COUNTY OF LOS ANGELES

DEPARTMENT OF PUBLIC WORKS

"To Enrich Lives Through Effective and Caring Service"

GAIL FARBER, Director

900 SOUTH FREMONT AVENUE
ALHAMBRA, CALIFORNIA 91803-1331
Telephone: (626) 458-5100
http://dpw.lacounty.gov

ADDRESS ALL CORRESPONDENCE TO:
P.O. BOX 1460
ALHAMBRA, CALIFORNIA 91802-1460

RECEIVED
JUL 08 2014
DIVISION OF WATER QUALITY

IN REPLY PLEASE
REFER TO FILE: FM-0

July 3, 2014

Mr. Philip Isorena, P.E.
Chief, NPDES Wastewater Unit
Division of Water Quality
State Water Resources Control Board
1001 I Street, 15th Floor
Sacramento, CA 95814

Dear Mr. Isorena:

BALLONA CREEK AND CENTINELA CREEK – AQUATIC VECTOR CONTROL PESTICIDE APPLICATION

We are requesting coverage under General Permit Water Quality Order No. 2011-0002-DWQ, Statewide General National Pollutant Discharge Elimination System (NPDES) for Aquatic Vector Control Applications (General Permit).

As the Director of Public Works for the County of Los Angeles, I hereby duly authorize Mr. Sree Kumar, Assistant Deputy Director, to serve as representative for the purpose of signing and submitting the above-referenced application; all reports required by the General Permit; and information requested by the Regional Water Board, State Water Board, or U.S. Environmental Protection Agency pertaining to the General Permit.

Very truly yours,

GAIL FARBER
Director of Public Works

JQC:gy

cc: Vector Control Permits (Gil Vasquez)

JUL 08 2014

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			
County of Los Angeles Department of Public Works (Public Works)			
B. Mailing Address			
900 S. Fremont Avenue, Annex Building 2nd Floor			
C. City	D. County	E. State	F. Zip Code
Alhambra	Los Angeles	CA	91803
G. Contact Person	H. Email address	I. Title	J. Phone
Sree Kumar	skumar@dpw.lacounty.gov	Asst. Deputy Director	(626) 458-4170

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: _____
Name of the conveyance system: _____

3. Directly to river, lake, creek, stream, bay, ocean, etc.
☑ Name of water body: Ballona Creek and Centinela Creek

* 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 Los Angeles 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 ☑ Vector Larvae ☐ Adult Vector

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

Bacillus Thuringiensis Israelenis (BTI) - No degradation byproducts

C. Period of Application: Start Date July 1, 2014 End Date Continuous

D. Types of Adjuvants Added by the Discharger: None

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

A. Printed Name: Sree Kumar

B. Signature: _____ **Date:** 7/3/14

C. Title: Asst. Deputy Director - Flood Maintenance Division

X. FOR STATE WATER BOARD USE ONLY

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

July 3, 2014

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS
NOTICE OF INTENT TO APPLY AQUATIC LARVICIDES FOR VECTOR CONTROL
BALLONA AND CENTINELA CREEKS

An identical original of the attached letter was sent to each of the following:

The Honorable Don Knabe
Supervisor, Fourth District
County of Los Angeles
822 Kenneth Hahn
Hall of Administration

California Coastal Conservancy
1330 Broadway,13th Floor
Oakland, CA 94612-2530

California Coastal Commission
South Coast District Office
2000 Oceangate,10th Floor
Long Beach, CA 90802-4416

California Department of Fish and Wildlife
Attention Gerry Ruth
Streambed Alteration Program
South Coast Region 5
3883 Ruffin Road
San Diego, CA 92123

L. B. Nye, Chief
Section 401 Water Quality Certification
California Regional Water Quality Control
Board
320 W. 4th Street
Los Angeles, CA 90013

City of Los Angeles
Department of Public Works
200 N. Spring Street, Rm 356
Los Angeles CA 90012

City of Los Angeles
Department of Recreation and Parks
221 N. Figueroa Street, 1st Floor
Los Angeles, CA 90012

County of Los Angeles
Department of Agricultural
Commissioner/Weights & Measures
12300 Lower Azusa Road
Arcadia, CA 91006

County of Los Angeles
Department of Beaches and Harbors
13837 Fiji Way
Marina del Rey, CA 90292

County of Los Angeles
Department of Parks and Recreation
433 South Vermont Avenue
Los Angeles, CA 90020

United States Army Corp of Engineers
P O Box 532711
Los Angeles CA 90053-2323

U.S. Fish and Wildlife Services
Attention Ms. Christine Medak
Ecological Services Field Office
Pacific Region 1
6010 Hidden Valley Road
Carlsbad, CA 92008-4219

JQC:gy
F-0/FLDHOME/SGARCIA/STATE LABELS

COUNTY OF LOS ANGELES

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July 3, 2014

IN REPLY PLEASE
REFER TO FILE: FM-0

NOTICE TO POTENTIALLY INTERESTED AGENCIES

COUNTY OF LOS ANGELES DEPARTMENT OF PUBLIC WORKS NOTICE OF INTENT TO APPLY AQUATIC LARVICIDES FOR VECTOR CONTROL BALLONA AND CENTINELA CREEKS

This Notice of Intent is made in compliance with the provisions stated in the National Pollutant Discharge Elimination System, Pesticide General Permit (General Permit), Water Quality Order No. 2011-0002-DWQ, which was adopted on March 1, 2011, and was amended by Water Quality Order No. 2012-0003-DWQ on April 3, 2012, and Water Quality Order No. 2014-0038-EXEC on March 12, 2014. The General Permit will expire on February 29, 2016.

The County of Los Angeles Department of Public Works (Public Works) intends to apply larvicides to the Ballona Creek and Centinela Creek channel sections outside of and above the proposed Ballona Wetlands Restoration Project. These two channel reaches, originally built by the U.S. Army Corps of Engineers, are subject to the ebb and flow of tide. The treatment sites are as shown in the attached Ballona Creek & Centinela Creek Vector Treatment map, with applications to be scheduled between the months of April and October of each year.

The treatment areas are as follows:

Ballona Creek

Upstream end: Inglewood Avenue
GPS Coordinates: latitude 33.989766, longitude 118.411766

Downstream end: South side of the State Highway 90 Marina Freeway bridge
GPS Coordinates: latitude 33.980885, longitude 118.423551

Centinela Creek

Upstream end: North side of Interstate Freeway 405 Bridge
GPS Coordinates: latitude 33.986877, longitude 118.400796

Downstream End: Confluence of Centinela and Ballona Creeks
GPS Coordinates: latitude 33.9790-89, longitude 118.424920

Larvicide applications are made in an effort to keep midge populations under nuisance levels for the surrounding Marina del Rey and Playa del Rey communities and in strict compliance with pesticide label requirements. Non-biting midges, or *chironomids*, are posing serious nuisance problems along the Ballona and Centinela Creeks. Essentially harmless, non-biting midges can have a large-scale economic impact to people and businesses located near the water. While adults do not feed and live only a few days in order to reproduce, their sheer numbers can pose significant problems for resort areas, golf courses, or homeowners. Closely related to mosquitoes and black flies, *Chironomid* larvae develop in mud along the edges of eutrophic water – water with unusually high nutrient content. This may include channels, rivers, lakes, ponds, and lagoons that have experienced overfertilization from surrounding urban development.

The active ingredient in the insecticide to be used is a microbial larvicide called *Bacillus Thuringiensis Israelis* or BTI. BTI is labeled for the control of aquatic midge larvae, which helps reduce the adult vector population in surrounding areas. BTI is highly target specific and has been found to have significant effects only on mosquitoes, aquatic midge larvae, and closely-related insects such as black flies. BTI has no measurable toxicity to vertebrates and is classified by the U.S. EPA as "Practically non-toxic to humans and does not pose risk to wildlife, non-targeted species, or the environment when they are used according to label directions." As such, the General Permit did not include a Receiving Water Monitoring Trigger for BTI. It contains naturally produced bacterial protein generally regarded as environmentally safe, leaving no residue, and is quickly biodegraded. With the application rates used for midge control, BTI is unlikely to have any measurable effect on water quality. Other naturally occurring strains of this bacterium are commonly found in aquatic habitats.

Please contact our Area Engineer, Mr. Ed Teran, at (562) 861-0316, eteran@dpw.lacounty.gov, or Ms. Jemellee Cruz at (626) 458-4170, jcruz@dpw.lacounty.gov with your comments or concerns.

