City of Moorpark

CITY ENGINEERING/PUBLIC WORKS DEPARTMENT
799 Moorpark Avenue, Moorpark, California 93021 (805) 517-6256 fax (805) 532-2555

June 1, 2011

State Water Resources Control Board
P.O. Box 100
Sacramento, CA 95812-0100
Attn: Mathew Freese, Student Assistant

Subject: City of Moorpark Vector Control District
Notice of Intent to apply Aquatic Larvicides and Adulticides for Vector Control as part of the City's Integrated Vector Management Program.

Enclosed is the City of Moorpark's updated Notice of Intent for Water Quality Order No. 2011-0002-DWQ, effective October 31, 2011. The updated documents reflect the State Water Board's updated Water Quality Order Number. The City has also updated its original PAP to include a new Section 3 on Page 9. It is the City's understanding that the previous payment of $136.00 will be considered the payment for the City's NOI, as the original NOI was never fully processed. I have enclosed a copy of the processed check. If you have any questions or comments please feel free to contact me at 805-517-6257, or, skroes@ci.moorpark.ca.us.

Sincerely,

Shaun Kroes
Senior Management Analyst

Enclosures

C: Dave Klotzle, City Engineer/Public Works Director
John Brand, Senior Management Analyst
Mark Westerline, Animal/Vector Control Specialist

S:\Public Works\Everyone\NPDES\Vector Control Permit\June 1, 2011 Cover Letter (new permit).docx

ATTACHMENT G – NOTICE OF INTENT

WATER QUALITY ORDER NO. 2011-0002-DWQ
GENERAL PERMIT NO. CAG 990004

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# _____

II. DISCHARGER INFORMATION

A. Name City of Moorpark			
B. Mailing Address 799 Moorpark Avenue			
C. City Moorpark	D. County Ventura	E. State CA	F. Zip Code 93021
G. Contact Person Mark Westerline	H. Email address mwesterline@ci.moorpark.ca.us	I. Title Vector/Animal Control Specialist	J. Phone 805-517-6290

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.
   [X] Name of the conveyance system: Moorpark Storm Drain System

2. Canals, ditches, or other constructed conveyance facilities owned and controlled by an entity other than the Discharger.
   [X] Owner's name: Ventura County Watershed Protection District
   Name of the conveyance system: Walnut Canyon Storm Drain; Drain No. 2

3. Directly to river, lake, creek, stream, bay, ocean, etc.
   [X] Name of water body: Arroyo Simi

   * 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 4
(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: X Vector Larvae N/A Adult Vector

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

See attached PAP, which details information for each pesticide.

C. Period of Application: Start Date 10/31/2011 End Date 02/29/2016

D. Types of Adjuvants Added by the Discharger: See attached PAP

VI. PESTICIDES APPLICATION PLAN

A. Has a Pesticides Application Plan been prepared?*
[X] Yes [ ] No

If not, when will it be prepared? _____

* A copy of the PAP shall be included with the NOI.

B. Is the applicator familiar with its contents?
[X] 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 Payment already provided (see copied check).

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 General Permit, including developing and implementing a monitoring program, will be complied with."

A. Printed Name: Steven Kueny

B. Signature: Steven Kueny **Date:** 6/2/11

C. Title: City Manager

X. FOR STATE WATER BOARD USE ONLY

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

The City of Moorpark Vector Control Division
Pesticide Application Plan
Best Management Practices and Monitoring Plan

FOR WATER QUALITY ORDER NO 2011-0002-DWQ STATEWIDE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT FOR BIOLOGICAL AND RESIDUAL PESTICIDE DISCHARGES TO WATERS OF THE UNITED STATES FROM VECTOR CONTROL APPLICATIONS(GENERAL PERMIT) NO. CAG990004

Background

The City of Moorpark Vector Control Division (Division), within the jurisdiction of the Region 4 Water Quality Control Board, is seeking coverage under the General Permit as a public entity that applies aquatic pesticides for vector control to waters of the United States.

According to the California State Water Quality Control Board's document "California Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California" (http://www.waterboards.ca.gov/water_issues/programs/state_implementation_policy/docs/final.pdf), the District may receive an exception from meeting the priority pollutant criteria/objectives of the document from the Regional Water Quality Control Board (RWQCB) if it:

1. complies with the California Environmental Quality Act (CEQA)

2. is necessary for resource or pest management i.e., vector or weed control, pest eradication, or fishery management

The statutory mandates that govern how the Division operates are found in the California Health and Safety Code (Sec 2000-2007, 2040-2060).

Extensive research has indicated that the pesticides applied directly to water to kill mosquito larvae have little or no lasting environmental impact. *Bacillus thuringiensis* var. *israelensis, B. sphaericus,* s-methoprene, and surfactants degrade rapidly in the environment, leaving negligible residue. When integrated with other strategies, e.g., managing habitat and using mosquitofish, these aquatic pesticides are part of effective best management practices (BMPs).

As required by the General Permit we present and discuss our BMPs and monitoring plan. The Division uses environmentally safe practices to control vectors and minimize impact to non-target organisms. Aquatic pesticides are applied at rates that do not alter the physical parameters of the environment, i.e., temperature, salinity,

turbidity, and pH. This monitoring plan presents and justifies exemptions to requirements of the General Permit.

Division Boundaries and Target Areas

The Division is bound by the Moorpark city limits within the county of Ventura (Figure 1 attached). Any site that holds water for more than 96 hours (4 days) can produce mosquitoes. Source reduction is the Division's preferred solution; whenever possible, the Division works with property owners to effect long-term solutions to reduce or eliminate the need for continued applications as described in Best Management Practices for Mosquito Control in California. The typical sources treated by this Division:

1. Any and all navigable waters within the City of Moorpark that breed mosquitoes.
2. Flood control channels, basins, freeway drains, storm drains and any other conveyance for water runoff in an urban/suburban area.
3. Roadside low-spots, backyard ponds and pools.

Best Management Practices

The Division was originally formed pursuant to the California Health and Safety Code in 1960 as the Moorpark Mosquito Abatement to help control flies and mosquitoes produced by numerous egg ranches in the Moorpark area and the district and its mosquito control program were absorbed by the City of Moorpark in 1997 with major emphasis on controlling and monitoring mosquitoes and the potential diseases they can spread such as the West Nile Virus (WNV). The Division is indirectly regulated by the Department of Pesticide Regulation (DPR) through a cooperative agreement between the Division and the California Department of Public Health (CDPH).

Division personnel who apply pesticides are licensed by the CDPH and pesticide use is reported to the Ventura County Agricultural Commissioner (CAC) according to an annual Memorandum of Understanding among the DPR, CDPH, and CAC, and vector control agencies pursuant to Health and Safety Code Section 116180. The CAC conducts routine inspections of the Division to ensure we are complying with the provisions of the cooperative agreement. Applicators are required to complete pesticide training yearly as part of a two year continuing education cycle.

Division staff monitors application equipment on a daily basis to ensure it remains in proper working order. Spill mitigation devices are placed in all spray vehicles and pesticide storage areas to respond to spills. Vehicles normally carry less than five gallons of liquid larvicide and less than 40 pounds of granular larvicides. Employees are trained on spill prevention and response annually and how to report a potential spill. All spray equipment is calibrated each year and is a part of the MOU with CDPH to help ensure minimal and consistent use of larvicides.

The US Environmental Protection Agency (USEPA) and DPR require that aquatic pesticides undergo tests for toxicity and meet specific requirements before the pesticide is registered for application to surface waters. The USEPA has found that applying properly registered aquatic pesticides does not threaten people and the environment. The effects of these pesticides on water quality will be mitigated by complying with the requirements of the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), using BMPs, and monitoring.

The Division's best management practices are based on integrated vector management (IVM) strategies. The components of the programs are:

1. Public education
2. Surveillance of vector populations
3. Disease surveillance
4. Determining thresholds
5. Selecting control method(s)
6. Training and certifying applicators

1. Public Education

Division staff utilizes various outreach techniques to reach residents, gain cooperation, and change behavior so the risk of mosquito-transmitted disease is reduced. Many behavioral elements such as maintaining properties to eliminate standing water, reducing urban runoff, and preventing trash accumulation in natural areas can reduce the need to apply public health pesticides. To ensure the widest reach, multilingual (English/Spanish) methodologies ranging from direct contact to large scale media campaigns are used.

