flocks in Coachella Valley.	
	5	More than three seroconversions per flock in multiple flocks in Coachella Valley.	
5. Proximity to urban or suburban regions (score only if virus activity detected) Risk of outbreak is highest in urban areas because of high likelihood of contact between humans and vectors.	1	Virus detected in rural area	
	3	Virus detected in small town or suburban area	
	5	Virus detected in urban area	
6. Human cases Do not include this factor in calculations if no cases found in region or in agency.	3	One or more human cases in Southern California	
	4	One human case in Coachella Valley.	
	5	More than one human case in Coachella Valley.	
Response Level / Average Rating: Normal Season (1.0 to 2.5) Emergency Planning (2.6 to 4.0) Epidemic (4.1 to 5.0)		**TOTAL**	
		AVERAGE	

Table 3. SLE Surveillance Factor	Assessment Value	Benchmark	Value	
1. Environmental conditions Favorable environmental conditions in the Coachella Valley for virus multiplications/transmission. Considers ambient temperature for prior 2-week period.	1	Temperature ≤ 56°F		
	2	Temperature 57 - 65°F		
	3	Temperature 66 - 72°F		
	4	Temperature 73 – 79°F		
	5	Temperature ≥ 79°F		
			Cx tars	*Cx quinq*
2. Adult *Culex tarsalis and Culex quinquefasciatus* abundance Area of North and West Shore in last 5 years = female mosquitoes /trap night for prior 2-week period.	1	Vector abundance well below average (<50%)		
	2	Vector abundance below average (50–90%)		
	3	Vector abundance average (90–150%)		
	4	Vector abundance above average (150–300%)		
	5	Vector abundance well above average (>300%)		
3. Virus isolation rate in *Culex tarsalis and Culex quiqvefasciatus* mosquitoes Tested in pools of 50. Test results expressed as minimum infection rate (MIR) per 1,000 female mosquitoes tested for the prior 2-week period	1	MIR / 1000 = 0		
	2	MIR / 1000 = 0–1.0		
	3	MIR / 1000 = 1.1–2.0		
	4	MIR / 1000 = 2.1-5.0		
	5	MIR / 1000 > 5.0		
4. Sentinel chicken seroconversion rate Number of chickens in a flock that develop antibodies to a particular virus. If more than one flock is present in a region, number of flocks with seropositive chickens is an additional consideration. Typically 7 chickens/flock	1	No seroconversion in broad region		
	2	One or more seroconversions in Southern California		
	3	One or two seroconversions in single flock in Coachella Valley.		
	4	More than two seroconversions in a single flock or two flocks with one or two seroconversions in Coachella Valley		
	5	More than two seroconversions per flock in multiple flocks in Coachella Valley.		
5. Human cases Do not include this factor in calculations if no cases are detected in region	3	One or more human infections in Southern California.		
	4	One human infection in Coachella Valley.		
	5	Multiple human infections in Coachella Valley.		
			Cx tars	*Cx quinq*
Response Level / Average Rating: Normal Season (1.0 to 2.5) Emergency Planning (2.6 to 4.0) Epidemic (4.1 to 5.0)		**TOTAL**		
		AVERAGE		

VII. CHARACTERIZATION OF CONDITIONS AND RESPONSES

Normal Season
Risk Rating: 1.0 – 2.5

Conditions:
• Average or below average rainfall; average seasonal temperatures • Mosquito abundance at or below five year average (key indicator = adults of vector species) • No virus isolations from mosquitoes • No seroconversions in sentinel chickens • No equine cases • No human cases
Response Activities by Role:
General Manager • With Scientific Operations Manager and Public Information Manager, establish and maintain routine communication with local office of emergency services personnel; obtain Standardized Emergency Management System (SEMS) training • Ensure adequate emergency funding with Administrative and Finance Manager
Scientific Operations Manager • With General Manager, and Public Information Manager establish and maintain routine communication with local office of emergency services personnel; obtain Standardized Emergency Management System (SEMS) training • With Public Information Manager, send routine notifications to physicians and veterinarians
Public Information Manager • Conduct routine public education (eliminate standing water around homes, use personal protection measures) • Release routine press notices • Send routine notifications to physicians and veterinarians
Vector Ecologist • Conduct routine mosquito and virus surveillance activities • Evaluate pesticide resistance in vector species

Lead Supervisor • Coordinate routine mosquito larval control • Inventory pesticides and equipment

Emergency Planning
Risk Rating 2.6-4.0

Conditions:
• Temperature and rainfall above average • Adult mosquito abundance >5-year average (150-300%) • One of more virus isolations from mosquitoes (MIR / 1000 is <5) • One to three chicken seroconversions per flock of 7 birds • One or two equine cases • One human case statewide • Viral activity in small towns or suburban area • Evidence of recent infection in wild birds
Response Activities by Role:
Scientific Operations Manager • Coordinate epidemic response in consultation with General Manager
Public Information Manager • Review epidemic response plan • Enhance public education (include messages on signs and symptoms of encephalitis; seek medical care if needed; inform public about pesticide applications if appropriate) • Enhance information to public health providers • Ensure notification of key agencies of presence of viral activity, including the office of emergency services
Vector Ecologist • Review epidemic response plan • Increase adult mosquito surveillance • Increase number of mosquito pools tested for virus • Review candidate pesticides for availability and susceptibility of vector mosquito species
Lead Supervisor • Review epidemic response plan • Increase surveillance and control of mosquito larvae • Coordinate localized chemical control of adult mosquitoes

• Contact commercial applicators in anticipation of large scale adulticiding
Environmental Biologist • Review epidemic response plan • Review candidate pesticides for availability and susceptibility of vector mosquito species • Identify any special environmental compliance concerns in affected area and communicate with Lead District staff.

Epidemic Conditions
Risk Rating 4.1-5.0

Conditions:
• Rainfall, temperature, wetland surface area • Adult vector population extremely high (>300%) • Virus isolates from multiple pools of mosquitoes (MIR /1000 > 5.0) • More than three seroconversions per flock of 7 birds in multiple flocks • More than two equine cases in specific region • One or more human cases in region • Virus detection in urban or suburban areas • Increased seroprevalance rates in wild bird populations or die-off of susceptible species
Response Activities by Role:
General Manager and Administrative and Finance Manager: • Ensure adequate emergency funding • Determine whether declaration of a local emergency should be considered by the County Board of Supervisors (or Local 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
Scientific Operations Manager: • Coordinate epidemic response. • Coordinate the response with the local Office of Emergency Services or if activated, the Emergency Operation Center (EOC) • Request public health exemptions from FIFRA (40 CFR 166) and emergency tolerance exemptions (40 CFR 176)
Administrative Finance Manager: • Ensure state funds and resources are available to assist epidemic control efforts.