Very truly yours,

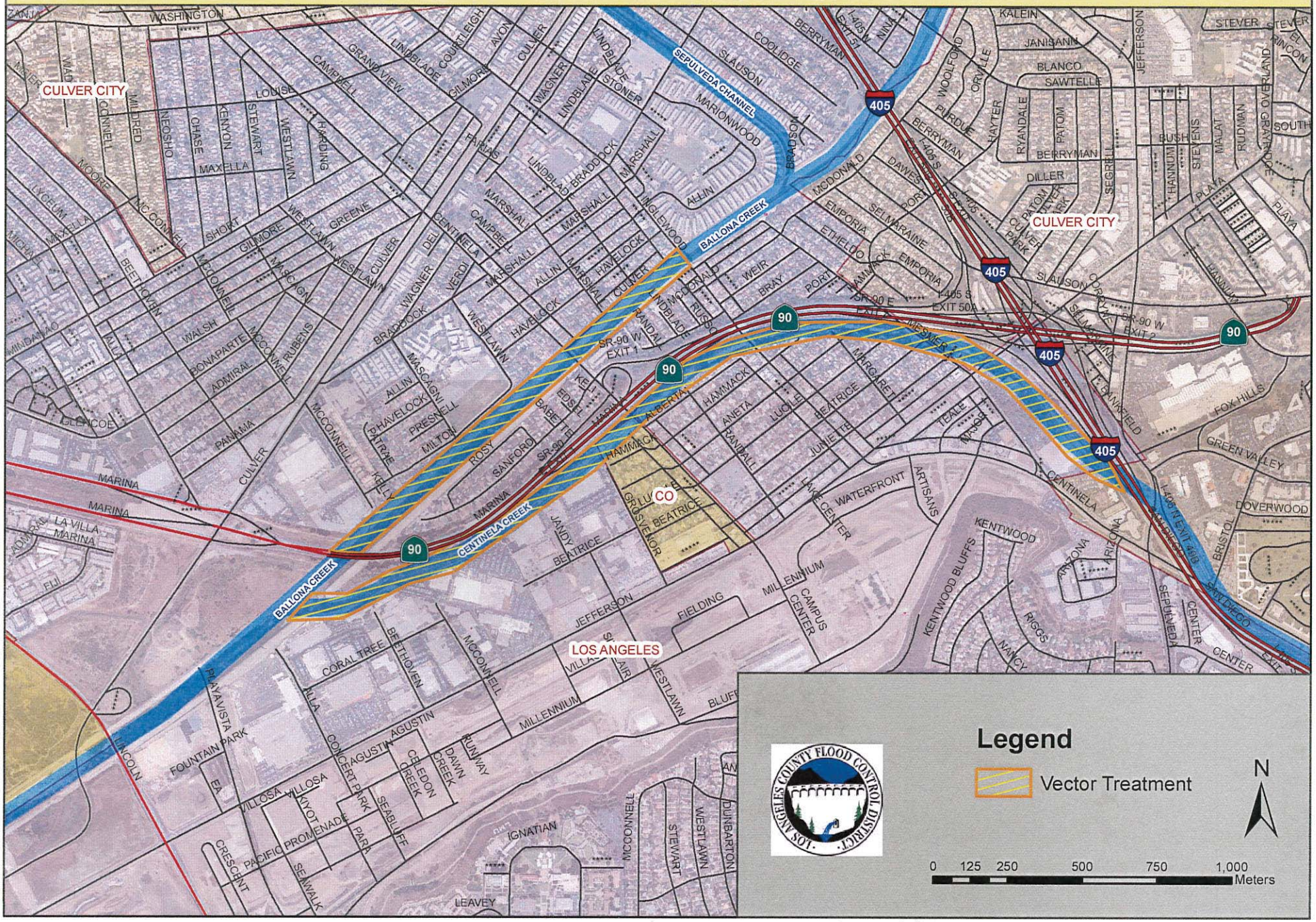
GAIL FARBER
Director of Public Works

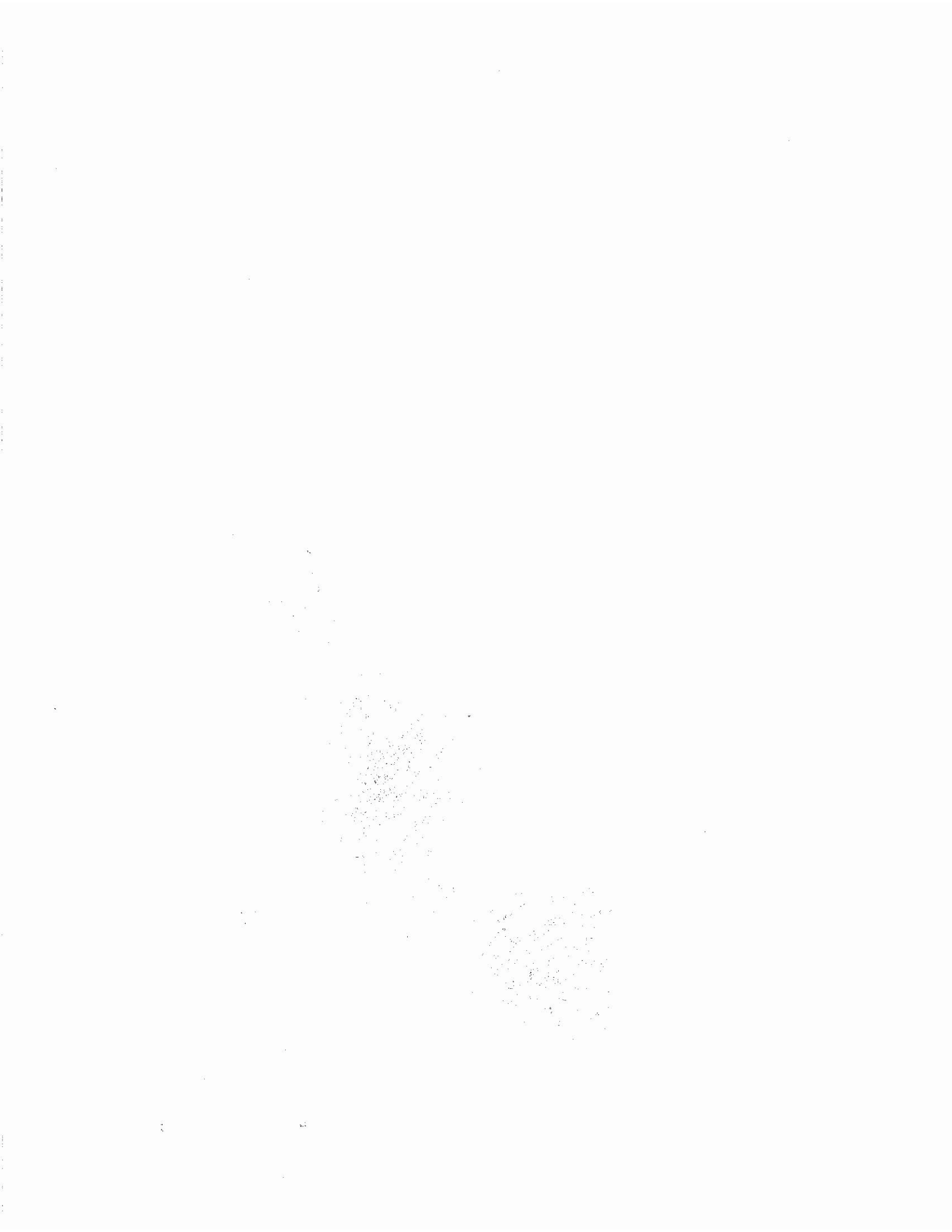


SREE KUMAR
Assistant Deputy Director
Flood Maintenance Division

JQC:gy
C:\MyFiles\PW24268\Vector Control Districts\Ballona & Centinella Creek Vector NPDES permit\Notice to affected governmental agencies.docx

BALLONA CREEK & CENTINELA CREEK VECTOR TREATMENT





JUL 08 2014
JUL 08 2014

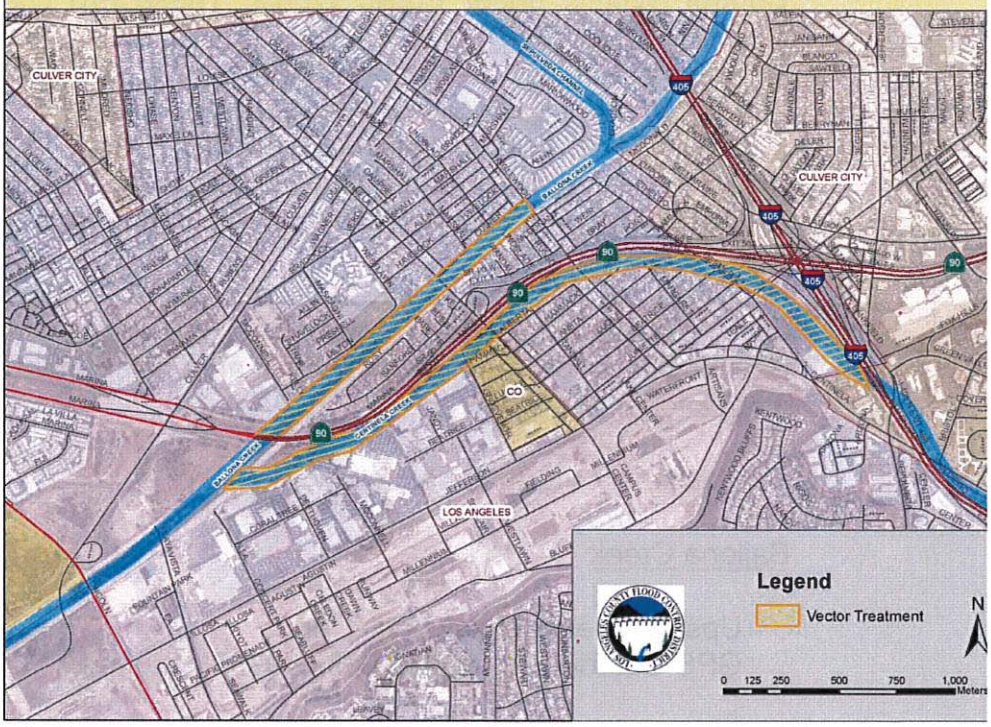
NPDES General Permit for Vector Control Application