A. School Programs:
Presentations, classroom loan/study materials, curricula, are available to all public and private school teachers and students.

B. Community Outreach:
Information and programs are provided to local civic groups, community service groups, homeowner associations, local businesses, and at community safety/health fairs, senior centers and others.

C. Media Outreach:
Residents are kept informed through local and regional media outreach via press releases, press conferences, and local and regional media campaigns including public service announcements and paid media advertising.

2. Surveillance of Vector Populations

Surveillance limits pesticide use to areas where mosquito populations may affect public health. The thirteen (13) species of mosquitoes known within the City (Table 1) differ in their biology, susceptibility to larvicides, and ability to create nuisances and transmit disease. Information on the species, density, and stages present is used to select an appropriate control strategy based on integrated vector management.

A. Larval Surveillance:

Vector Control Technicians are assigned to zones within the Division. They maintain a database of sites which are known to produce mosquitoes and inspect them regularly. They also search continuously for new sources of standing water and mosquitoes. Treatments are based on the abundance, species, and stage of mosquitoes present.

B. Adult Mosquito Surveillance:

Populations of adult mosquitoes are also sampled by trapping and tested for infections with viruses that can be transmitted to humans. The spatial and seasonal abundance of adult mosquitoes is monitored and compared to historical data. Control operations are concentrated in areas where adult populations are above seasonal averages and/or where disease activity has been identified.

C. Service Requests:

Reports of standing water, i.e., neglected pools or mosquitoes from residents allow the Division to gauge the success of control efforts and locate new sources of mosquitoes. When requests for service are received, Vector Control Technicians visit the area, interview residents, and search for sources of mosquitoes.

3. Disease Surveillance

A. Adult mosquitoes, birds, and strategically placed flocks of chickens (sentinel chickens) are tested regularly for infections with mosquito-borne viruses. Control operations are concentrated in areas where the risk for human disease is elevated.

B. The Division works with the California Department of Public Health (CDPH), the Mosquito and Vector Control Association of California (MVCAC) and other Vector Control agencies and health departments in Ventura County and Southern California to keep

abreast of trends in arthropod-borne diseases and share information. The Division increases control and surveillance activities when elevated risk or incidence of disease is detected in its jurisdiction.

4. Determining Thresholds

Thresholds are established so that only sources which represent threats to public health or quality of life are treated. They are based on the following criteria:

- Species of mosquito present
- Stage of mosquito present
- Nuisance or disease potential
- Abundance
- Flight range
- Proximity to humans
- Size of source
- Presence/absence of natural predators
- Presence of sensitive/endangered species

Current and historic data are compared and control measures are based on whether conditions pose a risk to public health.

The Division also uses the California Department of Public Health California's Best Management Practices for Mosquito Control in California 2010 and the Mosquito-Borne Virus Surveillance and Response Plan as guides for control methods and to assess the potential for human illness and determine control strategy: They can be found at the following websites: http://www.cdph.ca.gov/HealthInfo/discond/Pages/MosquitoBorneDiseases.aspx and http://www.westnile.ca.gov/resources.php. Copies may be also requested by calling the California Department of Public Health—Vector-Borne Disease Section at (916) 552-9730 or the City of Moorpark Vector Control Division at (805) 517- 6267.

5. Selecting Control Methods

With any mosquito or other vector source, the Division's primary goal is to look for ways to eliminate the source, or, if that is not possible, for ways to reduce the vector potential. Listed below are the methods utilized by the Division. A control method is selected which is anticipated to minimize environmental impacts while maximizing efficacy. Methods of control are based on:

- Habitat type
- Water conditions and quality
- Weather conditions
- Cost
- Site accessibility
- Size and number of sites

A. Source Reduction

Source reduction includes elements such as physical control, habitat manipulation, and water management.

1. Physical Control

Mosquitoes can be controlled by physically altering their habitat, so long as the physical alteration does not affect the native landscape as it was naturally designed to function. This long-term solution reduces or eliminates sites where mosquitoes develop and ultimately reduces the need to apply pesticides.

The District usually cooperates with other agencies, e.g., Ventura County Watershed Protection District to conduct activities which can include:

- Sediment removal from flood control channels
- Repairs to existing water control structures
- Removing debris, weeds and vegetation from natural waterways
- Clear brush from margins of waterways
- Limit or rotate flow for ground water recharge

The Division makes a concerted effort to establish relationships with organizations that propose new projects such as wetland restoration so sources of vectors are not created or provisions are made to control them in the future.

2. Biological control

Fish, aquatic invertebrates, and pathogens all prey on mosquito larvae. Only mosquitofish can be reared in sufficient quantity to use as a control agent. Natural predators are rarely numerous enough to control mosquito larvae. Biological control agents are sometimes used together with bacterial or chemical insecticides.

i. Mosquitofish (*Gambusia affinis*)

Mosquitofish (*Gambusia affinis*) are used worldwide as a biological control agent for mosquitoes. They are not native to California, but are now ubiquitous in most of the State's waterways and have become an integral part of the aquatic food chain.

Mosquitofish self-propagate, have a high reproductive potential, and thrive in the shallow, vegetated waters preferred by many species of mosquitoes. They prefer to feed at the surface where mosquito larvae concentrate. These fish can be readily mass-reared or collected from sources and redistributed.

In many cases, mosquitofish are preferable to habitat modification or pesticides, particularly in altered or artificial aquatic habitats. The Division distributes them to the public for ornamental ponds and other artificial containers like water barrels and horse troughs but does not place mosquitofish into waters of the U.S.

ii. Aquatic Invertebrates

Aquatic invertebrates, including diving beetles, dragonfly and damselfly naiads, backswimmers, water bugs and hydra are natural predators of mosquito larvae. When natural predators are sufficiently abundant, additional measures to control mosquitoes, including applying pesticides may be unnecessary.

Predatory aquatic invertebrates however are often not abundant enough to control mosquito larvae, particularly in disturbed habitats. Most are general feeders and will seek other prey if it is available and more accessible. Seasonal abundance and developmental rates often lag behind mosquito populations. There are currently no suitable mass-rearing techniques or commercial sources for aquatic invertebrates.

B. Bacterial Insecticides

Bacterial insecticides contain naturally produced proteins. They are toxic to mosquito larvae when ingested in sufficient quantity. Although they are biological agents, these products are labeled and registered by the USEPA as pesticides.

1. *Bacillus thuringiensis* var. *israelensis* (*Bti*)
Product names: Vectobac® 12AS, Vectobac® G, Vectobac® TP

Bacillus thuringiensis var. *israelensis* (*Bti*) is highly target-specific and has significant effects on mosquito larvae and closely related insects, i.e., blackflies and some midges. It is available in a variety of formulations (liquid, granular, and pellet) so it can be applied by various methods and equipment. *Bti* has no measurable toxicity to vertebrates. The hazard classification on the label of *Bti* is "CAUTION". *Bti*'s insecticidal properties come from a combination of five different proteins. They have varying modes of action and act synergistically so resistance has not developed.

Mosquito larvae must ingest *Bti* for it to be effective. Pupae and late 4th stage larvae do not feed and cannot be controlled by *Bti*. Low water temperature inhibits larval feeding behavior so *Bti* is less effective in cooler weather. High organic conditions also reduce the effectiveness of *Bti*.

Bti leaves no residues, begins to degrade within 24 hours after it is applied, and is unlikely to affect water quality. There are no established standards, tolerances or USEPA-approved tests. Other strains of *Bacillus thuringiensis* occur naturally and are common in aquatic habitats.

2) *Bacillus sphaericus* (*Bs*)
Product names: Vectolex® CG, Vectolex® WDG, Vectolex® WSP

Bacillus sphaericus (*Bs*) is a bacterial pesticide with attributes similar to *Bti* but it is more effective in water with a high organic content. It may actually cycle in habitats containing high densities of mosquitoes, reducing the need for repeated applications. The hazard classification on the label of *Bs* is "CAUTION".