Public Information Manager: • Conduct full scale media campaign • Alert physicians and veterinarians • Continue mosquito education and control programs until mosquito abundance is substantially reduced and no additional human cases are detected
Vector Ecologist: • With Lead Supervisor, initiate mosquito surveillance and control in geographic regions without an organized vector control program • Broaden geographic coverage of adult mosquito surveillance and arbovirus testing.
Lead Supervisor: • With Vector Ecologist, initiate mosquito surveillance and control in geographic regions without an organized vector control program • Continue enhanced larval surveillance and control of immature mosquitoes • Accelerate adult mosquito control
Environmental Biologist: • With Vector Ecologist and Lead Supervisor, accelerate adult mosquito surveillance and control • Ensure remaining environmental compliance requirements are met.

VIII. PROGRAM SUPPORT

A. Key Agency Responsibilities

1. Local Mosquito and Vector Control Agencies

- Gather, collate, and interpret regional weather data
- Monitor abundance of immature and adult mosquitoes
- Collect and submit mosquito pools for virus isolation
- Maintain sentinel chicken flocks, obtain blood samples, and send them to laboratory
- Conduct routine control of immature mosquitoes
- Conduct control of adult mosquitoes when needed
- Educate public on mosquito avoidance
- Coordinate with local Office of Emergency Services personnel
- Communicate regularly with neighboring agencies

2. Mosquito and Vector Control Association of California

- Coordinate purchase of sentinel chickens
- Receive, track, and disperse payment for surveillance expenses
- Coordinate surveillance and response activities among member agencies
- Maintain a standby contract with a large scale aerial pesticide applicator
- Serves as spokesperson for member agencies
- Establish liaisons with press and government officials

3. California Department of Health Services

- Collate adult mosquito abundance data submitted by local agencies; provide summary of data to local agencies
- Coordinate submission of specimens for virus testing
- Maintain database of all specimens tested
- Test sentinel chicken sera for viral antibodies
- Test human specimens for virus
- Distribute a weekly bulletin summarizing surveillance test results
- Send weekly surveillance results to the UC Davis interactive website
- Immediately notify local vector control agency and public health officials when evidence of viral activity is found
- Conduct epidemiological investigations of cases of equine and human disease
- Coordinate and participate in a regional emergency response in conjunction with California Office of Emergency Services
- Conduct active surveillance for human cases
- Coordinate equine and "dead bird" surveillance programs for WNV and other arboviruses
- Provide oversight to local jurisdictions without defined vector-borne disease control program
- Maintain inventory of antigens and antisera to detect exotic viruses

4. University of California at Davis (CVEC)

- Conduct research on arbovirus surveillance, transmission of mosquito-borne diseases, and mosquito ecology and control
- Provide support for testing mosquito pools for virus

- Provide a panel of tests for a wide range of viruses for identification of viruses from human, equine, bird, or arthropod vectors
- Maintain an interactive website for dissemination of mosquito-borne virus information and data
- Maintain inventory of antigens and antisera to detect exotic viruses
- Provide confirmation of tests done by local or state agencies

5. **California Department of Food and Agriculture**
   - Notify veterinarians and veterinary diagnostic laboratories about WEE and testing facilities available at UCD Center for Vector-borne Disease Research
   - Conduct necropsies on dead crows and other birds
   - Provide outreach to general public and livestock and poultry producers on the monitoring and reporting of equine and ratite encephalitides
   - Facilitate equine and ratite sample submission from the field

6. **Local Health Departments**
   - Refer human and equine specimens to CDPH for further testing
   - Notify local medical community, including hospitals and laboratories, if evidence of viral activity present
   - Participate in emergency response
   - Assist in public education

7. **Governor's Office of Emergency Services**
   - Coordinate the local, regional, or statewide emergency response under epidemic conditions in conjunction with CDPH via the Standardized Emergency Management System (SEMS)
   - Serve as liaison with the Federal Emergency Management Agency (FEMA) in the event that a federal disaster has been declared

8. **Centers for Disease Control and Prevention**
   - Provide consultation to state and local agencies in California if epidemic conditions exist
   - Provide national surveillance data to state health departments

B. Equipment

Monitoring of emergency levels of larvicide and adulticide control products will be done on a monthly basis and displayed in the monthly district inventory sheets located on the district M drive at M:\Mosquito\Inventory. If larvicide or adulticide levels fall below or are in danger of falling below the emergency treatment level capability, steps will be taken to replenish inventory levels to meet the emergency requirements.

APPLICATION EQUIPMENT

Equipment	*Number in use*
1. Hand Cans (1 gal)	42
2. Hand Spreaders	30
3. Maruyama Back Sprayers	29
4. Hand Backpack Sprayers	35
5. Argo – all terrain vehicle	2
6. Powered Liquid Skid Mounted Sprayer	3
7. ATV - quadbike	2
8. ATV - ranger	2
9. London Fog ULV Model 18-20	2
10. Guardian Model 190ES ULV Sprayer	1
11. Longray Portable Electric Fog Generator	2
12. Colt Hand Portable Fog Generator	3

Aerial applicators available for contact

1. Salton Sea Air Service, Inc.
   101-111 Desert Air Drive
   North Shore, CA 92254

2. Clarke Environmental Mosquito Management, Inc.
   110 East Irving Park Road, 4th Floor
   Roselle, IL 60172-9963
   Telephone: (800) 323-5727

C. Control Products

LARVAL CONTROL

Products –The District will maintain an emergency larval control product inventory to control 540 acres of mosquito breeding habitat for 14 consecutive days. This level would be sufficient for District personnel to evaluate the scope and magnitude of the emergency, formulate a specific response plan, and procure additional control products if needed.

The following products are stored at the District and emergency response amounts will be available in combination to treat the listed acreage seasonally.

Product	Classification	Treatment Rate	Treatment Capability and Seasonal Availability
Agnique MMF	Pupacide	1 gal./Ac.	40 acres for 14 days – year round
Kontrol	Pupacide	2 gal./Ac	
Altosid XR-G	IGR	10 lbs./Ac.	150 acres for 14 days – April through October. 250 acres for 14 days November through March.
Altosid Liquid	IGR	3-4 oz./Ac.	
Altosid Pellets	IGR	7.5 lbs./Ac.	
Aquabac 200G	Biological	10 lbs./Ac.	250 acres for 14 days – April through October
Vectobac G	Biological	10 lbs./Ac	
VectoMax FG	Biological	10 lbs./Ac.	
Natular G	Spinosad	9 lbs./Ac.	100 acres for 14 days – April through October. 250 acres for 14 days – November through March.
Natular 2EC	Spinosad	2-6.4 fl. oz./Ac.	
Natular G30	Spinosad	10 lbs./Ac.	