Water Quality Order No. 2011-0002-DWQ

PESTICIDE APPLICATION PLAN (PAP) BALLONA CREEK AND CENTINELA CREEK

VECTOR CONTROL PROGRAM

BALLONA CREEK & CENTINELA CREEK VECTOR TREATMENT



COUNTY OF LOS ANGELES
DEPARTMENT OF PUBLIC WORKS
(PUBLIC WORKS)

7/3/2014

Pesticide Application Plan (PAP)
Ballona Creek and Centinela Creek
Los Angeles County Flood Control District

This PAP is prepared on behalf of the County of Los Angeles Department of Public Works (Public Works) to participate in the General Permit Water Quality Order No. 2011-002-DWQ, Statewide General National Pollutant Discharge Elimination System (NPDES) for Aquatic Vector Control Applications (General Permit).

The NPDES Permit requires a PAP containing the following elements:

1. **Description of ALL target areas if different from the waterbody of the target area, into which larvicides and adulticides planned application or may be applied to control vectors. The description shall include adjacent areas if different from the water body of the target areas:**

   The Ballona Creek and Centinela Creek are two flood control channels maintained and operated by Public Works and are partially subject to the ebb and flow of tide. The treatment areas are outside of and above the proposed Ballona Wetlands Restoration Project. The channels, containing both concrete and soft-bottom channel inverts, were originally built by the U.S. Army of Corps of Engineers, with maintenance responsibilities transferred over to the Los Angeles County Flood Control District, under Public Works. These two channels are surrounded by the Marina del Rey and Playa del Rey communities, located in the City of Los Angeles and unincorporated territories of the County of Los Angeles. The channels were built and constructed as flood control facilities to convey storm and nuisance flows from the upstream and surrounding communities. There are a numbers of homeowner associations that have been established by the various builders that have developed residential communities adjacent to these channels.

   Public Works intends to apply larvicides called Bactimos PT to the Ballona Creek and Centinela Creek channels. These sections are outside of and above the proposed Ballona Wetlands Restoration Project area. Treatment is between the months of April and October of each year.

   The treatment areas are as follows:

   <u>Ballona Creek</u>

   Upstream end: Inglewood Avenue
   GPS Coordinates: latitude 33.989766, longitude 118.411766

   Downstream end: south side of State Highway 90, Marina Freeway bridge
   GPS Coordinates: latitude 33.980885, longitude -118.423551

Centinela Creek

Upstream end: north side of the Interstate Freeway 405 bridge
GPS Coordinates: latitude 33.986877, longitude -118.400796

Downstream End: Confluence of Centinela and Ballona Creeks
GPS Coordinates: latitude 33.9790-89, longitude -118.424920

2. Factors influencing the decision to select pesticide applications for vector control:

Application activities are directed toward control of the aquatic midge in its aquatic, larval stage. This approach allows control activities to be concentrated in localized areas within the treatment area using the least toxic materials. Adult midge will not be targeted using aquatic pesticides. This permit does not cover the use of adult pesticides and no adult pesticide will be used on or over the Ballona and Centinela Creeks.

Larvicide applications are made in an effort to keep midge populations under nuisance levels for the surrounding Marina del Rey and Playa del Rey communities and in strict compliance with pesticide label requirements. The Ballona and Centinela Creeks experience hatches of aquatic midges generally in the spring and summer. Absent Public Works' continued efforts in trying to use alternative midge control strategies, these hatches of midges have a severe impact on the surrounding community. The adult swarms force residents to seal their homes to exclude the insects. They cannot use their decks and patios during these times. The aquatic midge swarms generate an excessive amount of feces that builds up on their decks, sticks on newly painted exterior of homes, damaging these surfaces and causing significant economic damage. Resident complaints are received through Public Works' Frequently Asked Questions online system, phone calls to the field office, email requests to the Area Engineer and supervisors, and field meetings.

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:

Pesticides to be used by our applicators are bio-larvicides as described below in this PAP.

Bacterial larvicides consist of spores of certain species of bacteria containing naturally produced proteins, which are toxic to midge larvae when ingested in sufficient quantities. Although they are biologically derived agents, products containing them are labeled and registered by the U.S. Environmental Protection Agency (U.S. EPA) as pesticides.

The active ingredient in the insecticide to be used is a microbial larvicide called *Bacillus thuringiensisv, Israelis,* or BTI. BTI is labeled for the control of aquatic midge larvae, which helps reduce the adult vector population in surrounding areas. Product name include Bactimos PT. BTI is highly target specific and has been found to have a significant effect only on mosquito, aquatic midge larvae, and closely related insects such as black flies. BTI has no measurable toxicity to vertebrates and is classified by the U.S. EPA as "Practically non-toxic to humans and does not pose risks to wildlife, non-targeted species, or the environment when they are used according to label directions." As such, the General Permit did not include a Receiving Water Monitoring Trigger for BTI. BTI contains naturally produced bacterial proteins generally regarded as environmentally safe. It leaves no residue and is quickly biodegraded. Other naturally occurring strains of this bacterium are commonly found in aquatic habitats.

Bacterial insecticides must be fed upon larvae in sufficient quantity to be effective. Therefore, applications must be carefully timed to coincide with periods in the lifecycle when larvae are actively feeding. Pupa and late 4th stage larvae do not feed and therefore, cannot be controlled by BTI. Low water temperature inhibits larval feeding behavior, reducing the effectiveness of BTI during cooler months. The presence of high concentrations of organic material in treated water can also reduce the effectiveness of BTI. As a result of fewer storm events the past several years, sediment within the soft-bottom channel sections at Ballona Creek has accumulated within the upper sections of the channel. It is therefore recommended that pesticide application be conducted between the warmer periods of April and October of each year.

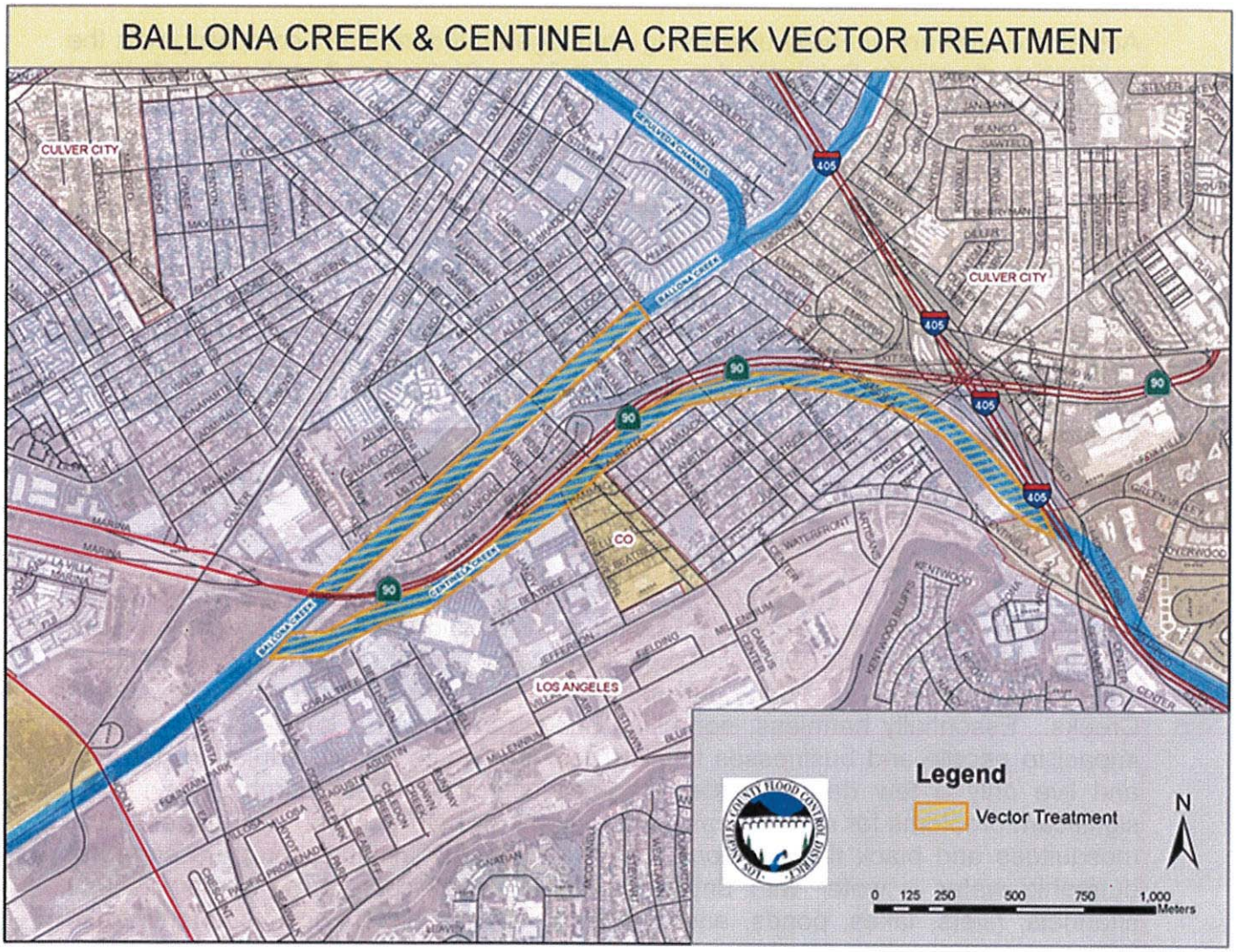
Increasing the frequency of surveillance for larvae can ensure that bacterial insecticides are applied during the appropriate stage of development to prevent adult midge emergence.