Bacillus sphaericus must be consumed by mosquito larvae and is therefore not effective against late 4th instar larvae or pupae. It

is also ineffective against certain mosquito species. *Bs* is toxic to mosquitoes because of a single toxin rather than the complex that is produced by *Bti*. Consequently, resistance to *Bs* has developed much more quickly.

Surveillance on the stage and species of mosquitoes present increases the effectiveness of *Bs*. Resistance can be delayed by rotating *Bs* with other pesticides.

Bacillus sphaericus occurs naturally and is environmentally safe. It leaves no residues. At the application rates used in mosquito control programs, *Bs* is unlikely to affect water quality. There are no established standards, tolerances or EPA approved tests.

3) Combined *Bacillus thuringiensis* var. *israelensis* (*Bti*) and *Bacillus sphaericus* (*Bs*) Products
Product names: Vectomax and Fourstar products

These bacterial pesticides combine both *Bacillus thuringiensis* var. *israelensis* (*Bti*) and *Bacillus sphaericus* (*Bs*) to target a wider variety of mosquito species and also varying types of water including higher organic compounds. These formulations are generally longer lasting then Bti or Bs products used alone and require less frequent applications. The hazard classification on the label these products is "CAUTION".

C. Chemical Control

1. S-Methoprene
Product Names: Altosid® briquettes, Altosid® liquid larvicide, Altosid® pellets, Altosid® SBG, Altosid® XR briquettes, Altosid® XRG

S-methoprene is a larvicide that mimics an insect growth hormone and prevents mosquitoes from becoming biting adults. It can be applied as liquid or solid or combined with *Bti* or *Bs*. S-methoprene is an effective component of an integrated management program since larvae survive as prey and remain in the food web. This material degrades quickly in sunlight and when applied as a liquid it is effective for three to five days. S-methoprene is also added into inert, charcoal-based carriers such as pellets and briquettes so it can be time-released for up to 150 days. Different formulations provide options for treatment in a wide range of environmental conditions. S-methoprene is not toxic to vertebrates and most invertebrates when exposed at concentrations used by mosquito control.

S-methoprene is only effective against mosquito larvae. Monitoring its effectiveness is difficult since larvae do not die. S-methoprene is more expensive than most larvicides.

Surveillance and monitoring provides information on stages of mosquitoes present, timing of applications, and efficacy of treatments. S-methoprene does not have a significant impact on water quality. It is rapidly degraded in the environment and is not known to have persistent or toxic breakdown products. The hazard classification on the label of s-methoprene is "CAUTION". It is applied at levels far below those that can be detected by any currently available test. S-methoprene has been approved by the World Health Organization for use in drinking water containers.

2. Surfactants

Product Names: GB-1111, Agnique® MMF

Surfactants are either petroleum (GB-1111) or alcohol (Agnique®)-based materials that form a thin layer on the surface of water. They kill surface-breathing insects by mechanically blocking their respiratory mechanism.

Surfactants are the only materials that kill mosquito pupae. Agnique® MMF forms an invisible monomolecular film. The material spreads across the water surface and into inaccessible areas. GB-1111 is a refined petroleum product that forms a visible film on the water. It is normally evaporates in 24-48 hours. The hazard classification on the label of GB-1111 and AGNIQUE® MMF is "CAUTION". AGNIQUE® MMF is labeled "safe for use" in drinking water.

The action of surfactants is indiscriminate. Surface-breathing natural predators of mosquitoes may be affected. In general, surfactants are used only after other control strategies have been ruled out.

D. Cultural Practices

Stormwater BMP and wetland design/maintenance criteria have been developed and adopted by City of Moorpark staff using BMP guidelines developed by the CDPH and other agencies. These criteria are shared with various governmental agencies and private parties involved in the planning process for projects having the potential to create mosquito breeding problems. Guidelines for the following source types are included and are considered cultural control techniques:

* Drainage construction and maintenance practices
* Dredge material disposal sites
* Irrigated pastures
* Permanent ponds used as waterfowl habitat
* Permanent water impoundments
* Marshes
* Sedimentation ponds and retention basins
* Utility construction practices
* Above and below ground stormwater treatment practices

The Division also provides literature and educates homeowners and contractors about eliminating sources that produce mosquitoes from residential property. These sources include rain gutters, artificial containers, ornamental ponds, abandoned swimming pools, tree holes, septic tanks, and other impounded waters.

1. Water Management

Water Management consists of techniques to control the timing, quantity, and flow of water in managed wetlands to control populations of mosquitoes. The Division has established guidelines for water management based on information from the University of California Agricultural Extension Service (UCAES). The District provides these guidelines to property owners to promote proper irrigation techniques for wetlands to reduce mosquito populations.

2 Vegetation Management

Removing vegetation helps water circulate and increases access for natural predators; both help reduce mosquito breeding. Vegetation management is achieved almost entirely through cooperative efforts of property owners. Vector Control Technicians rarely use hand tools.

Vegetation protects mosquito larvae and adults from predators, wind, and wave action. Managing vegetation enhances the effects of these factors and reduces the need for pesticides. Several factors can limit vegetation management including: sensitivity of the habitat, presence of special status species, seasonality, size of the site, density and type of vegetation, species of mosquito, and weather.

6. TRAINING AND CERTIFICATION

The CDPH Vector-Borne Disease Section certifies, tests, and trains all staff

who either apply pesticides or oversee the application of pesticides. The MVCAC provides training materials and examinations are conducted by the CDPH.

Certified staff must obtain continuing education units (CEUs) in Laws and Regulations (12 units) and Mosquito Biology (8 units) every two years. Eight units each in Terrestrial Invertebrate and Vertebrate Control are optional each two-year cycle.

The MVCAC provides opportunities to earn CEUs. Training programs are approved by the CDPH. The Division conducts continuous in-house educational and safety programs.

Members of the MVCAC operate under the California Health and Safety Code and the California Government Code (Division 1, Administration of Public Health, Chapter 2, Powers and Duties; also Part 2, Local Administration, Chapter 8, State Aid for Local Health Administration; Division 3, Pest Abatement, Chapter 5, Mosquito Abatement Districts or Vector Control Districts, Sections 2000 - 2910). Members of the MVCAC that are signatories to the California Department of Public Health Cooperative Agreement pursuant to Section 116180, Health and Safety Code) are required to comply with the following:

1) Calibrate all application equipment using acceptable techniques before using, and to maintain calibration records for review by the County Agricultural Commissioner.

2) Calibrate at least annually all equipment used by the Division.

3) Maintain copies of calibration records at the Division.

4) Maintain for at least two years for review by the County Agricultural Commissioner a record of each pesticide application showing the target vector, the specific location treated, the size of the source, the formulations and amount of pesticide used, the method and equipment used, the type of habitat treated, the date of the application, and the name of the applicator(s).

5) Submit to the County Agricultural Commissioner each month a Pesticide Use Report on Department of Pesticide Regulation form PR-ENF-010. The report shall include the manufacturer and product name, the registration number from the label, the amount of each pesticide, the number of applications of each pesticide, and the total number of applications, per county, per month.

6) Report to the County Agricultural Commissioner and the Department of

Health Services any conspicuous or suspected adverse effects from applications of pesticides on humans, domestic animals and other non-target organisms, or property.

7) Require employees to be properly certified by the CDPH to apply pesticides to control vectors, and maintain records that document certified employees receive a minimum of 20 hours of continuing education hours every two years.

8) Receive regular inspections by the County Agricultural Commissioner to ensure compliance with state laws and regulations relating to pesticide use.

9) A website where public notices, required in Section VIII.B, may be found at : http://www.ci.moorpark.ca.us

The Division also complies with the requirements of other agencies, e.g., local fire departments, California Department of Fish and Game, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and others who have jurisdiction and oversight over its activities. The Division works closely with these agencies to comply with their requirements.

Monitoring Plan for the City of Moorpark Vector Control Division

Introduction

The Division is within the jurisdiction of the Region 4 Water Quality Control Board (RWQCB) and is seeking coverage under the General Permit for discharges of aquatic pesticides to waters of the U.S.