ADULT CONTROL

Products – District emergency adult mosquito control product inventory for rural areas of the Coachella Valley is estimated to be 250 acres, (35,000 linear feet), for 10 days ground fogging, plus 640 acres for 10 days for aerial ULV treatments. Urban control is estimated to be 250 acres, (35,000 linear feet), for 10 days ground ULV. In addition, barrier treatment products capable of treating 4 acres, (29,000 linear feet by 6 foot), will also be available for emergency response. This level would be sufficient for district personnel to evaluate the scope and magnitude of the emergency, formulate a specific response plan, and procure additional control products if needed.

District personnel may substitute products based on product availability, mosquito population resistance studies, and environmental impacts.

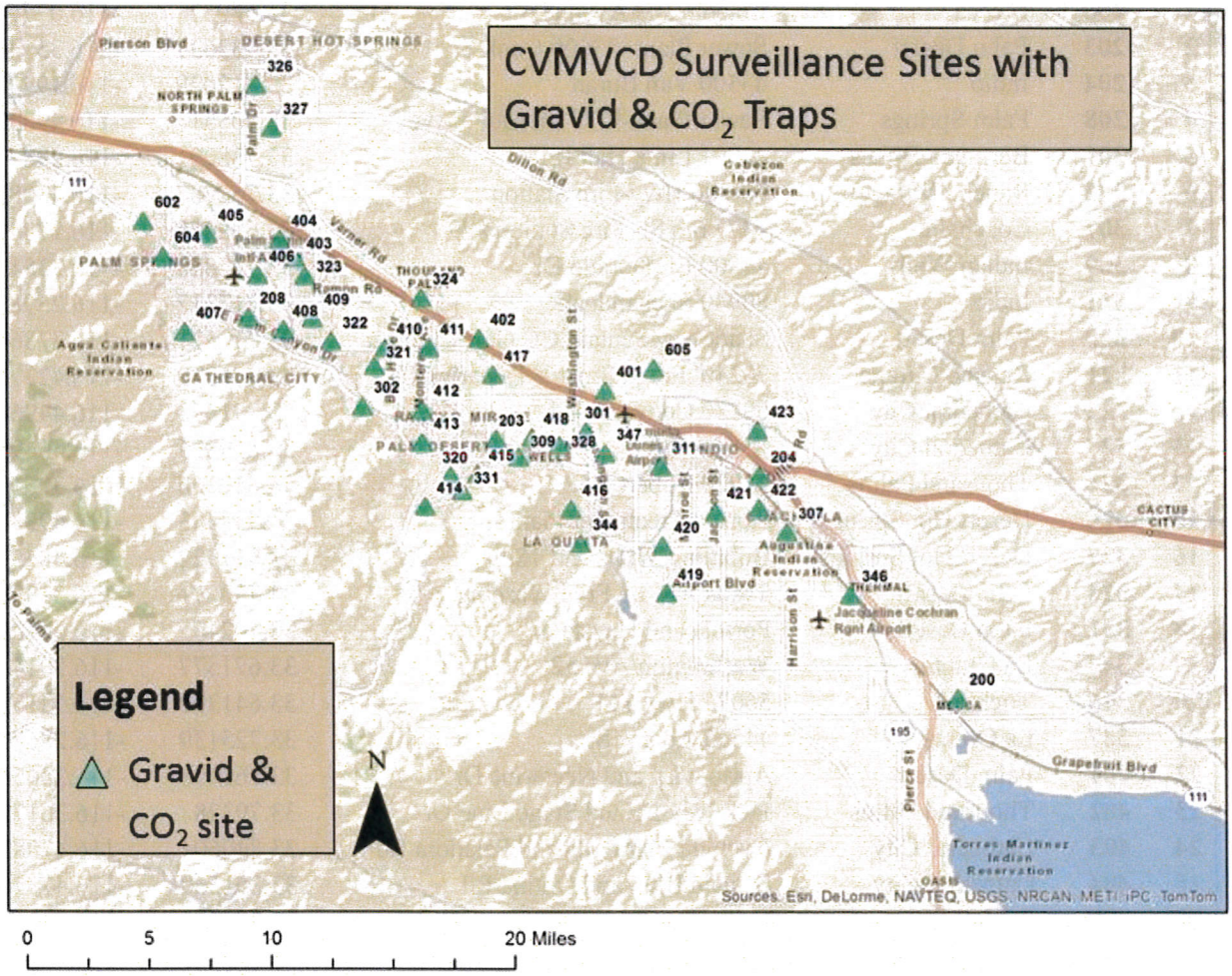
Adulticide Product	Treatment Rate	**Treatment Capability**
Anvil 10+10	0.622 oz. Anvil 10+10/Ac.	**6400 acres – rural fogging**
Pyrocide 7396	2.15 oz. Pyrocide 7396/ Ac.	**2500 acres – urban fogging**
Aquareslin	0.536 oz. Aquareslin/Ac.	**2500 acres – urban fogging**
Aquareslin	7.7 fl. oz./Ac. barrier treatment	**4 acres Barrier treatments**
Demand CS	10 fl. oz./ Ac. barrier treatment	

EMERGENCY CONTROL PRODUCT MONITORING

Monitoring of emergency levels of larvicide and adulticide control products will be done on a monthly basis and displayed in the monthly district inventory sheets located on the district M drive at M:\Mosquito\Inventory. If larvicide or adulticide levels fall below or are in danger of falling below the emergency treatment level capability, steps will be taken to replenish inventory levels to meet the emergency requirements.