4. **Description of ALL the application areas and the target areas in the system planned to be applied or may be applied. Provide a map showing these areas:**

The Ballona Creek and Centinela Creek are both flood control channel reaches that are inundated and affected by the daily tidal influence from the Pacific Ocean. The vector treatment area for Ballona Creek involves a total area of 12.2 acres. Ballona Creek's upstream treatment area begins at the concrete-lined channel invert on Inglewood Avenue. The concrete-lined channel bottom ends and transitions into a soft-bottom channel invert underneath the Centinela Avenue bridge. The downstream treatment area is located on the south side of the Marina Freeway 90, a soft-bottom channel section.

The vector control treatment area for the Centinela Creek covers a total of 14.8 acres. The upstream treatment area for the Centinela Channel begins on the upstream side of the Interstate Freeway 405 bridge. The downstream treatment area ends at the confluence of the Ballona and Centinela Creeks. The treatment area mainly consists

of concrete-lined channel, except for about 200 feet of soft-bottom lined channel invert north of the confluence. Please see the following Ballona and Centinela Creeks Vector Treatment map below.



5. Other control methods used (alternatives) and their limitations:

Algal and mud will be periodically scraped off as often as possible during the warmer weather within the concrete-lined channel invert to eliminate ponded water and reduce vector breeding. Midges survive in the accumulated sediment and vegetation along the slope edges of the soft-bottom channel sections. Pesticide application is the only alternative for the control of midges within these flood control channels that are subject to tidal influence.

6. How much product is needed and how the amount is determined:

The amount of product needed per treatment is approximately 400 pounds per month based on the expected treatment areas in the channels and with an application rate of 25 pounds per acre.

Actual use will vary annually depending on midge abundance and complying with the application directions. Public Works is also working with the Los Angeles County West Vector & Vector-Borne Disease Control District (West Vector District), who currently manages and monitors two vector surveillance/collection traps downstream of our channel treatment areas. These traps collect, identify, and monitor adult mosquitos and midges. Collecting adult mosquitos and midges can provide several important pieces of information. When traps are set at specific locations over a period of time, or in response to service requests, an increase in the mosquito/midge population can be detected. Once these mosquitos/midges are identified, control measures can then be more easily directed. Information obtained from these trap collections determines the effectiveness of control measures that are in place, which may require conducting more frequent concrete-lined channel clearing and applying pesticides on a more frequent rate.

7. Representative monitoring locations and justification for selecting these locations:

Larvicide applications are made in an effort to keep midge populations under nuisance levels for the surrounding Marina del Rey and Playa del Rey communities and in strict compliance with pesticide label requirements. Non-biting midges, or *chironomids*, are posing serious nuisance problems along the Ballona and Centinela Creeks. Essentially harmless, non-biting midges can have a large-scale economic impact to people and businesses located near the water. While adults do not feed and live only a few days in order to reproduce, their sheer numbers can pose significant problems for resort areas, golf courses, or homeowners. Closely related to mosquitoes and black flies, *Chironomid* larvae develop in mud along the edges of eutrophic water – water with unusually high nutrient content. This may include channels, rivers, lakes, ponds, and lagoons that have experienced overfertilization from surrounding urban development.

The Ballona and Centinela Creeks vector treatment areas are about 2.5 miles upstream of the Dockweiler State Beach and are outside of and above the proposed Ballona Wetlands Restoration Project. Even though these channels are close to a recreational beach, the application over months will not cause water quality issues for nearby recreational use areas.

Bacterial larvicides consist of spores of certain species of bacteria containing naturally produced proteins, which are toxic to midge larvae when ingested in sufficient quantities. Although they are biologically derived agents, products containing them

are labeled and registered by the U.S. Environmental Protection Agency (U.S. EPA) as pesticides.

The active ingredient in the insecticide to be used is a microbial larvicide called *Bacillus Thuringiensis Israelis* or BTI. BTI is labeled for the control of aquatic midge larvae, which helps reduce the adult vector population in surrounding areas. BTI is highly target specific and has been found to have significant effects only on mosquitoes, aquatic midge larvae, and closely-related insects such as black flies. BTI has no measurable toxicity to vertebrates and is classified by the U.S. EPA as "practically non-toxic to humans and does not pose risk to wildlife, non-targeted species, or the environment when they are used according to label directions." As such, the General Permit did not include a Receiving Water Monitoring Trigger for BTI. It contains naturally produced bacterial protein generally regarded as environmentally safe, leaving no residue, and is quickly biodegraded. With the application rates used for midge control, BTI is unlikely to have any measurable effect on water quality. Other naturally occurring strains of this bacterium are commonly found in aquatic habitats.

Bacterial insecticides must be fed upon larvae in sufficient quantity to be effective. Therefore, applications must be carefully timed to coincide with periods in the lifecycle when larvae are actively feeding. Pupa and late 4th stage larvae do not feed and therefore, cannot be controlled by BTI. Low water temperature inhibits larval feeding behavior, reducing the effectiveness of BTI during cooler months. The presence of high concentrations of organic material in treated water can also reduce the effectiveness of BTI. Cost per acre treated is generally higher than surfactants or organophosphate insecticides.

Increasing the frequency of surveillance for larvae can ensure that bacterial insecticides are applied during the appropriate stage of development to prevent adult midge emergence.

As discussed above, Public Works is working with the West Vector District to obtain the midge count reports from the midge/mosquito trapping collection and monitoring stations they manage downstream of our proposed treatment areas. Public Works staff, including licensed pesticide applicators (Applicators) and contractors will inspect these channels periodically throughout the seven months where aquatic midge problems can occur; perform visual inspection of adult midge population during periods of concern; and record complaints from nearby residents. Information received will be noted and used to schedule treatments.

The Monitoring and Reporting program for Ballona and Centinela Creeks will comply with the monitoring procedures and reporting requirements as described in the attached Water Quality Order 2014-0038-EXEC, which amended the Monitoring and reporting Program for Water Quality Order 2011-0002-DWQ. The amendment replaced the visual, physical, and chemical monitoring requirements with reporting of visual observations, monitoring, and reporting of application rates, and reporting of

non-compliant applications. The annual reports will be submitted to the SWRCB on March 1 of each year.

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:**

   Our Best Management Practices (BMPs) ensure that available least toxic control methods are considered and that new methods are evaluated on an ongoing basis by consulting with our local entymologist and/or working with the West Vector District in obtaining information on new and more effective yet less toxic chemicals they recommend and methodologies they find to be more effective. If effective, Public Works will incorporate this into our larval control program. Implementation of BMPs will eliminate the need to use conventional insecticides other than larvicides. Materials to be used by Public Works are the least toxic available. The use of these materials will virtually eliminate impact to water quality caused by the use of conventional chemical based aquatic insecticides.

9. **Description: Implemented BMPs shall include, at a minimum:**

   a. **Measures to prevent pesticide spill**

      All safety, handling, and use requirements and instructions are followed per pesticide product labels and Material and Safety Data Sheets. BMPs will be implemented per label directions. All Applicators receive annual spill prevention and response training. Applicators will ensure that application equipment is in proper working order. Spill mitigation devices are placed in all vehicles and pesticide storage areas.