This monitoring plan consists of ongoing best management practices (BMPs), record-keeping, and reporting. Records shall be kept of all pesticide applications made to waters of the U.S. by Division staff and/or contractors. These records shall include the site, material, concentration, quantity applied, habitat type, approximate water surface area, and the date and time for each application. The Division shall report annually to the RWQCB on its aquatic pesticide applications, summarizing the recorded data to indicate the quantity of each pesticide active ingredient applied to each habitat type within the zone of the Division that drains to each major final receiving body. If any non-standard larvicides or herbicides are required, the RWQCB will be promptly notified so a supplemental monitoring plan can be developed.

The State Water Resources Control Board (SWRCB)'s General Permit provides that monitoring exemptions may be appropriate for vector control projects involving microbial larvicides, thin film larvicides and methoprene. The Division is a current member of the Mosquito and Vector Association of California (MVCAC) in which all member agencies participate in a monitoring program approved for monitoring all mosquito control larvicides. This document is in development and will be available when completed at http://www.mvcac.org. Copies may be also requested by calling the Division (805) 517-6267.

In order to ensure that the most environmentally sensitive methods are being employed the Division will annually review its BMPs to incorporate new practices and less toxic methods and materials as they become available. Changes or revisions to BMPs will be reported annually.

Types of Sources Treated

The Division's main effort at controlling mosquito larvae allows it to localize treatments and use the least toxic alternatives. Adult mosquitoes may occasionally be targeted for control. However, since pesticides must be applied over a greater area and are less selective the Division avoids using them whenever possible.

There are 13 species of mosquitoes that can potentially be found within Moorpark's limits, (Table 1) that are distributed variably and develop in several types of sources. Mosquitoes generally cannot survive in water that flows substantially or has a disturbed surface. Species are distributed based on their tolerance to salinity, degree of organic pollution, and temperature.

Climate and Seasonality

Most of the precipitation in Ventura County falls from November through May, and summer temperatures can exceed 100°F. The weather and seasonal patterns of rainfall and temperature influence how mosquitoes are distributed and thus how and when pesticides are applied. For example, waterways that flow during winter are usually treated in summer after the flow has receded. Similarly, mosquitoes are generally flushed out of storm drains during winter so these sources are typically treated only during the summer months.

Aquatic Pesticides and Assessment of Potential Impacts

The Division uses aquatic pesticides which fall into the three categories: bacterial, chemical, and surfactants. Table 2 summarizes the amount of these products applied annually by the Division.

A. Bacterial Larvicides

Bacterial larvicides contain proteins within spores of bacteriae that are toxic to mosquito larvae when ingested in sufficient quantities. These products are labeled and registered by the USEPA as pesticides and are considered chemical control agents despite originating from natural sources.

1. *Bacillus thuringiensis* var. *israelensis* (*Bti*)

Advantages: *Bti* is highly target-specific and significantly affects larvae of mosquitoes and closely related insects such as blackflies and midges. It is available in a variety of formulations (liquid, granular, and pellet) so it can be applied by a variety of methods and equipment. *Bti* has no measurable toxicity to vertebrates and is classified by USEPA as "Practically Non-Toxic". *Bti* formulations contain a combination of five different proteins within a larger crystal. These proteins have varying modes of action and act synergistically so the likelihood is remote that mosquito populations will become resistant.

Disadvantages: Bacterial larvicides must be ingested in sufficient quantities to be effective. Pupae and late 4th stage larvae do not feed and cannot be controlled by *Bti*. Low water temperature inhibits larval feeding behavior, reducing the effectiveness of *Bti* during cooler months. Water with high concentrations of organic material reduces the effectiveness of *Bti*.

Solutions to Disadvantages: Increasing the frequency of surveillance for larvae can ensure that bacterial insecticides are applied during the appropriate stages of development.

Impact on water quality: *Bti* is generally regarded as environmentally safe. Strains of *Bacillus thuringiensis* occur naturally in aquatic habitats. *Bti* leaves no residues and degrades quickly. At the application rates used in mosquito control programs; this product is unlikely to have any measurable effect on water quality. There are no established standards, tolerances or USEPA approved tests for *Bti*.

Product names: Acrobe®, Bactimos® pellets, Teknar® HP-ID, Vectobac® 12AS, Vectobac® G, Vectobac® TP.

Formulations and dosages There are five basic *Bti* formulations available: liquids, powders, granules, pellets, and briquettes. Liquids are produced from a concentrate with a particle size of 2-10 microns which are suitable for mosquito larvae to ingest.

The particle size of powders is not always uniform. Clumping can cause particles to settle and prevent larvae from ingesting the material. Powders must be mixed with water before they are applied. *Bti* granules, pellets, and briquettes are formulated from *Bti* primary powders and an inert carrier. The hazard classification on the label of *Bti* is "CAUTION".

Bti is applied by the Division as a liquid or sometimes bonded to an inert substrate, e.g., corn cob granules, to assist penetrating vegetation. *Bti* can be applied by hand, all terrain vehicle (ATV), or aircraft and persists in the environment for three to five days. Mosquitoes are usually killed within 48 hours after they ingest *Bti*.

Currently three commercial brands of *Bti* liquids are available: Aquabac® XT, Teknar® HP-D, and Vectobac® 12AS. Labels for all three products recommend using 4 to 16 fl oz/Acre in unpolluted, low organic water with low populations of early instar. The Aquabac® XT and Vectobac® 12 AS labels also recommend increasing the rate from 16 to 32 fl oz/A when late 3rd or early 4th instar larvae predominate, larval populations are high, water is heavily polluted, and/or algae are abundant. The recommendation to increase dosages in these instances also is seen in various combinations on the labels for all other *Bti* formulations discussed below.

Bti liquid may also be combined with s-methoprene liquid which allows the Division to use less of each product.

There are currently two popular corncob granule sizes used in commercial formulations. Aquabac® 200 G, Bactimos® G, and Vectobac® G are made with 5/8 grit crushed cob, whereas Aquabac® 200 CG (Custom Granules) and Vectobac® CG are made with 10/14 grit cob. Aquabac® 200 CG is available by special request. The 5/8 grit is much larger and contains fewer

granules per pound. The current labels on *Bti* granules recommend using 2.5 to 10 lb./acre in "cleaner" water and 10 to 20 lb./acre in "organic" or polluted waters.

2. ***Bacillus sphaericus* (*Bs*)**

Advantages: *Bacillus sphaericus* (*Bs*) is a bacterial pesticide with attributes similar to those of *Bti*. The efficacy of this bacterium is not affected by organic pollution in water. It may establish a natural cycle in habitats with high density of mosquitoes so fewer applications are needed.

Disadvantages: *Bs* must be consumed and is not effective against late 4th instar larvae or pupae. *Bs* is also ineffective against species of mosquitoes that develop in salt marshes, seasonal forest pools, or tree holes. *Bs* is toxic to mosquitoes because of a single toxin rather than a complex as with *Bti*. This more simplistic mechanism makes it easier for mosquitoes to develop resistance, which has been reported in Brazil, Thailand and France where *Bs* was used as the sole control method for extended periods of time.

Solutions to Disadvantages: Information obtained from larval surveillance can help limit its use to sources with susceptible mosquitoes. The development of resistance can be delayed by rotating *Bs* with other larvicides.

Impact on water quality: At the application rates used in mosquito control programs, *Bs* is unlikely to have any measurable effect on water quality. It is a naturally occurring bacterium that is present in most aquatic environments. There are no established standards, tolerances or EPA approved tests for *Bs*.

Product names: Vectolex® CG, Vectolex® WDG

Formulations and dosages Vectolex® CG contains 50 BSITU/mg *(Bacillus sphaericus* International Toxic Units/mg) on a 10/14 mesh ground corn cob carrier. The hazard classification on the label of Vectolex® CG is "CAUTION". It is intended for use in polluted or highly organic source of mosquito larvae such as dairy waste lagoons, sewage lagoons, septic ditches, tires, and storm sewer catch basins. Vectolex®-CG is designed to be applied by hand or truck-mounted blower or aerially at 5-10 lb/acre to control 1st to 3rd instar larvae.