IX. APPENDICES

Appendix A.1 – Map of Surveillance Locations with Gravid and CO_2 Traps in the Coachella Valley

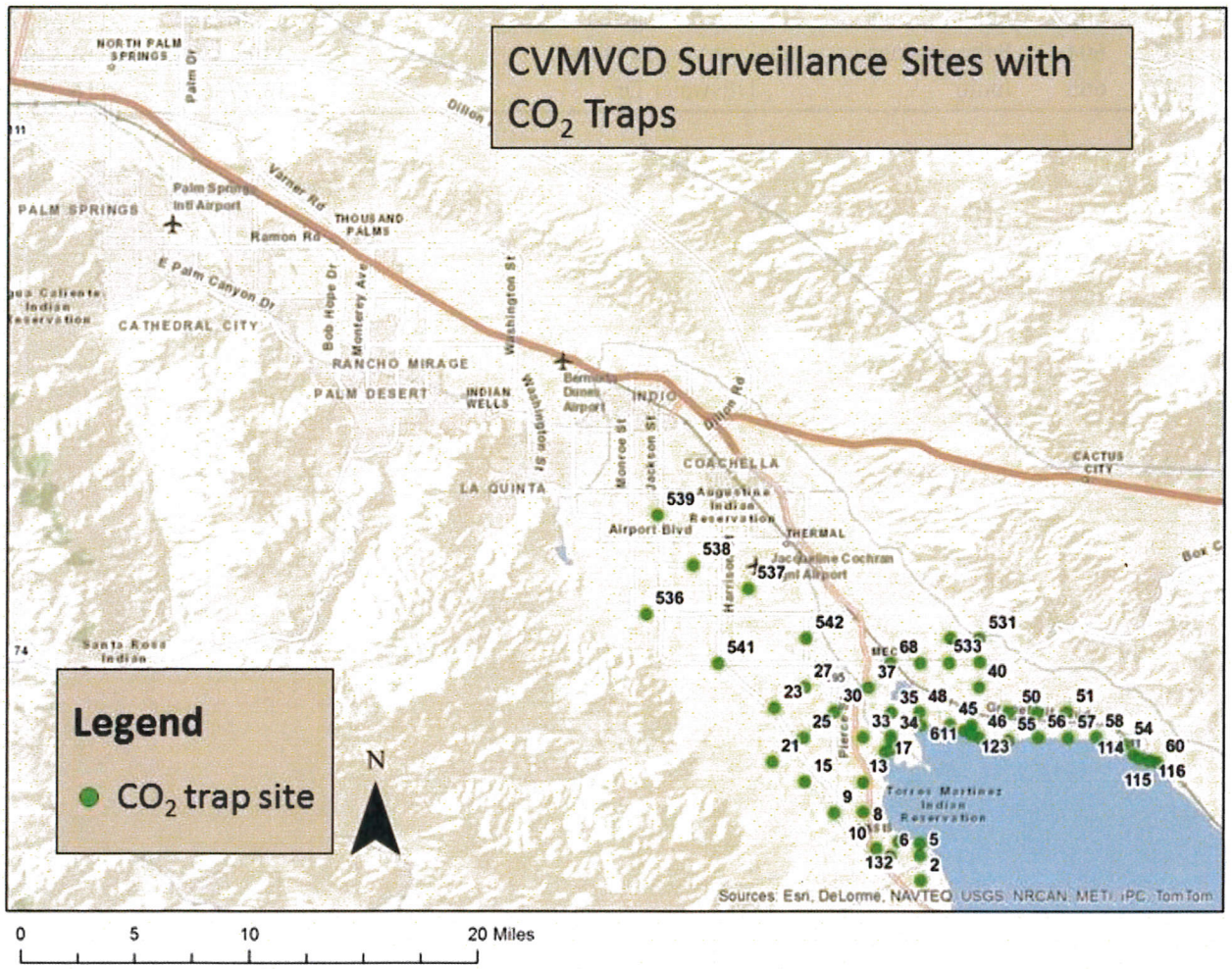


Appendix A.2 – List of Sites with Gravid and CO_2 Trap Locations in the Coachella Valley

No.	*Site ID*	*City*	*Location Description*	*Latitude*	*Longitude*
1	**200**	Mecca	Lincoln and Avenue 65	33.58057	-116.077744
2	**203**	Palm Desert	Sewer Plant- 43000 Cook St	33.733537	-116.351461
3	**204**	Indio	45500 Van Buran	33.712029	-116.19472
4	**208**	Palm Springs	Sewer Plant-4375 Mesquite Ave	33.80551	-116.498372
5	**301**	Bermuda Dunes	42901 Lima Hall Rd	33.738091	-116.298
6	**302**	Rancho Mirage	70-800 Hwy-Fire Station	33.752787	-116.43083
7	**307**	Coachella	1377 6th St- Fire Station #79	33.678478	-116.17849
8	**309**	Indian Wells	44900 EL Dorado Dr	33.722858	-116.33811
9	**311**	Indio	80940 Shenandoah	33.717312	-116.2538
10	**320**	Palm Desert	Shadow Mountain CC Golf Club Ln	33.711571	-116.37869
11	**321**	Rancho Mirage	70240 Frank Sinatra Tamarisk CC	33.776779	-116.42374
12	**322**	Cathedral City	69380 Converse Rd	33.791478	-116.449645
13	**323**	Cathedral City	Ximino Rd	33.829895	-116.464957
14	**324**	Thousand Palms	31920 Robert Rd	33.817166	-116.396122
15	**326**	Desert Hot Springs	Horton Treatment Plant	33.943333	-116.493889
16	**327**	Desert Hot Springs	Bubbling Wells and 18th	33.917922	-116.484575
17	**328**	Palm Desert	Texas Ave by Fred Warning	33.730071	-116.313953
18	**331**	Palm Desert	Portola and Haystack	33.70248	-116.37198
19	**344**	La Quinta	Washington/Ave 52	33.671577	-116.3014
20	**346**	Thermal	56075 Hwy 111	33.641392	-116.14132
21	**347**	La Quinta	44555 Adams St	33.725139	-116.286773
22	**401**	Palm Desert	Apricot Ln and Nectarine Dr	33.762498	-116.286569
23	**402**	Thousand Palms	Jack Ivey Dr and Stage Line Dr	33.79328	-116.361724
24	**403**	Cathedral City	Avenida Maravilla and Peladora Rd	33.840604	-116.470828
25	**404**	Cathedral City	Landau Blvd and Ontina Rd	33.851569	-116.479707
26	**405**	Palm Springs	N Cerritos Rd and E Powell Rd	33.854673	-116.52311
27	**406**	Palm Springs	San Joaquin Dr and Diamond Rd	33.830473	-116.493034
28	**407**	Palm Springs	E Marion Way and Yucca Pl	33.796928	-116.536236
29	**408**	Palm Springs	Lawrence St and Martha St	33.798006	-116.477619
30	**409**	Cathedral City	Date Palm Dr and Ortega Rd	33.80482	-116.460464
31	**410**	Rancho Mirage	Oakmont Dr and Pinewood Cir	33.787414	-116.417516
32	**411**	Rancho Mirage	Paris Way and Victor Hugo Rd	33.787475	-116.391408
33	**412**	Rancho Mirage	Vista Dunes Rd and Calle La Reina	33.750953	-116.395504
34	**413**	Palm Desert	Monterey Ave and Parkview Dr	33.731428	-116.395485
35	**414**	Palm Desert	Quail Hollow Dr and Shady View Dr	33.693441	-116.393893
36	**415**	Indian Wells	Vintage Dr W and Wren Dr	33.712899	-116.362891
37	**416**	La Quinta	Avenida El Nido & Avenida Fernando	33.691862	-116.307095
38	**417**	Palm Desert	Vista Royale Dr and Desert Falls Dr	33.771598	-116.353434
39	**418**	Indian Wells	Via Orvieto and Via Uzzano	33.734619	-116.330152