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

      Applicators will apply BTI using a backpack power granule applicator or other approved methods. The applicator will calibrate and use equipment per manufacturer's directions.

   c. **The plan to educate Coalition's or Discharger's staff and pesticide applicator on any potential adverse effects to waters of the U.S. from pesticide application:**

      No detectable adverse effects are expected from the use of BTI. Applicators are trained on the use of the equipment and proper application, and will be educated on the specific product prior to use. This will be included in the pesticide applicators annual pesticide application and safety training, continuing education programs, and/or regional NPDES Permit training programs. Applicators are

licensed by the State of California's Vector Control Technicians and are required to complete such trainings.

d. Description of specific BMPs for each spray mode, e.g., aerial spray, truck spray, hand spray, etc:

BMPs for the handheld unit are attached. The Applicator calibrates truck-mounted and handheld larviciding equipment each year to meet application specifications. Supervisors review application records daily to ensure appropriate amounts of material are being used. Ultra-low volume (ULV) application equipment is calibrated and droplet size to meet label requirements. Public Works will not administer or contract for aerial adulticiding treatments.

e. Descriptions of specific BMPs for each pesticide product used; and

BMPs for the BTI product, Bactimos PT, are per attached label. These include, but are not limited to, the following:

- Do not apply directly to treated, finished drinking water reservoirs or drinking water receptacles when the water is intended for human consumption.
- Applicators must wear a dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95, or P-95. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.
- Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco.
- Do not contaminate water, food, or feed by storage or disposal.
- Wear protective clothing and self-contained breathing apparatus.
- For spill or release, recover product and place in an appropriate container for disposal. Avoid breathing dust. Ventilate and wash spill area.

f. Description of specific BMPs for each type of environmental setting (agricultural, urban, and wetland).

Public Works will implement the following BMPs, as appropriate:

- Keep channels clean and well-maintained. Periodically scrape algae, mud, sediment, silt, debris, and unwanted vegetation from concrete-lined channels. Maintain channel grade and prevent areas of standing water.
- Improve drainage channels and grading to minimize potential for standing water. Keep drainage channels free of excessive vegetation and debris to provide rapid drainage.
- Report any evidence of standing water to responsible maintenance personnel.

- Provide reasonable access on existing roads and levees to allow for monitoring, abatement, and implementation of BMPs. Make shorelines of natural, agricultural, and constructed water bodies accessible for periodic maintenance, midge monitoring and abatement procedures, and removal of emergent vegetation.
- Inspect levees at least annually and repair as needed.

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 U.S., 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;

Public Works is working with the West Vector District to obtain the midge count reports from their midge/mosquito trapping collection and monitoring stations located downstream of the treatment areas. Applicators will inspect these channels periodically throughout the seven months where aquatic midge problems can occur, perform visual inspection of adult midge population during periods of concern, and record complaints from nearby residents. Information received will be noted and used to schedule treatments.

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

Midge Flies are the target species. Since they are primarily a nuisance concern in the warm season, treatment is planned for the period of April through October each year.

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

Known breeding areas are the flood control channels. Public Works, along with the application of BTI, will perform frequent maintenance activities to ensure an effective source reduction and larval control program for these channels. These maintenance activities include algal scraping and mud removal to remove or eliminate ponding within the concrete-lined channel inverts.

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

As discussed above, Public Works is working with the West Vector District to obtain midge count reports from their midge trapping collection and monitoring stations downstream of the treatment areas. Applicators will inspect these channels periodically throughout the seven months where aquatic midge problems can occur, perform visual inspection of adult midge population during period of concern, and record complaints from nearby residents. Information received will be noted and used to schedule treatments.

11. Examination of Alternatives. Dischargers shall continue to examine alternatives to pesticide use in order to reduce the need for applying larvicides 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**
- **Prevention**
- **Mechanical or physical 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:

Algal and mud will be scraped to eliminate ponded water within the concrete-lined channel invert and to reduce breeding in the channels. For a more effective control of midges during the early spring and summer, LACFCD will implement both the use of BTI pesticide application and conduct appropriate channel maintenance activities at these two concrete-lined channel reaches. For the soft-bottom channel sections of the treatment areas, the only alternative is the use of pesticides. Midges survive in the accumulated sediment and vegetation along the slope edges of the soft-bottom channel sections. Pesticide application is the only alternative for the control of midges within these flood control channels that are subject to tidal influence.

b. Applying pesticides only when vectors are present at a level that will constitute a nuisance or threat to public health:

Midge Flies are the target species. Since these flies are primarily a nuisance concern in the warm season, treatment is planned for the period of April through October every year.

c. Using the least intrusive method of pesticide application:

Public Works BMPs ensure that available least toxic control methods are considered and that new methods are evaluated on an ongoing basis and, if effective, incorporated into our larval control program. Implementation of BMPs, such as scraping off algal and mud within the concrete-lined channels, will eliminate the need to use conventional insecticides (organophosphates and carbamates) as larvicides. Pesticides to be used by Public Works are the least toxic available. The use of these materials virtually eliminates impacts on water quality which could be caused by the use of conventional chemical based aquatic insecticides. The least toxic control methods and materials to be used by BTI formulations do not leave residue beyond the timeframe of the intended purpose of their application. Therefore, monitoring of BTI is not possible or proposed.

d. Public education efforts to reduce potential vector breeding habitat:

Public education efforts are an important part of any vector control operation. Public Works is working with the West Vector District to utilize their excellent resources for the public in terms of education on these subjects. We use these information and other professional resources to train both our staff and the public to understand the differences between the mosquito and midge impacts to our flood control channels and how each species require different eradication or prevention methodologies.

e. Applying a decision matrix concept to the choice of the most appropriate formulation:

Public Works will conduct an annual review of our BMPs to reflect any new practices and ensure that least toxic methods and materials continue to be evaluated and incorporated as they become available. Any changes or revisions to our BMPs will be reported annually. Public Works will complete all requirements of the general permit related to pesticides other than those outlined in the BMPs in this document.

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 application techniques and equipment, taking into account the weather conditions and the need to protect the environment.

Pesticide applications will be performed according to the product labels and all other pesticide rules and regulations.

13. **If applicable, specify a website where public notices required in Section VIII.B may be found:**

Public Works is working on creating a website that will specifically post future notifications related to this Vector Control NPDES General Permit.

Bactimos® PT

BIOLOGICAL LARVICIDE

PELLET

ACTIVE INGREDIENT:

Bacillus thuringiensis, subsp. *israelensis*, strain AM 65-52, fermentation solids, spores, and insecticidal toxins	12.3%
OTHER INGREDIENTS	87.7%
TOTAL	100.00%

The percent active ingredient does not indicate product performance and potency measurements are not Federally standardized.

EPA Reg. No. 73049-452
EPA Est. No. 33762-IA-001 List No. 05733

INDEX:

1.0 First Aid
2.0 Precautionary Statements
  2.1 Hazard to Humans and Domestic Animals
  2.2 Environmental Hazards
3.0 Storage and Disposal
4.0 Directions for Use
5.0 Application Directions
  5.1 Application Methods
  5.2 Midges Controlled with Bactimos PT
6.0 Notice to User

KEEP OUT OF REACH OF CHILDREN
CAUTION
For MEDICAL and TRANSPORT Emergencies ONLY
Call 24 Hours A Day 1-877-315-9819.
For All Other Information Call 1-800-323-9597.

1.0 FIRST AID

If in eyes	• Hold eye open and rinse slowly and gently with water for 15-20 minutes. • Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. • Call a poison control center or doctor for treatment advice.
If on skin or clothing	• Take off contaminated clothing. • Rinse skin immediately with plenty of water for 15-20 minutes. • Call a poison control center or doctor for treatment advice.

HOT LINE NUMBER

Have the product container or label with you when calling a poison control center or doctor, or going for treatment. You may also contact 1-877-315-9819 (24 hours) for emergency medical treatment and/or transport emergency information. For all other information, call 1-800-323-9597.

2.0 PRECAUTIONARY STATEMENTS

2.1 HAZARD TO HUMANS AND DOMESTIC ANIMALS

CAUTION

Causes moderate eye irritation. Avoid contact with eyes or clothing. Wash thoroughly with soap and water after handling and before eating, drinking, chewing gum, or using tobacco.

Mixers/loaders and applicators not in enclosed cabs or aircraft, must wear a dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95, or P-95. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.

2.2 ENVIRONMENTAL HAZARDS

Do not apply directly to treated, finished drinking water reservoirs or drinking water receptacles when the water is intended for human consumption.

3.0 STORAGE AND DISPOSAL

Do not contaminate water, food, or feed by storage or disposal.

Storage: Store in a cool, dry place.

Pesticide Disposal: Wastes resulting from the use of this product may be disposed of on site or at an approved waste disposal facility.