3. Combined Formulations *Bacillus sphaericus* (*Bs*) and *Bacillus thuringiensis* var. *israelensis* (*Bti*)

Advantages: *Bti* and *Bs* mixtures are highly target-specific and significantly affects larvae of mosquitoes and closely related insects such as blackflies and midges. It is available in a variety of formulations (liquid, granular, and pellet) so it can be applied by a variety of methods and equipment. *Bti/Bs* has no measurable toxicity to vertebrates and is classified by USEPA as "Practically Non-Toxic". *Bti/Bs* formulations contain numerous combinations of different proteins within a larger crystals. These proteins have varying modes of action and act synergistically so the likelihood is remote that mosquito populations will become resistant.

Disadvantages: Bacterial larvicides must be ingested in sufficient quantities to be effective. Pupae and late 4th stage larvae do not feed and cannot be controlled by *Bti/Bs*. Low water temperature inhibits larval feeding behavior, reducing the effectiveness of *Bti/Bs* during cooler months.

Impact on water quality: At the application rates used in mosquito control programs, *Bti/Bs* is unlikely to have any measurable effect on water quality. It is a naturally occurring bacterium that is present in most aquatic environments. There are no established standards, tolerances or EPA approved tests for *Bti/Bs*.

Product names: Vectomax® G, Vectomax® CG, Vectomax® WSP

Formulations and dosages Vectomax® G, Vectomax® CG and Vectomax® WSP all contain 2.7% *Bacillus sphaericus* and 4.5% *Bacillus thuringiensis*. The hazard classification on the label of all Vectomax formulations is "CAUTION". It is intended for use in a wide variety of mosquito larvae habitats including those that contain fish, other aquatic life and plants, birds, mammals and other wildlife.

B. Chemical Pesticides

S-Methoprene

Advantages: S-methoprene is a larvicide that mimics a growth regulator of insects. It can be applied as a liquid or solid or combined with *Bti* or *Bs*. S-methoprene is effective in integrated vector management strategies since larvae remain available as prey. It breaks down quickly in sunlight and in a liquid formulation is effective for only 24 hours. S-methoprene can be impregnated into charcoal-based carriers such as pellets and briquettes for longer residual activity ranging from 30 to 150 days. The different

formulations provide options for treatment under a wide range of environmental conditions. S-methoprene is nontoxic to all vertebrates and most invertebrates at concentrations used to control mosquitoes.

Disadvantages: S-methoprene is effective against mosquito larvae. Monitoring for effectiveness is difficult since mortality is delayed. S-methoprene is more expensive than most other larvicides and cannot control mosquito pupae.

Solutions to Disadvantages: Surveillance and monitoring can determine which stage of mosquito larvae are present so that applications can be timed to maximize their efficacy.

Impact on Water Quality: S-methoprene does not significantly impact water quality. It is effective against mosquitoes at levels that cannot be detected by any currently available test. Studies on non-target organisms have shown that methoprene is non-toxic to all vertebrates and most invertebrates when exposed to concentrations used to control mosquitoes.

Product Names: Altosid® Liquid Larvicide, Altosid® Single Brood Granule, Altosid® Pellets, Altosid® Briquettes, Altosid® XR Extended Release Briquettes

Formulations and dosages: S-methoprene has a half-life of about 48 hours in water and plants and ten days in soil. Various formulations maintain an effective level of active material (0.5-3.0 parts per billion) in the mosquito habitat which minimizes the cost and impact of repeated applications. Currently, five formulations of s-methoprene are sold under the trade name of Altosid®: Altosid® Liquid Larvicide (ALL) and Altosid® Liquid Larvicide Concentrate, Altosid® Briquettes, Altosid® XR Briquettes, and Altosid® Pellets. The hazard classification on the label of s-methoprene is "CAUTION".

Altosid® Liquid Larvicide (ALL) & ALL Concentrate are microencapsulated liquid formulations that differ in their concentrations of active ingredients (AI). ALL contains 5% s-methoprene; ALL Concentrate contains 20% s-methoprene. Inert ingredients encapsulate the s-methoprene which allows it to be released slowly and prevents it from being degraded by ultraviolet light.

The maximum rate that can be applied is 0.0125 lb. AI (4 fl oz ALL and 1 fl oz ALL Concentrate per A mixed in water and dispensed by spraying with conventional ground and aerial equipment). In sites with a mean depth of one foot, this is equivalent to a maximum concentration of 4.8 ppb. The actual concentration is substantially lower because the encapsulation does not allow the active ingredient to disperse instantly into the water.

Cold, cloudy weather and cool water slow the release and degradation of the active ingredient as well as the development of the mosquito larvae.

Altosid® Briquettes contain 4.125% s-methoprene (0.000458 lb. AI/briquette, 4.125% (wt/wt)), plaster (calcium sulfate), and charcoal. Briquettes release s-methoprene for about 30 days under normal weather conditions. The recommended application rate is 1 briquette per 100 sq ft in non-flowing or low-flowing water up to 2 feet deep. Typical treatment sites may include storm drains, catch basins, ornamental ponds and fountains, waste treatment and settlement ponds, transformer vaults, abandoned swimming pools, and construction and other man-made depressions.

Altosid® XR Briquettes consist of 2.1% (wt/wt) s-methoprene (0.00145 lb AI/briquette) embedded in hard dental plaster (calcium sulfate) and charcoal. XR Briquettes contain three times more AI as the "30-day briquette". The harder plaster and larger size allow sustained release for up to 150 days in normal weather. The recommended application rate is 1 to 2 briquettes per 200 sq. ft. in no- or low-flow water conditions, depending on the target species. Many applications are similar to those with the smaller briquettes, although the longer duration s-methoprene is released makes this formulation economical in sources like small swamps and marshes and beds of aquatic vegetation.

Altosid® Pellets contain 4.25% (wt/wt) s-methoprene (0.04 lb. AI/lb.), dental plaster (calcium sulfate), and charcoal in a small, hard pellet. They slowly release s-methoprene as they erode. In normal weather, this can occur for up to 30 days of being constantly submerged. Application rates range from 2.5 lbs to 10.0 lbs per A (0.1 to 0.4 lb. AI/A), depending on the target species and/or habitat. At maximum rates, the slow release of material means that the concentration of active ingredient in the water at one point never exceeds a few parts per billion.

The target species are the same as those listed for the briquette and liquid formulations. Target sites include pastures, meadows, rice fields, freshwater swamps and marshes, salt and tidal marshes, woodland pools, flood plains, tires and other artificial water holding containers, waste treatment ponds, ditches, and other man-made depressions, ornamental pond and fountains, flooded crypts, transformer vaults, abandoned swimming pools, construction and other man-made depressions, tree holes, storm drains, catch basins, and waste water treatment settling ponds.

Altosid® XR-G Granules contain 1.5% (wt/wt) s-methoprene. They are designed to slowly release s-methoprene as they erode. In normal weather, control lasts up to 21 days. Label application rates range from 5

to 20 lbs per A, depending on the target species and/or habitat. The species are the same as listed for the briquette formulations. Listed target sites include meadows, rice fields, freshwater swamps and marshes, salt and tidal marshes, woodland pools, tires and other artificial water holding containers, waste treatment ponds, ditches, and other natural and man-made depressions.

C. Surfactants

Surfactants are either petroleum (GB-1111) or alcohol (Agnique® MMF) based and form a thin layer on the water surface that kills mosquito larvae by suffocating them.

Advantages: These are the only materials that kill mosquito pupae. Agnique® forms a monomolecular film that is not visible. The spreading action of the surfactant across the water surface can carry it to inaccessible areas. Agnique® is labeled "safe for use" in drinking water.

Disadvantages to Use: Surfactants are indiscriminate, and may also affect aquatic predators of mosquitoes if they are present. GB-1111 forms a visible film on the water surface.

Solutions to Disadvantages: Surfactants are used when mosquito pupae are present and when there is no other alternative available.

Product Names: GB-1111, Agnique® MMF

Formulations and dosages

GB-1111 is highly refined oil that evaporates with 24-48 hours. This material is classified with a rating of 1 (slight) for flammability and health risk under National Fire Protection Association (NFPA) and 0 (none) for reactivity. The hazard classification on the label of GB-1111 is "CAUTION". It contains 99% (wt/wt) oil and 1% (wt/wt) inert ingredients. The dosage rate is 3 gallons per acre or less for clean water. Up to 5 gallons per acre may be used when treating areas with high organic content.