40	**419**	La Quinta	Madison St and Airport Blvd	33.642348	-116.250393
41	**420**	La Quinta	Via Savona and Via Dona	33.670096	-116.252775
42	**421**	Indio	Burnett Dr and Freeman Ct	33.690273	-116.221029
43	**422**	Coachella	Meadows Ln and Brianne Ln	33.69262	-116.194968
44	**423**	Indio	Canzone Dr and Acqua Ct	33.738833	-116.195902
45	**602**	Palm Springs	Mountain gates	33.862434	-116.560769
46	**604**	Palm Springs	270 Vereda Norte	33.841503	-116.549117
47	**605**	Indio	Ullswater Dr	33.775625	-116.257544

Appendix B.1 – Map of Surveillance Locations with only CO_2 Traps in the Coachella Valley

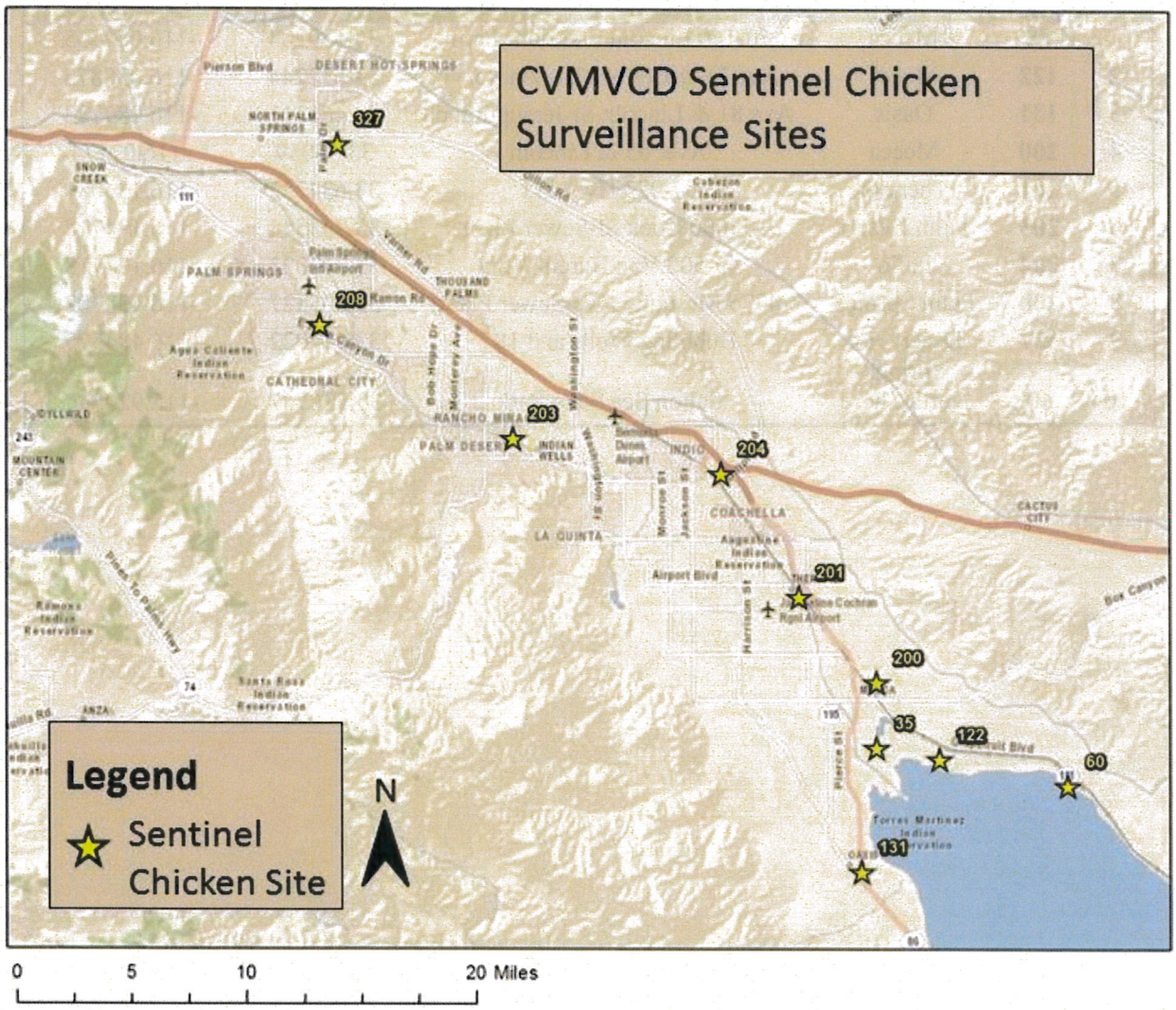


Appendix B.2 – List of Surveillance Locations with only CO_2 Traps in the Coachella Valley