Container Disposal: Nonrefillable container. Do not reuse or refill this container. Triple rinse container (or equivalent) promptly after emptying. Triple rinse as follows: Empty the remaining contents into application equipment or a mix tank and drain for 10 seconds after the flow begins to drip. Fill the container 1/4 full with water and recap. Shake for 10 seconds. Pour rinsate into application equipment or a mix tank or store rinsate for later use or disposal. Drain for 10 seconds after the flow begins to drip. Repeat this procedure two more times. Once cleaned, some agricultural plastic pesticide containers can be taken to a container collection site or picked up for recycling or puncture and dispose of in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

4.0 DIRECTIONS FOR USE

It is a violation of Federal law to use this product in a manner inconsistent with its labeling. For any requirements specific to your State or Tribe, consult the agency responsible for pesticide regulation.

5.0 APPLICATION DIRECTIONS

Midge Habitat (Such as the following examples):	Suggested Rate Range*
Man-made or natural lakes, ponds, lagoons, sewage oxidation ponds, channels, ditches used for industrial discharges	25-30 kg/ha (22.3-26.8 lbs/acre)

* Use higher rate in deeper water >0.5 meters (20 inches) of water.

Repeat applications as needed after 2-3 weeks. Control of midges may be gradual over a period of two weeks.

SPECIMEN

5.1 APPLICATION METHODS

Apply Bactimos PT uniformly over the entire surface of the lake or pond. In large lakes/ponds where complete surface treatments are not possible, applications concentrated along the perimeter may be effective in reducing midge populations; most of the nuisance midge larvae of many species will occur within 2 meters of the pond perimeter in <1 meter deep water.

Apply Bactimos PT using conventional ground application equipment such as, hand or motorized spreaders or backpack blowers. A uniform application over the surface of the area to be treated is essential for optimum midge population reduction.

5.2 MIDGES CONTROLLED WITH BACTIMOS PT

Only a small percentage of the thousands of pestiferous species of "non-biting midges" have been tested for susceptibility to Bactimos PT. Members of the subfamily Chironomini and Tanytarsini are generally susceptible; members of the subfamily Tanypodinae are not susceptible at the Bactimos PT labeled-use rate.

When initially using Bactimos PT in a midge control program, it is recommended that only a small test area be treated if the species of midge(s) to be controlled has not been identified.

6.0 NOTICE TO USER

To the fullest extent permitted by law, seller makes no warranty, express or implied, of merchantability, fitness or otherwise concerning use of this product other than as indicated on the label. User assumes all risks of use, storage or handling not in strict accordance with accompanying directions.

Bactimos is a registered trademark of Valent BioSciences Corporation.

VALENT BIOSCIENCES CORPORATION
870 TECHNOLOGY WAY
LIBERTYVILLE, IL 60048 USA
PH: 800-323-9597

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BACTIMOS PT BIOLOGICAL LARVICIDE
MSDS# BIO-0310 Rev. 2 ISSUED 05/22/12

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

MATERIAL NAME: BACTIMOS PT BIOLOGICAL LARVICIDE
EPA Registration No.: 73049-452

MANUFACTURER: Valent BioSciences Corporation
870 Technology Way, Suite 100
Libertyville, Illinois 60048

EMERGENCY TELEPHONE NUMBERS
Emergency Health or Spill:
Outside the United States: 651-632-6184
Within the United States: 877-315-9819

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME: *Bacillus thuringiensis*, subsp. *israelensis*
CONCENTRATION: 12.3 %
CAS/RTECS NUMBERS: 68038-71-1 / N/A
OSHA-PEL 8HR TWA: N/L
STEL: N/L
CEILING: N/L
ACGIH-TLV 8HR TWA: N/L
STEL: N/L
CEILING: N/L
OTHER 8HR TWA: N/A
LIMITS STEL: N/A
CEILING: N/A

INGREDIENT NAME: Inert Ingredients - identity a Trade Secret
CONCENTRATION: 87.7 %
CAS/RTECS NUMBERS: N/A / N/A
OSHA-PEL 8HR TWA: N/L
STEL: N/L
CEILING: N/L
ACGIH-TLV 8HR TWA: N/L
STEL: N/L
CEILING: N/L
OTHER 8HR TWA: N/A
LIMITS STEL: N/A
CEILING: N/A

3. HAZARDS INFORMATION

EMERGENCY OVERVIEW: Similar products are non-toxic by ingestion, skin contact, or inhalation.

ROUTE(S) OF ENTRY: Skin: No
Inhalation: No
Ingestion: No

SKIN CONTACT: Non-irritant

SKIN SENSITIZATION: Non-sensitizer

EYE CONTACT: Causes moderate eye irritation

TARGET ORGANS: N/D

CARCINOGENICITY RATING: NTP: N/L IARC: N/L OSHA: N/L ACGIH: N/L
None

SIGNS AND SYMPTOMS: Direct contact with eyes may cause moderate irritation.

MEDICAL CONDITIONS AGGRAVATED BY EXPOSURE: N/D.

4. FIRST AID MEASURES

EYES: Hold eye open and rinse slowly and gently with water for 15-20 minutes. Remove contact lenses, if present, after the first 5 minutes, then continue rinsing eye. Call poison control center or doctor for treatment advice.

SKIN: Take off contaminated clothing. Rinse skin immediately with plenty of water for 15-20 minutes. Call a poison control center or doctor for treatment advise.

5. FIRE FIGHTING PROCEDURES

FLASH POINT: N/A
FLASH POINT METHOD: N/A
LOWER EXPLOSIVE LIMIT(%): N/A
UPPER EXPLOSIVE LIMIT(%): N/A
AUTOIGNITION TEMPERATURE: N/A

FIRE & EXPLOSION HAZARDS: Non-flammable and no explosive properties.

EXTINGUISHING MEDIA: Use appropriate medium for underlying cause of the fire.

FIRE FIGHTING INSTRUCTIONS: Wear protective clothing and self-contained breathing apparatus.

6. ACCIDENTAL RELEASE MEASURES

SPILL OR RELEASE PROCEDURES: Recover product and place in an appropriate container for disposal. Avoid breathing dust. Ventilate and wash spill area.

7. HANDLING AND STORAGE

HANDLING: Wash hands thoroughly with soap and water after handling and before eating, chewing gum or using tobacco.

STORAGE: Store product in closed container in a cool and dry place.

SPECIAL PRECAUTIONS: Mixer/loader and applicators not in enclosed cabs or aircraft, must wear dust/mist filtering respirator meeting NIOSH standards of at least N-95, R-95 or P-95. Repeated exposure to high concentrations of microbial proteins can cause allergic sensitization.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Use local exhaust.

RESPIRATORY PROTECTION: Not usually required. If necessary, use a MSHA/NIOSH approved (or equivalent) respirator with a dust/mist filter.

SKIN PROTECTION: Impervious gloves, clothing to minimize skin contact.

EYE PROTECTION: Not usually required. If necessary, use safety glasses or goggles.

OTHER PROTECTION: Wash thoroughly with soap and water after handling.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE/PHYSICAL STATE: Tan pellets
ODOR: Faint organic/malt odor
BOILING POINT: N/A
MELTING/FREEZING POINT: N/A
VAPOR PRESSURE (mm Hg): N/A
VAPOR DENSITY (Air=1): N/D
EVAPORATION RATE: N/A
BULK DENSITY: N/D
SPECIFIC GRAVITY: 0.52 - 0.62 g/ml
SOLUBILITY: Suspends readily in water
pH: N/D
VISCOSITY: N/A

10. STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable. No oxidizing or reducing properties.

INCOMPATIBILITIES: Alkalinity inactivates product.

HAZARDOUS DECOMPOSITION PRODUCTS: None that are known.

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

ORAL LD50: N/D. LD50 (rat) > 5,000 mg/kg for a similar, formulated material.

DERMAL LD50: N/D. LD50 (rabbit) > 5,000 mg/kg for a similar, formulated material.

INHALATION LC50: N/D. No lethality in rats after a 4 hour exposure to a similar formulated material at the highest obtainable inhalation exposure chamber concentration.

CORROSIVENESS: N/D. Not expected to have any corrosive properties.

DERMAL IRRITATION: N/D. Transient, slight or mild irritation noted in a dermal toxicity study with a similar, formulated material.

OCULAR IRRITATION: N/D. Transient, redness and conjunctival irritation observed in test animals in a study with a similar, formulated material.

DERMAL SENSITIZATION: N/D. In a study with a similar formulated material, no skin sensitization was observed.

SPECIAL TARGET ORGAN EFFECTS: N/D.

CARCINOGENICITY INFORMATION: N/D. None of the components are classified as carcinogens.

12. ECOLOGICAL INEORMATION

ECOLOGICAL INFORMATION: N/D

13. DISPOSAL CONSIDERATIONS

WASTE DISPOSAL METHODS: Dispose of product in accordance with federal, state, and local regulations.