GB-1111 provides effective control on a wide range of mosquito species. It is typically applied by hand, ATV, or truck. Aerial application is possible but not routinely done.

Agnique® MMF is the trade name for a surface film larvicide made of ethoxylated alcohol. The hazard classification on the label of Agnique® MMF is "CAUTION". According to the label, Agnique® MMF has very low vertebrate toxicity; an average persistence in the environment of 5-14 days at label application rates; and no toxic breakdown products, skin irritation,

carcinogenicity, mutagenicity, or teratogenicity has been reported. Because of its similar mode of action and effectiveness against pupae, Agnique® can be used as an alternative to GB-1111, especially where the temporary sheen associated with GB-1111 might be objectionable.

Assessment of Existing or Potential Impact of Pesticides Used by the Division

Mosquito control is perpetual since the goal is to manage, not eradicate mosquito populations. Sources of larvae are inspected continuously and treatments are applied as necessary to maintain public health. The materials used by the Division to control mosquitoes are applied at extremely low dosages and are not known to have measurable impacts on water quality. The existing water quality however influences what materials are used and how effective they are.

Physical control (manipulation of drainage, flow etc.) enhances water circulation which directly reduces mosquito populations while improving habitat for natural predators of mosquito larvae. Limiting the time water stands makes it impossible for mosquito larvae to develop into adults.

The BMPs used by the Division to control mosquitoes attempt to eliminate the impacts to water quality which NPDES permits monitor. These include:

Dissolved oxygen: Materials used in mosquito control are applied at volumes of several ounces (s-methoprene) to less than 10 gallons (surfactants) of active ingredient per acre. Measurable effects on dissolved oxygen at these dosage rates are extremely unlikely.

Temperature: Materials used in mosquito control are generally applied at or near ambient temperature; any affect on water temperature is unlikely.

pH: Materials used to control mosquito larvae are neither strongly acidic or basic. Measurable effects on pH are unlikely.

Turbidity: Existing turbidity at a source of mosquitoes may influence which materials are selected and how effective they are. At the application rates used in our programs, measurable effects on turbidity are unlikely.

Hardness: Materials used in mosquito control do not have a high mineral content. At the dosage rates used in mosquito control measurable effects on water hardness are unlikely.

Electrical conductivity: Materials used in mosquito control do not have high concentrations of chlorides or other ions. At the dosage rates used in mosquito control measurable effects on conductivity are unlikely.

Pesticide residues: Materials used by Division degrade quickly in the

environment. Slow-release formulations of s-methoprene are specifically designed to be released in small amounts of active ingredient over time, and *Bacillus sphaericus* may establish natural cycles under favorable conditions. There are currently no USEPA-approved laboratories or protocols for detecting residues of larvicides that the Division uses. Monitoring populations of mosquito larvae (which is one of the Divisions BMPs) is the most sensitive method for determining whether residual larvicides are present.

Evaluation of the Moorpark Vector Control Divisions Best Management Practices (BMPs)

Pesticides are only one of the Division's BMPs that incorporate physical and biological means to control and continuously monitor mosquito populations. Each BMP is summarized below.

Physical Control and Water Management

Cost: High. Requires specialized equipment and expertise, and is labor intensive.

Disadvantages: High cost; potentially disturbing habitats of endangered species; potentially disturbing regulated wetlands; extensive permitting process.

Solutions to Disadvantages: Require landowners to monitor and maintain property to prevent mosquitoes from breeding.

Relative usefulness: Used whenever possible because it is a permanent solution. Biological or chemical control is used if physical control is not feasible or while working toward a solution based on physical control.

Biological Control

Mosquito fish

Cost: Low

Disadvantages: Non-native fish may compete with native species in natural sources

Solutions to Disadvantages: Use only where impact to native species is minimal

Relative usefulness: Can be effective in specific conditions, i.e., if a source is suitable and physical or chemical control is not feasible or applicable

Bacterial pesticides

Bacillus sphaericus* and *B. thuringiensis* var. *israelensis

Cost: More expensive than traditional chemical pesticides but less costly than physical control.

Disadvantages: Requires careful monitoring of mosquito populations and knowledge of their ecology. Not effective against some species or some stages or in some sources. Short duration of control; requires frequent re-treatments. Relying on a single product may cause mosquitoes to become resistant.

Solutions to Disadvantages: Surveillance of mosquitoes; appropriate training for District staff; rotating products, investigating new materials

Relative usefulness: These agents are considered when physical control is not acceptable and fish cannot be stocked or maintained. These agents can be used together with fish.

Chemical Control using s-methoprene and surfactants

Cost: Less costly in the short term than physical control

Disadvantages: Requires careful monitoring of mosquito populations and knowledge of their ecology. Not effective against some species or some stages or in some sources. Short duration of control; requires frequent re-treatments. Relying solely on s-methoprene may cause mosquitoes to become resistant.

Solutions to Disadvantages: Surveillance of mosquitoes, appropriate training for District staff, rotating products, investigating new materials

Relative usefulness: These materials are considered when physical control is unacceptable and fish cannot be stocked or maintained. S-methoprene and Agnique® can each be used with fish. Decisions on whether to use these materials or bacterial pesticides are based on stage and species of mosquitoes present, quality of water, and access.

Training and Certification

Section 116180 of the California Health and Safety Code allows CDPH to "enter into a cooperative agreement with any local district or other public agency engaged in the work of controlling mosquitoes, gnats, flies, other insects, rodents, or other vectors and pests of public health importance, in areas and under terms, conditions

and specifications as the director may prescribe."

The DIVISION annually renews its cooperative agreement with CDPH. The Division agrees to:

1) Calibrate all application equipment using acceptable techniques before using, and to maintain calibration records for review by the County Agricultural Commissioner.

2) Calibrate at least annually all equipment used by the Division.

3) Maintain copies of calibration records at the Division.

4) Maintain for at least two years for review by the County Agricultural Commissioner a record of each pesticide application showing the target vector, the specific location treated, the size of the source, the formulations and amount of pesticide used, the method and equipment used, the type of habitat treated, the date of the application, and the name of the applicator(s).

5) Submit to the County Agricultural Commissioner each month a Pesticide Use Report on Department of Pesticide Regulation form PR-ENF-010. The report shall include the manufacturer and product name, the registration number from the label, the amount of each pesticide, the number of applications of each pesticide, and the total number of applications, per county, per month.

6) Report to the County Agricultural Commissioner and the Department of Health Services any conspicuous or suspected adverse effects upon humans, domestic animals and other non-target organisms, or property from pesticide applications.

7) Require employees to be properly certified by the CDPH to apply pesticides to control vectors, and maintain records that document certified employees receive a minimum of 20 hours of continuing education hours every two years.

8) Receive regular inspections by the County Agricultural Commissioner to ensure compliance with state laws and regulations relating to pesticide use.

TABLE 1. Species of mosquitoes found in Ventura County and potentially in the City of Moorpark

Aedes melanimon
Aedes sierrensis

Anopheles franciscanus
Anopheles hermsi

Culex erythrothorax
Culex pipiens quinquefasciatus
Culex restuans
Culex stigmatosoma
Culex tarsalis
Culex thriambus

Culiseta incidens
Culiseta inornata
Culiseta particeps

TABLE 2. Annual aquatic pesticide usage by the DIVISION 2000-2010

The amount of each product used is determined by following the application directions on each product's label. All Division vehicles carry notebooks containing all product labels and labels are also placed on application equipment such as sprayers. The size of the area to be treated, along with factors such as organic levels, determines the amount of product used. Listed on the table below are the total amounts (in ounces) of all mosquito larvicides the district has used over the past ten years.

