

**FACT SHEET FOR THE
DRAFT
AQUATIC MOSQUITO CONTROL NPDES GENERAL PERMIT**

DATE: March 4, 2015

DEPARTMENT OF ECOLOGY



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EXECUTIVE SUMMARY

This fact sheet is a companion document to the 2015 draft Aquatic Mosquito Control **General Permit** (permit) and explains the nature of the proposed **discharges**, the Washington State Department of Ecology's (Ecology) decisions on limiting the **pollutants** in the receiving water, and the regulatory and technical basis for these decisions. The challenge of this permit is striking a balance between the health of the environment, human health and meeting federal and state regulatory requirements.

Since the *Headwaters, Inc. v. Talent Irrigation District* Ninth Circuit Court decision, Ecology has maintained that to discharge chemicals to waters of the state, coverage under an NPDES permit is required. Ecology has issued general and individual NPDES permits for **discharges** of aquatic **pesticides** and other chemicals since 2002. In 2009, the Sixth Circuit Court ruled in *National Cotton Council et al. v. The Environmental Protection Agency (EPA)* that the discharge of pesticides and their residues to waters of the state requires NPDES permit coverage. This decision means that NPDES permitting is required for all aquatic pesticide applications throughout the United States. EPA developed a general NPDES permit for this purpose (effective October 31, 2011). In Washington, the EPA permit covers aquatic pesticide applications on Federal and Tribal Lands.

Ecology may change the proposed terms, limits, and conditions contained in the draft permit based on comments and testimony it receives during a public comment period. The draft permit does not authorize a violation of surface water quality standards or the violation of any other applicable local, state, or federal laws or regulations. Ecology may require any person seeking coverage under this permit to obtain coverage under an **individual permit** instead.

Ecology proposes to issue this general permit so that dischargers operating under coverage of this permit will comply with the Federal Clean Water Act (CWA) (33 U.S.C. §1251 et seq.) and with the Washington Water Pollution Control Act, chapter 90.48 Revised Code of Washington (RCW). The **Permittee** must notify the public, post signs at **treatment** sites, monitor, and provide annual treatment reports to Ecology.

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INTRODUCTION

This fact sheet is a companion document to the draft Aquatic Mosquito Control General Permit (permit) and provides the legal and technical basis for permit issuance required in chapter 173-226 Washington Administrative Code (WAC). Since 2001, based on *Headwaters v. Talent Irrigation District*, the Washington State Department of Ecology (Ecology) has permitted the discharge of pesticides to waters of the state under **National Pollutant Discharge Elimination System** (NPDES) permits. In 2009, the Sixth Circuit Court ruled in *National Cotton Council et al. v. The Environmental Protection Agency (EPA)* that the discharge of pesticides and their residues to waters of the state requires NPDES permit coverage. This decision means that NPDES permitting is required for all aquatic pesticide applications throughout the United States.

The draft permit covers the discharge of **larvicides** and the incidental discharge of **adulticides** to water bodies in Washington. Ecology may require individual permits where a proposed activity requires additional guidance, or when an individual Permittee requests an individual permit and Ecology agrees to develop and issue one.

This fact sheet explains the nature of the proposed discharges, Ecology's decisions on limiting the pollutants in the receiving water, and the legal and technical basis for these decisions. WAC 173-226-130 specifies the required public notice of the draft permit, public hearings, comment periods, and public notice of issuance before Ecology can issue the general permit. This fact sheet, **application for coverage**, and draft permit are available for review. See Appendix C: Public Involvement for more detail on public notice procedures.

After the public comment period closes, Ecology will summarize and respond to substantive comments. These comments may cause Ecology to revise some of the permit language and requirements. The summary and response to comments will become part of the file for this permit and parties submitting comments will receive a copy of Ecology's response. Ecology will **not** revise this fact sheet after it publishes the public notice. Appendix E: Response to Comments will summarize comments and the resultant changes to the permit.

AQUATIC PESTICIDE LEGAL HISTORY

THE FEDERAL CLEAN WATER ACT (CWA)⁽²³⁾

The Federal Clean Water Act (FCWA, 1972), and later modifications (1977, 1981, and 1987), established water quality goals for the navigable (surface) **waters of the United States**. One of the mechanisms for achieving the goals of the Clean Water Act is the National Pollutant Discharge Elimination System of permits (NPDES permits), which is administered by the Environmental Protection Agency (EPA). The EPA has delegated responsibility to administer the NPDES permit program to the State of Washington based on Chapter 90.48 RCW that defines Ecology's authority and obligations in administering the discharge permit program. Ecology does not have authority to issue NPDES permits to federal facilities or to "**Indian Country**" as defined in 18 USC Sec. 1151.