14. TRANSPORTATION INFORMATION

DOT STATUS: Not Regulated
PROPER SHIPPING NAME: N/D
HAZARD CLASS: N/D
UN NUMBER: N/D
PACKING GROUP: N/D
REPORTABLE QUANTITY: N/D

IATA/ICAO STATUS: Not Regulated
PROPER SHIPPING NAME: N/D
HAZARD CLASS: N/D
UN NUMBER: N/D
PACKING GROUP: N/D
REPORTABLE QUANTITY: N/D

14. TRANSPORTATION INFORMATION, continued

IMO STATUS: Not Regulated
PROPER SHIPPING NAME: N/D
HAZARD CLASS: N/D
UN NUMBER: N/D
PACKING GROUP: N/D
REPORTABLE QUANTITY: N/D
FLASH POINT: N/D

15. REGULATORY INFORMATION

TSCA STATUS: EXEMPT CERCLA STATUS: N/D

SARA STATUS: N/D RCRA STATUS: N/D

PROP 65 (CA): N/D

16. OTHER INFORMATION

REASON FOR ISSUE: Add Full Product Name
APPROVAL DATE: 05/22/12
SUPERSEDES DATE: 01/02/12

LEGEND: N/A = Not Applicable
N/D = Not Determined
N/L = Not Listed
L = Listed
C = Ceiling
S = Short-term
® = Registered Trademark of Valent BioSciences
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Bactimos® PT is a high potency (800 ITU/mg), pellet formulation of *Bacillus thuringiensis* subsp. *israelensis* (Bti, strain AM65-52) designed specifically to control nuisance populations of Chironomid midges (Diptera: Chironomidae). Bactimos PT is designed to sink immediately upon application to assure accurate application of the product to the sites where larval populations develop. The individual pellets typically range from 3 to 10 mm in length with a uniform diameter of ~ 1 mm. Bactimos PT is currently sold in 20 lb cases containing two individual jugs of 10 lbs each. A single application of Bactimos PT can be expected to provide midge control for 3 to 4 weeks.



Midge Life History

Worldwide, chironomids are the most widely distributed and frequently the most abundant aquatic macroinvertebrate in freshwater aquatic environments (Armitage et al. 1995). Some species are also found in brackish and marine water and in terrestrial biotypes. In lentic freshwater eutropic urban environments, the benthic larval stages often occur in huge assemblages and upon emergence, adult midges can be a problem to the general public and industry, even though they do not bite or transmit diseases.

Chironomid midges have four distinct life stages: egg, larva, pupa and adult. The larval stage develops through 4 instars in less than two weeks depending on species and conditions. As with most insects, temperature and food availability control the length of time required for completion of their life-cycle.

Most nuisance midges are in the sub-families Chironominae, Orthocladiinae and Tanypodinae. These classifications are an important aspect of any prospective suppression program as studies have demonstrated a wide range of susceptibility to Bti for the various sub-families. Typically species associated with the sub-family Chironominae are most susceptible to Bti while those associated with the Tanypodinae group are the least susceptible (Ali 1996). The filter feeding Chironominae are more likely to ingest Bti than the scrapers, shredders, collector-gatherers or predators (Tanypodinae, Orthocladids).

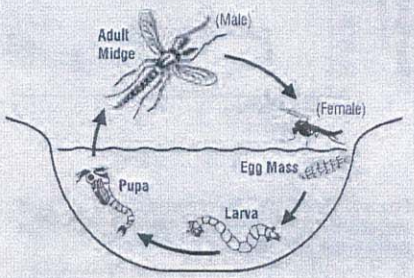
How can you tell midges apart from mosquitoes?

Typical Mosquito	Chironomid Midge
Uses it's proboscis to bite.	Cannot bite.
Wings are longer than it's body.	Wings are shorter than it's body.
Larvae develop in water.	Larvae develop in mud and detritus on the bottom of lakes and ponds.
May carry disease.	Do not carry diseases.



Midge Life Cycle

Stage	Description
Eggs	Eggs are laid in mass on water or on firm, fixed objects along water edge.
Larvae	Hatched larvae develop in bottom organic substrates where they feed upon algae, woody debris, detritus, macrophytes, and invertebrates.
Pupae	Pupae rise to the water surface and emerge as adults.
Adults	Adults will live approximately 1 week depending upon the species and various biotic and abiotic factors. Males form swarms where they capture females for mating.



Why Control Midges?

The emergence and swarming of adult midges from aquatic habitats can create both nuisance and economic problems (Armitage et al 1995):

- Midges congregate in shady cool areas and deposit meconium or release egg-masses which stain surfaces. Adults can deface automobiles, walls, ceilings, curtains and other furnishings.
- They are attracted to light which can cause great discomfort in residential areas.
- Midges can be a problem for paint, paper, pharmaceutical and food processing industries where adults may contaminate final products.
- Economic loss to the hotel and tourism industry can be affected by nuisance swarms that may create stressful conditions for tourists (Anon., 1977).
- Accumulation of dead adults and unattractive spider webs spun around resting adults requires frequent cleaning of properties.
- Large numbers of dead midges can smell like rotting fish that persists in damp weather for several days after removal of adults.
- Midges have been documented to cause allergic reactions including conjunctivitis, dermatitis, rhinitis and asthma.



Midge Control Applications

Midge Habitat	Suggested Rate Range*
Man-made or natural lakes, ponds, lagoons; Sewage oxidation ponds, channels, ditches used for industrial discharges	25-30 kg/ha (22.3-26.8 lbs/ac)

**Use higher rate in deeper water ≥0.5 meters (20 inches) of water. Control of midges may be gradual over a period of two weeks. Repeat applications as needed*

Bactimos PT treatments can be made with many types of ground equipment designed for pellet and granule applications. These devices include manually or mechanically driven devices relying on whirling disk (e.g. Cyclone® seeder, Ortho Whirlybird® seeder) and air-blast applicators (Buffalo® turbine, Maruyama® mist/duster or Stihl® power backpacks). When using Bactimos PT pellets, it is important to properly calibrate application equipment. Pellet output at a given setting, swath width, and required speed/travel should be determined prior to application. Actual field applications should be carefully monitored to be assured that operational applications achieve the desired label rate. Consult your VBC technical specialist to determine optimal application methods to meet your program needs.

Bactimos PT should be applied uniformly over the entire surface of the lake or pond. In large habitats where complete surface treatments are not possible, applications concentrated along the perimeter may be effective in reducing localized midge populations. It is generally agreed that sediment characteristics and water depth are common influences on chironomid assemblages (Lobinske et al. 2002). Larvae of most chironomid spp. of economic importance in the U.S. typically occur in shallower, sand substrates. However, it is suggested that before pursuing perimeter applications, one should confirm larval distribution within the site.

Only a small percentage of the thousands of pestiferous species of "non-biting midges" have been tested for susceptibility to Bactimos PT. Members of the subfamily Chironomini and Tanytarsini are generally susceptible; members of the subfamily Tanypodinae are not susceptible at the Bactimos PT labeled-use rate. When initially using Bactimos PT in a midge control program, it is recommended that only a small test area be treated if the species of midge(s) to be controlled has not been identified.



Susceptibility of midges to Bactimos PT

Boisvert & Boisvert (2000) reported that chironomid larvae are typically 15-75 times less sensitive than some mosquito larvae to Bti; consequently, much higher rates are required to manage chironomids. It is assumed that the near neutral gut pH in many chironomid larvae is the reason for the lower susceptibility of chironomid larvae to Bti toxic proteins than other nematoceran Diptera, specifically mosquitoes. Frouz et al. (2007) showed that in two pestiferous Florida chironomid species, gut pH's of 6.7 – 7.6 were found compared to up to a pH of 11 for mosquitoes. Alkaline pH conditions are usually necessary for activation of spores and the solubilization of Bti toxic protein crystals.



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Field Trials

Figure 1. Site A – Year 1 (2006): Effect of single mid-summer application of Bactimos PT at 27 lbs/acre against midge larvae in South Carolina, U.S.A.

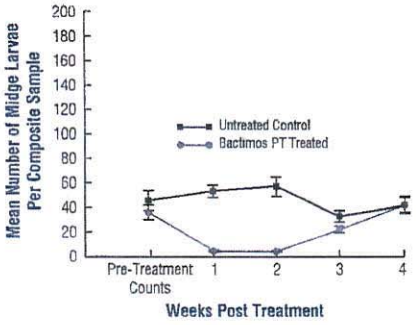


Figure 2. Site A – Year 2 (2007): Effect of single mid-summer application of Bactimos PT at 27 lbs/acre against midge larvae in South Carolina, U.S.A.