Pesticide	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Altosid Liquid Larvicide(oz.)	0	0	0	0	4.15	0	4.5	0	0	0	0
Altosid Pellets (oz.)	0	0	0	0	0	16.5	285.95	723.9	965.1	781.49	960.75
Altosid Briquets (oz.)	24.25	35.21	32.82	22.51	92.11	52.3	0	0	0	4	0
Agnique (oz.)	5.91	89.11	96.92	76.96	177.65	31.59	26.7	6.76	39.33	8.76	18.8
GB-1111 (oz.)	2861.3	1661.05	1105.5	987.34	1003.5	1163.5	1307.5	1012.5	1186.1	432.1	568.9
Vectobac 12AS (oz.)	0	30	0	0	10	0	3	0	0	0	0
Vectobac G (oz.)	1362.1	885.3	106	483.4	4122.1	507.3	231.5	94	306.5	106	297.5
Vectolex CG (oz.)	154	0	0	996.25	1216.6	329.2	11	94	288.7	0	44.8

CITY OF MOORPARK MOSQUITO SOURCES

Arroyo Simi/VDA

#	Source	Description
A1	A.S. #1 Section 1	East city limits to VDA stabilizing weir.
A2	No. 2 Cyn. FCC (Formerly Moorpark College FCC #2)	Between 118 and VDA by railroad tracks

Villa Del Arroyo #1

#	Source	Description
B2	VDA Entrance Gate Pond/Seepage	South Drain- South side of Spring/Tierra Rejada intersection. Southeast of flood control entrance gate, down in ravine.
B5	VDA Run Off Drain 1 -	In VDA Complex.Branch of Underground Drain by Unit # 160
B6	VDA Run Off Drain 2 -	In VDA Complex.Branch of Underground Drain by Unit # 61
B7	VDA Run Off Drain 3 -	In VDA Complex.Branch of Underground Drain by Unit #217
B8	VDA Run Off Drain 4 -	In VDA Complex.Branch of Underground Drain by Unit #
E1	VDA Clubhouse Pond-	Directly South of VDA Clubhouse. Check After heavy rains

Villa Del Arroyo #2

#	Source	Description
D1	VDA Drain A -	The farthest East drain that runs S.of the concrete levee/walkway. N.W. of pond D.
D2	VDA Drain B -	About 300 ft. W. of Drain A.
D4	VDA Drain D -	About 500 ft. W of Drain C.
D7	VDA Stabilizer Pond -	Pond north of VDA Pond C, and east of stabilizer on Arroyo. West of VDA park
D8	VDA Stabilizer Pond West-	Pond about 50 feet West of VDA stabilizer pond.

Moorpark College Area

#	Source	Description
G1	Pecan Ave. Gutter-	
G3	Strathearn Canyon FCC (Formerly Pecan Ave FCC)-	Enter through flood gate on west side of Pecan and go south to Arroyo
G7	Happy Camp Canyon FCC (formerly Fordham FCC)	SouthWest of College Heights/Westwood intersection
G8	Hwy 118 North Drainage -	North of 118 and south parking lot of Varsity Park Village, between Penn and Marquette

Arroyo Simi/Condor

#	Source	Description
H1	AS Sec.#2 Section 2	From VDA stabilizing weir to Butler crossing.
H2	Hwy 118 South Drainage -	South of 118, between Teledyne Laars and Collins.

Virginia Colony/Spring

#	Source	Description
i1	AS Sec#3 Section 3	Butler crossing to Virginia Colony trestle
i2	Vulcan Concrete formerly Ready Mix Pond -	On west side of yard at 13950 East LA Ave
i3	AS Sec#4 Section 4	Virginia Colony trestle to Ready Mix trestle
i4	Castro-Williams FCC(formerly Calmat FCC)	Channel between Calmat and Riddle property

Arroyo Simi East of Spring

#	Source	Description
J1	AS Section 5	Ready Mix trestle to New LA Ave
J2	AS Section 6	New LA Ave to Spring St bridge
J3	Carlsberg Retention Basin -	South of Arroyo Simi, Section 6, and east of Spring

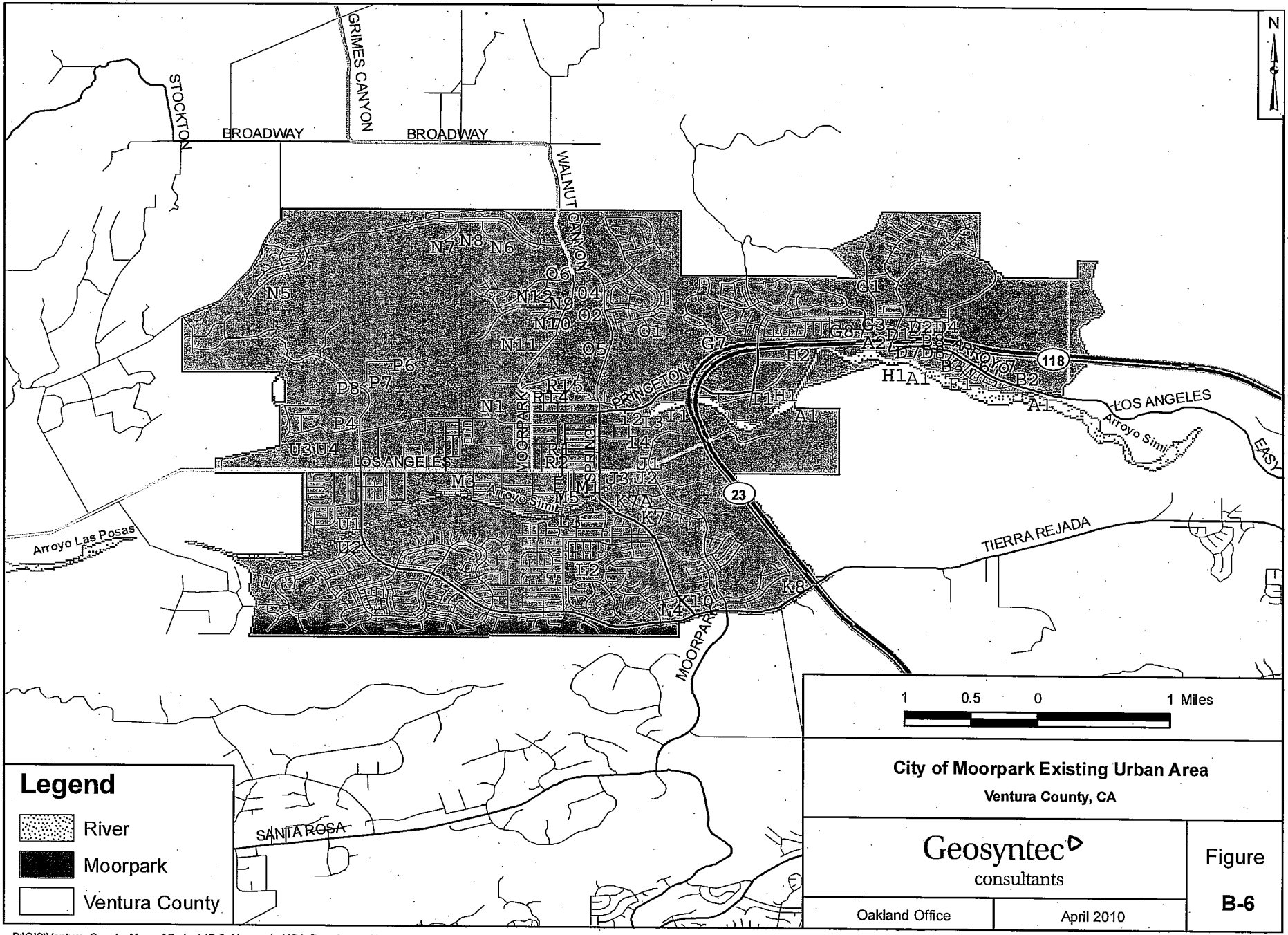
Carlsberg Area

#	Source	Description
K7	Stagecoach/Spring Retention Basin	Located down in canyon between Stagecoach & Spring
K7A	Stagecoach/Spring Basin Drainage	Drainage to the North of above basin.
K8	Shawnee/Crabapple Ret. Basin	Located on both East and West on the South side Crabapple Ct.
K10	Shawnee Ct. West Ret. Basin #2	Located on West side of Shawnee Ct. South Basin