No.	*Site ID*	*City*	*Site Description*	*Latitude*	*Longitude*
1	**2**	Oasis	Johnson and Avenue 84	33.44056	-116.0607
2	**5**	Oasis	Johnson and Avenue 82	33.45524	-116.061172
3	**6**	Oasis	Lincoln and Avenue 82	33.4549	-116.078977
4	**8**	Oasis	Buchanan and Avenue 80	33.47019	-116.094818
5	**9**	Thermal	Pierce and King St	33.48065	-116.112692
6	**10**	Oasis	Buchanan and Avenue 79	33.48105	-116.095336
7	**13**	Thermal	Buchanan and Avenue 76	33.49877	-116.095372
8	**15**	Thermal	Filmore and Avenue 76	33.49896	-116.130198
9	**17**	Mecca	Lincoln and Avenue 73	33.5168	-116.082468
10	**21**	Thermal	Polk and Avenue 74	33.51079	-116.149466
11	**23**	Thermal	Polk and Avenue 70	33.54264	-116.148191
12	**25**	Thermal	Filmore and Avenue 72	33.52516	-116.131143
13	**27**	Thermal	Filmore and Avenue 68	33.55503	-116.130245
14	**30**	Mecca	Pierce and Avenue 70	33.54028	-116.112702
15	**33**	Mecca	Buchanan and Avenue 72	33.52522	-116.095513
16	**34**	Mecca	Lincoln and Avenue 72	33.52597	-116.078921
17	**35**	Mecca	Lincoln and Avenue 70	33.53999	-116.078863
18	**37**	Mecca	Buchanan and Avenue 68	33.55476	-116.092281
19	**40**	Mecca	Hayes and Avenue 68	33.55494	-116.026518
20	**43**	Mecca	Garfield and Avenue 70	33.54023	-116.008863
21	**45**	Mecca	Grant and Avenue 71	33.53269	-116.043672
22	**46**	Mecca	Hayes and Avenue 72	33.52538	-116.026382
23	**48**	Mecca	Johnson and Avenue 70	33.54005	-116.061755
24	**50**	Mecca	Arthur and Avenue 70	33.53997	-115.991758
25	**51**	Mecca	Cleveland and Avenue 70	33.54041	-115.974133
26	**54**	Northshore	Vanderveer and Avenue 73	33.52112	-115.939335
27	**55**	Mecca	Garfield and Avenue 72	33.5237	-116.008858
28	**56**	Mecca	Arthur and Avenue 72	33.52537	-115.991129
29	**57**	Meca	Cleveland and Avenue 72	33.52499	-115.97331
30	**58**	Northshore	Avenue 72 East of Cleveland	33.52548	-115.956632
31	**60**	Northshore	Salton Sea State Park	33.51077	-115.920793
32	**68**	Mecca	Lincoln and Avenue 66	33.56922	-116.079206
33	**114**	Northshore	Desert Mobile Home Park	33.51517	-115.93451
34	**115**	Northshore	Mecca Ave	33.51268	-115.930857
35	**116**	Northshore	South of Tripoli Rd	33.51122	-115.925506
36	**121**	Mecca	Colfax and Avenue 72	33.52908	-116.035213
37	**122**	Mecca	Gordon's Ranch	33.53225	-116.030868
38	**123**	Mecca	South of Gordon Ranch	33.52697	-116.030798
39	**130**	Oasis	Johnson and Avenue 81	33.46238	-116.061245

40	**131**	Oasis	81st Ave and Hwy 86	33.45942	-116.087272
41	**132**	Oasis	Johnson and Avenue 81	33.46359	-116.074278
42	**140**	Mecca	Johnson and Avenue 66	33.56911	-116.061466
43	**530**	Mecca	Grant and Avenue 64	33.58396	-116.04366
44	**531**	Mecca	Hayes and Avenue 64	33.5838	-116.026346
45	**532**	Mecca	Grant and Avenue 66	33.56923	-116.044161
46	**533**	Mecca	Hayes and Avenue 66	33.56967	-116.026249
47	**536**	Thermal	Orchid and Avenue 62	33.59809	-116.224755
48	**537**	Thermal	Tyler and Avenue 60	33.61307	-116.164041
49	**538**	Thermal	Van Buren and Avenue 58	33.62715	-116.196887
50	**539**	Coachella	Jackson and Avenue 54	33.65671	-116.218393
51	**540**	Mecca	Lincoln and Avenue 73	33.51823	-116.078914
52	**541**	Mecca	Harrison and Avenue 66	33.56895	-116.181827
53	**542**	Mecca	Fillmore and Avenue 64	33.58387	-116.129596
54	**610**	Mecca	Lincoln near Whitewater Channel	33.523498	-116.078744
55	**611**	Mecca	End of Johnson	33.532468	-116.060957

Appendix C.1 - Map of Sentinel Chicken Flock Locations in the Coachella Valley



Appendix C.2 - List of Sentinel Chicken Flock Locations in the Coachella Valley

No.	Site ID	City	Location Description	Latitude	Longitude
1	**35**	Mecca	70-140 Lincoln St-Adohr Farm	33.539204	-116.077955
2	**122**	Mecca	Ave 71 & Colfax-Gordon Ranch	33.532244	-116.030875
3	**131**	Oasis	Ave 81 & Lincoln St-Jessup Ranch	33.461111	-116.089722
4	**200**	Mecca	Ave. 65 & Lincoln	33.58059	-116.07774
5	**201**	Thermal	57-023 Hwy 111	33.634752	-116.136081
6	**203**	Palm Desert	43000 Cook St-Sewer Plant	33.733544	-116.194718
7	**204**	Indio	45-500 Van Buren- VSD	33.712023	-116.194718
8	**208**	Palm Springs	4375 Mesquite Ave-Sewer Plant	33.805527	-116.498382
9	**327**	Desert Hot Springs	Bubbling Wells and 18th	33.917922	-116.484575
10	**60**	North Shore	Salton Sea State Park	33.510767	-115.920793

Appendix D - Table 4. Annual and monthly total and average rainfall (in.) for the Coachella Valley

MONTH	2010	2011	2012	2013	2014	5 yr Avg.
JANUARY	2.55	0	0	0.15	0	**0.54**
FEBRUARY	0.41	0.18	0.03	0	0.08	**0.14**
MARCH	0.24	0	0.03	0.07	0	**0.07**
APRIL	0	0	0.06	0	0	**0.01**
MAY	0	0	0	0	0	**0.00**
JUNE	0	0	0	0	0	**0.00**
JULY	0	0.08	0.37	0.08	0	**0.11**
AUGUST	0	0	0.2	1.14	0.29	**0.33**
SEPTEMBER	0.01	0.46	1.42	0.14	0.13	**0.43**
OCTOBER	0.72	0	0	0	0	**0.14**
NOVEMBER	0	0.22	0	0.06	0	**0.06**
DECEMBER	0.37	0.06	0.09	0	0.13	**0.13**
YR TOTAL	**4.3**	**1**	**2.2**	**1.64**	**0.63**	**1.95**

*This data used for surveillance factor # 1 in the Mosquito Borne Virus Risk Assessment Table calculations for WNV, WEE, and SLE on pages 9 – 11 of the Coachella Valley Mosquito Borne Virus Surveillance and Emergency Response Plan.