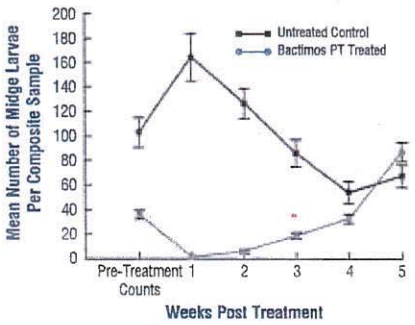
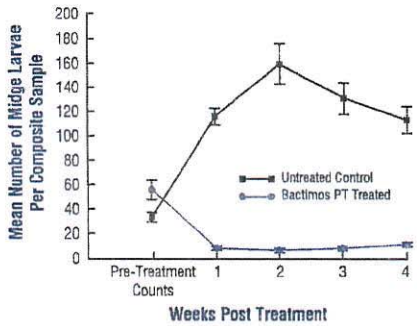


Figure 3. Site B (2007): Effect of single, early fall "band" application of Bactimos PT at 27 lbs/acre against midge larvae in South Carolina, U.S.A.

Note: Treatment targeted a 20 foot band around a portion of the site perimeter



Storage
When stored in a cool, dry place, out of direct sunlight, useful life is expected to be at least two seasons.

Precautions should be taken to provide a long-term storage area that is dry with average temperature below 24° C (75° F) and rodent proof. In northern areas, product can be held in unheated storage facilities. Freezing will not reduce potency.

Container Disposal
Completely empty containers by shaking and tapping sides and bottom to loosen clinging pellets into application equipment. Containers should then be punctured and disposed in a sanitary landfill, or by incineration, or, if allowed by state and local authorities, by burning. If burned, stay out of smoke.

References

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Frouz J, Lobinske R, Yaqub A, Ali A. 2007. Larval gut profile in pestiferous *Chironomus crassicaudatus* & *Glyptotendipes paripes* in reference to the toxicity potential of Bti. JAMCA 23(3):355-358.

Lobinske R, Ali A, Frouz J. 2002. Ecological studies of spatial and temporal distributions of larval Chironomidae with emphasis on *Glyptotendipes paripes* in three central Florida lakes. Environ. Entomol 31:637-647.

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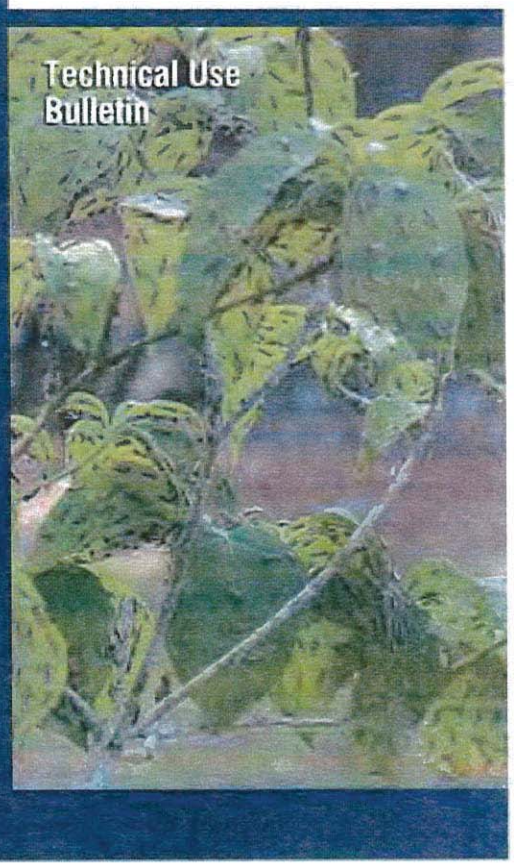
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BIOLOGICAL LARVICIDE
PELLET

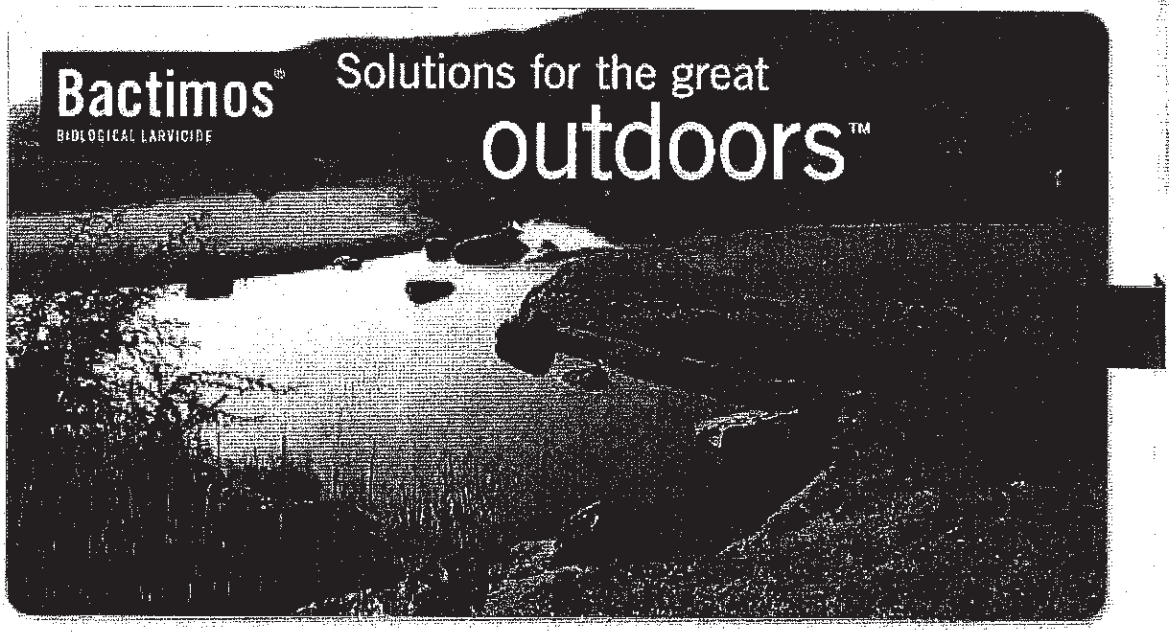
Bactimos® PT

A Bti formulation designed for midge control



PRODUCTS

- VectoBac®
- Teknar®
- VectoLex®
- VectoMax®
- MetaLarv®
- Bactimos®



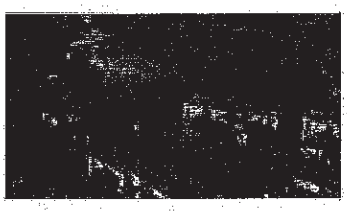
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Bactimos PT



Bactimos PT is a high-potency (800 International Toxin Units [ITU] per milligram) pellet formulation of *Bacillus thuringiensis* subsp. *israelensis* (*Bti*, strain AM65-52) designed specifically to target nuisance populations of non-biting midges (*Chironomidae*). Bactimos PT is designed to sink immediately upon application to assure accurate application of the product to the sites where larval populations develop.



Bactimos PT should be applied uniformly over the entire surface of the lake or pond. In large habitats where complete surface treatments are not possible, applications concentrated along the perimeter may be effective in reducing localized midge populations. Larval sampling in some habitats has indicated that significant larval populations occur within 3–4 meters of the pond perimeter in 1-meter-deep water.

However, before pursuing perimeter applications, one should confirm larval distribution with the site. Only a small percentage of the thousands of pestiferous species of "non-biting midges" have been tested for susceptibility to Bactimos PT. Members of the subfamilies *Chironomini* and *Tanytarsini* are generally susceptible; members of the subfamily *Tanypodinae* are not susceptible at the Bactimos PT labeled-use rate. When initially using Bactimos PT in a midge-control program, it is recommended that only a small test area be treated if the species of midge(s) to be controlled has not been identified.

Suggested Rate Range:

Apply 22–27 lbs/acre (25–30 kg/ha) through conventional ground equipment to typical midge habitats such as man-made/natural lakes, ponds, lagoons, sewage oxidation ponds, channels, and ditches used for industrial discharge.

Use higher rates in deeper water ≥ 20 inches (0.5m). Repeat applications as needed after 2–3 weeks. Control of midges may be gradual over a period of 2 weeks.

It is generally agreed that sediment characteristics and water depth are common influences on *chironomid* assemblages. Larvae of most *chironomid* species of economic importance in the U.S. typically occur in shallower sand substrates; therefore, sampling and control efforts should be concentrated in these areas.

Susceptibility of Midges to Bactimos PT

Chironomid larvae are typically 15–75 times less sensitive than some mosquito larvae to *Bti*; consequently, much higher rates are required to manage *chironomids*. It is assumed that the near-neutral gut pH in many *chironomid* larvae is the reason for the lower susceptibility of *chironomid* larvae to *Bti*-toxic proteins than other nematoceran Diptera, specifically mosquitoes. In two pestiferous Florida *chironomid* species, gut pH levels of 6.7–7.6 units were found compared to up to 11 pH units for mosquitoes. Alkaline pH conditions are usually necessary for activation of spores and the solubilization of *Bti*-toxic protein crystals.

Downloads (pdf)

BACTIMOS PT EQUIPMENT CALIBRATION ▸ | BACTIMOS PT LABEL ▸ | BACTIMOS PT MSDS ▸

BACTIMOS TECHNICAL USE BULLETIN ▸

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