Peach Hill

#	Source	Description

L2	Peach Hill Drain	(Formerly Marlborough drain) - South of Quail Summit and west of Mill Valley
L3	Performance Nursery -	Check drainage running north to south, and also along AS Sec 7&8
L4	Spring St. S. Pond-	Pond located W. of Spring St. S.of Tierra Rejada and N. of Christian Barrett
Arroyo Simi West of Spring		
#	**Source**	**Description**
M1	AS Section 7	Spring St bridge to AV Pedestrian Bridge
M3	AS Section 8	AV Pedestrian Bridge to Tierra Rejada Bridge
M5	Ret. Pond # 1 AS Section 7	
Between Grimes & Walnut Canyon		
#	**Source**	**Description**
N1	Walnut Canyon FCC -	200 yards west of Walnut Canyon, starts at Championship Dr. and goes 3 miles until it meets Gabbert FCC, West of the Edison Station on LA Ave.
N5	Trevino Dr. Ret Basin	East of Trevino Dr. and West of Golf Course Ridgeline 7th
N6	Moorpark C.C. Canyon Crest Golfcourse	Canyon Crest Course Holes 1-9 and Drainage Channels. East Course
N7	Moorpark C.C. Ridgeline Golf course Hole 1 Seepage	Ridgeline Course Holes 1-9 and Drainage Channels. West Course
N8	Moorpark C.C. Creekside Golfcourse	Ridgeline Course Holes 6-9 and Drainage Channels. Middle Course
N9	N Meridian Hills/Walnut Cyn Ret. Basin	Meridian Hills tract entrance West side of Walnut Cyn. N. Side
N10	S Meridian Hills/Walnut Cyn Ret. Basin	Meridian Hills tract entrance W side of Walnut Cyn. S. Side #5187
N11	Casey/Walnut Cyn Ret. Basin & Drainage	Start S of Meridian Hills at Concrete stairs leading to drainage that flows towards Casey Rd.
N12	Breezy Glen Ret. Basin	N.W. Corner of Meridian Hills & Breezy Glen
Walnut Canyon East		
O1	Timber Hollow Ret. Basin	Moorpark Highlands tract. Ret Basin S. side of Timber Hollow
O2	Mpk Highlands Spring/Elk Run Loop Ret. Basin 1	West Side of Spring First Ret. Basin North of Elk Run Loop
O4	Mpk Highlands Spring/Elk Run Loop Ret. Basin 2	West Side of Spring Second Ret. Basin North of Elk Run Loop
O5	Mpk Highlands W. Spring N Charles Ret. Basin	West Side of Spring Ret. Basin North of Charles St
O6	Walnut Cyn./Spring S. Ret. Basin	S.E. corner of intersecttion of Spring and Walnut Cyn.
Gabbert Road Area		
#	**Source**	**Description**
P4	Gabbert Rd FCC -	Continuation of Walnut Canyon FCC; starts on west side of Gabbert and flows southwest to Arroyo Simi
P6	Elwin St Drain -	at 22837 Elwin St
P7	Darlene Ln Gutters -	street gutters
P8	Darlene/ Gabbert St. Drain/Channel	Channel & Drain on both sides of Darlene & Gabbert Intersection that keeps flowing Soth along the East side of Gabbert.
Downtown		
#	**Source**	**Description**
R1	Third St. Gutters	
R2	Flory St Gutters	
R14	High St Theater back drain	Sump Pump Drain Behind 45 High St. Theater
R15	Charles St. Gutter	
Mountain Meadows North		
#	**Source**	**Description**
	No active sources in this area.	
Arroyo Simi West of Tierra Rejada		
#	**Source**	**Description**
U1	AS Section 9	Tierra Rejada bridge to Gabbert drain
U2	Mtn.Meadows/A.S. Sec.#9 Drain-	Drain between Northdale and A.S. Sec.#9.W. of T.R. Bridge
U3	Buttercreek Drain -	South of Buttercreek St to Arroyo
U4	Boething Treeland Nursery -	Check any standing water around compost piles
Mountain Meadows South		
#	**Source**	**Description**
V3	Peach Hill Wash, Section 1 -	West of Tierra Rejada, across from High School to area east of end of Dalaway
V4	Peach Hill Wash Drains-	Drainage gutters on both side of wash from Mtn. Trail to County line.
V7	Mountain Meadows/Country Trail gutter	



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City of Moorpark

OFFICE OF THE CITY MANAGER

799 Moorpark Avenue, Moorpark, California 93021 (805) 517-6212 Fax (805) 532-2528

March 21, 2011

To Distribution
(see page 3)

Subject: **City of Moorpark Vector Control District**
Notice of Intent to apply Aquatic Larvicides and Adulticides for Vector Control as part of the City's Integrated Vector Management Program.

Pursuant to the provisions stated in the National Pollutant Discharge Elimination System (NPDES) Permit (Order No. 2011-*****-DWQ) [General Permit No. CAG*****] adopted on March 1, 2011, by the State Water Resources Control Board, notice is hereby given that the City of Moorpark Vector Control Division (Division) intends to perform larvicide applications as part of its Integrated Vector Management Program.

The Division's activities are conducted year-round within a 12 square mile area contained within the City of Moorpark. Treated areas may be under the jurisdiction of Ventura County Public Works, Environmental Health, and Watershed Protection District; Fish and Game; and the Army Corp of Engineers.

Applications are made in an effort to protect the public's health from vector-borne diseases, and are based on key vector and arbovirus surveillance indicators and in strict compliance with pesticide label requirements. The following materials may be used:

Trade Name	Active Ingredient
Larvicides:	
Agnique MMF	Poly (oxy-1,2-ethanediyl), α-(C_{16-20} branched and linear alklyl)-ω-hydroxy
BVA-2	Highly refined petroleum distillate
GB 1111 (Golden Bear)	Aliphatic petroleum hydrocarbons
Altosid Liquid Larvicide (A.L.L.)	(S)-Methoprene
Altosid Pellets	(S)-Methoprene
Altosid SBG (Granule)	(S)-Methoprene
Altosid 30 (Briquets)	(S)-Methoprene
Altosid XR (Briquets)	(S)-Methoprene
Altosid XRG	(S)-Methoprene
Altosid WSP (Pellets)	(S)-Methoprene
Vectobac G (Granule)	*Bacillus thuringiensis*, subsp. *Israelensis*

Trade Name	Active Ingredient
Larvicides:	
Vectobac CG (Granule)	*Bacillus thuringiensis*, subsp. *Israelensis*
Vectobac 12AS (Liquid)	*Bacillus thuringiensis*, subsp. *Israelensis*
Vectobac TP	*Bacillus thuringiensis*, subsp. *Israelensis*
Vectolex CG (Granule)	*Bacillus sphaericus* Serotype H5a5b, strain 2362
Vectolex WDG (Dried Concentrate)	*Bacillus sphaericus* Serotype H5a5b, strain 2362
Vectolex WSP	*Bacillus sphaericus* Serotype H5a5b, strain 2362
Vectomax CG	*Bacillus sphaericus* Serotype H5a5b, strain 2362 and *Bacillus thuringiensis*, subsp. *Israelensis* Serotype H-14 Strain AM65-52
Vectomax G	*Bacillus sphaericus* Serotype H5a5b, strain 2362 and *Bacillus thuringiensis*, subsp. *Israelensis* Serotype H-14 Strain AM65-52

If you have any questions regarding this Notice of Intent, please contact Mark Westerline, Vector/Animal Control Specialist, at 805-517-6290 or email mwesterline@ci.moorpark.ca.us.

Sincerely,

Steven Kueny

Steven Kueny
City Manager

C: Hugh Riley, Assistant City Manager
David Klotzle, Interim City Engineer/Public Works Director
John Brand, Senior Management Analyst
Shaun Kroes, Senior Management Analyst
Mark Westerline, Vector/Animal Control Specialist

Distribution

California Department of Fish and Game
South Coast Region
4949 Viewridge Avenue
San Diego, CA 92123
Attn: Ed Pert, Regional Manager

United States Army Corps of Engineers
Los Angeles District
P.O. Box 532711
Los Angeles, CA 90053-2325
Attn: Col. R. Mark Toy, Commander and District Engineer

United States Fish and Wildlife Service
Ventura Fish and Wildlife Office
2493 Portola Road Suite B
Ventura, CA 93003

Ventura County
Government Center
Administration Building
800 S. Victoria Avenue
Ventura, CA 93009
Attn: Jeff Pratt, Director, Public Works Department
Attn: Norma Camacho, Director, Watershed Protection District
Attn: Robert Gallagher, Director, Environmental Health