Appendix E – Table 5. Average Minimum and Maximum temperatures (°F) in the Coachella Valley

	2010			2011			2012			2013			2014			5-Year Average		
Month	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min	Max	Avg	Min
Jan 1-15	73	55	37	66	51	35	76	56	36	64	49	32	75	55	35	70	53	36
Jan 16-31	65	54	42	76	58	40	74	57	38	72	57	46	80	62	44	73	57	42
Feb 1-14	70	57	44	71	53	34	76	58	40	74	58	49	75	59	43	72	56	41
Feb 15-28	74	60	45	67	55	42	75	59	43	73	56	37	82	64	45	73	58	42
Mar 1-15	72	59	45	82	65	48	79	61	42	84	66	47	84	67	49	79	63	46
Mar 16-31	83	65	47	80	66	51	81	65	48	89	73	56	86	69	51	83	67	50
Apr 1-15	79	64	48	83	69	54	83	66	48	88	73	58	89	72	54	83	68	52
Apr 16-30	85	69	53	89	75	61	96	78	59	92	75	57	90	75	58	91	74	58
May 1-15	91	75	59	91	74	56	98	82	65	96	79	61	95	77	59	95	79	61
May 16-31	91	76	61	89	75	62	101	84	66	97	82	66	100	83	66	96	80	64
Jun 1-15	99	83	67	96	81	65	103	85	68	105	87	68	107	90	72	99	83	67
Jun 16-30	104	87	70	106	88	70	108	90	71	107	91	75	105	88	71	106	89	72
Jul 1-15	106	91	74	106	92	78	106	92	77	107	94	81	108	93	78	107	92	77
Jul 16-31	107	93	77	105	91	76	105	90	75	105	93	80	109	96	82	107	93	78
Aug 1-15	105	89	72	107	91	74	111	96	81	106	88	70	103	90	77	106	91	72
Aug 16-31	106	91	76	110	93	76	104	92	79	104	91	78	105	90	75	106	91	76
Sep 1-15	103	85	66	102	88	73	103	89	75	104	90	75	105	90	74	103	88	72
Sep 16-30	103	85	67	102	84	66	105	87	69	98	81	63	100	86	71	102	84	65
Oct 1-15	93	79	61	93	77	60	96	81	65	87	71	55	96	77	58	91	76	59
Oct 16-31	82	70	57	92	73	58	90	73	56	88	70	51	92	76	60	88	71	55
Nov 1-15	84	66	48	73	58	42	82	64	47	84	65	46	82	66	50	81	64	46
Nov 16-30	69	54	38	76	59	41	80	63	45	73	60	47	77	58	39	75	59	42
Dec 1-15	76	57	38	65	50	34	74	60	45	68	51	34	73	61	48	70	54	38
Dec 16-31	66	57	47	70	53	36	65	49	32	74	56	37	66	52	37	69	53	37

* This data used for surveillance factor # 1 in the Mosquito Borne Virus Risk Assessment Table calculations for WNV, WEE, and SLE on pages 9 – 11 of the Coachella Valley Mosquito Borne Virus Surveillance and Emergency Response Plan.

APPENDIX F – Risk Assessment Maps used in calculating montly risk assessment values for Coachella Valley, urban, agricultural, North Shore, West Shore, and Duck Club Areas of the Salton Sea.

The seasonal transmission risk of the arboviruses WNV, WEE and SLE in the Coachella Valley, among other factors, is related to temperature, rainfall, mosquito infection rates, and vector abundance and population size of vertebrate hosts. Some of these factors are used on a bi-weekly basis to determine level of risk for WNV, SLE, and WEE virus transmission in various areas or zones of the Valley. Some of the zones used to calculate arbovirus transmission risk are shown in the figures below. For the surveillance zones around the Salton Sea (Figure 3), tables 7, 8 and 9 present the average number of *Cx. tarsalis* and *Cx. quinquefasciatus* female mosquitoes per trap per month.

Figure 1 - Map of the Coachella Valley risk assessment zone.

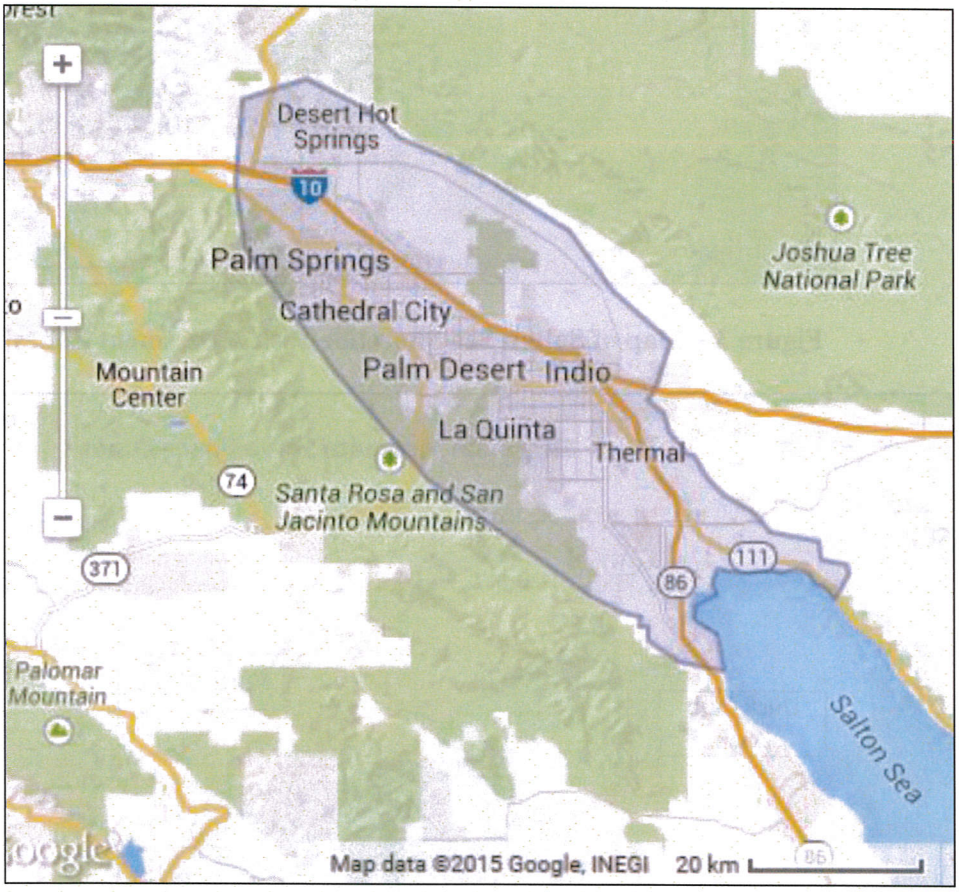


Figure 2. Map of urban and agricultural risk assessment zones.

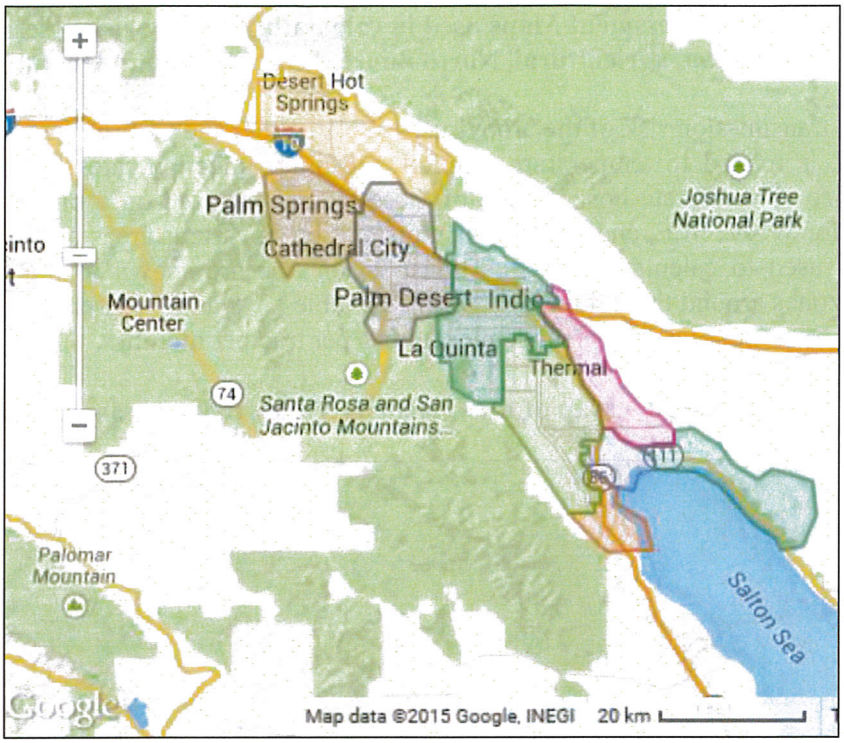


Figure 3 - Map of Salton Sea Shoreline Risk Assessment Zones

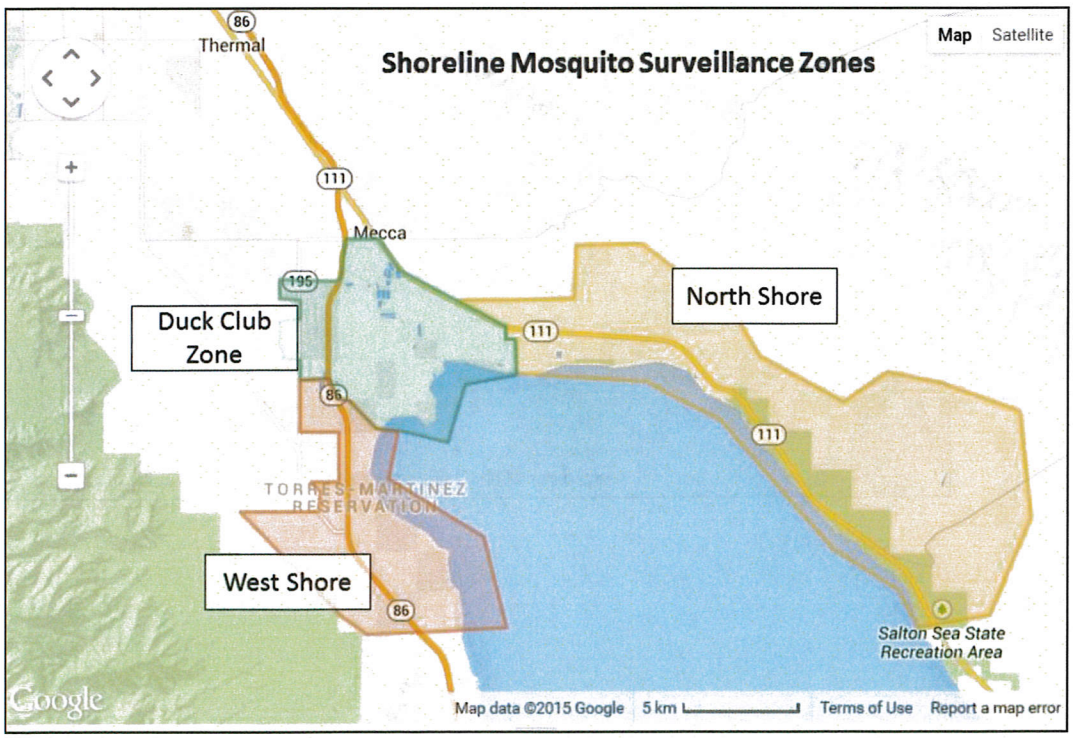


Table 7. North Shore Average Number of Vector Mosquitoes

MONTH	2010	2011	2012	2013	2014	*5-yr AVG*
JAN	5	40	25	123	68	*48*
FEB	21	30	12	31	77	*23*
MAR	117	39	65	102	138	*82*
APR	113	87	373	119	118	*147*
MAY	38	23	155	128	28	*85*
JUN	38	12	12	26	17	*19*
JUL	4	3	57	8	23	*15*
AUG	1	1	19	2	11	*5*
SEP	3	21	35	13	19	*16*
OCT	31	67	113	13	51	*48*
NOV	6	3	24	3	38	*8*
DEC	26	2	34	7	16	*16*

Table 8. Duck Club Zone Average Number of Vector Mosquitoes

MONTH	2010	2011	2012	2013	2014	*5-yr Avg*
JAN	55	240	39	162	77	*221*
FEB	236	118	51	54	98	*119*
MAR	811	511	400	639	491	*558*
APR	581	533	679	434	439	*492*
MAY	227	48	1088	598	58	*454*
JUN	282	170	80	193	122	*180*
JUL	68	45	53	49	69	*52*
AUG	48	54	65	52	160	*55*
SEP	151	639	807	217	414	*391*
OCT	596	536	2415	237	1590	*799*
NOV	31	29	201	74	421	*90*
DEC	193	10	304	19	47	*129*

Table 9. West Shore Average Number of Vector Mosquitoes

MONTH	2010	2011	2012	2013	2014	*5-yr Avg*
JAN	66	203	94	13	44	*120*
FEB	157	99	123	45	80	*92*
MAR	419	240	379	439	228	*324*
APR	709	309	1089	680	171	*577*
MAY	425	110	768	692	49	*449*
JUN	364	56	145	149	26	*163*
JUL	123	118	23	21	8	*63*
AUG	324	31	56	14	3	*86*
SEP	87	118	70	23	19	*71*
OCT	221	205	150	18	107	*137*
NOV	32	15	19	6	42	*24*
DEC	229	21	54	6	13	*73*