Ecology and EPA have agreed that in certain instances, Ecology permits for aquatic pesticide use will be issued for discharges on federal land (but not Indian Country). If the discharger is

not a federal *entity* and a federal entity did not make the decision that will cause the aquatic pesticides to be discharged, the appropriate Ecology permit will be used to cover the discharge on federal lands.

THE FEDERAL INSECTICIDE, RODENTICIDE AND FUNGICIDE ACT (FIFRA)⁽²⁵⁾

The following excerpt is from EPA's 2010 NPDES Pesticides General Permit Fact Sheet and explains FIFRA:

EPA regulates the sale, distribution, and use of pesticides in the U.S. under the statutory framework of the Federal Insecticide, Fungicide, and Rodenticide Act of 1979, to ensure that when used in conformance with the label, pesticides will not pose unreasonable risks to human health and the environment. All new pesticides must undergo a registration procedure under FIFRA during which EPA assesses a variety of potential human health and environmental effects associated with use of the product. Under FIFRA, EPA is required to consider the effects of pesticides on the environment by determining, among other things, whether a pesticide will perform its intended function without unreasonable adverse effects on the environment, and whether when used in accordance with widespread and commonly recognized practice [the pesticide] will not generally cause unreasonable adverse effects on the environment. 7 U.S.C. 136a(c)(5).

In performing this analysis, EPA examines the ingredients of a pesticide, the intended type of application site and directions for use, and supporting scientific studies for human health and environmental effects and exposures. The applicant for registration of the pesticide must provide specific data from tests done according to EPA guidelines.

When EPA approves a pesticide for a particular use, the Agency imposes restrictions through labeling requirements governing such use. The restrictions are intended to ensure that the pesticide serves an intended purpose and avoids unreasonable adverse effects. It is illegal under Section 12(a)(2)(G) of FIFRA to use a registered pesticide in a manner inconsistent with its labeling. States have primary authority under FIFRA to enforce "use" violations, but both the States and EPA have ample authority to prosecute pesticide misuse when it occurs.

After a pesticide has been registered, changes in science, public policy, and pesticide use practices will occur over time. FIFRA, as amended by the Food Quality Protection Act of 1996, mandates a registration review program, under which [EPA] periodically reevaluates pesticides to make sure that as the ability to assess risk evolves and as policies and practices change, all registered pesticides continue to meet the statutory standard of no unreasonable adverse effects to human health or the environment. [EPA] is implementing the registration review program pursuant to Section 3(g) of FIFRA and will review each registered pesticide every 15 years to determine whether it continues to meet the FIFRA standard for registration. Information on this program is provided at http://www.epa.gov/oppsrrd1/registration_review/.

FIFRA, as administered by the EPA and the Washington State Department of Agriculture (WSDA), requires that all persons that apply pesticides classified as restricted use be certified

according to the provisions of the act, or that they work under the direct supervision of a certified **applicator**. Commercial and public applicators must demonstrate a practical knowledge of the principles and practices of **pest** control and safe use of pesticides, which they accomplish by means of a “core” examination. In addition, applicators using or supervising the use of any restricted use pesticides purposefully applied to standing or running water (excluding applicators engaged in public health related activities) must pass an additional exam to demonstrate competency as described in the **code of federal regulations** as follows:

Aquatic applicators shall demonstrate practical knowledge of the secondary effects which can be caused by improper application rates, incorrect formulations, and faulty application of restricted pesticides used in this category. They shall demonstrate practical knowledge of various water use situations and the potential of downstream effects. Further, they must have practical knowledge concerning potential pesticide effects on plants, fish, birds, beneficial insects, and other organisms which may be present in aquatic environments. Applicants in this category must demonstrate practical knowledge of the principals of limited area application (40 CFR 171.4).

Any person wishing to apply pesticides to waters of the state must obtain an aquatic pesticide applicator license from WSDA or operate under the supervision of an aquatic licensed pesticide applicator. See www.agr.wa.gov/PestFert/LicensingEd/Licensing.htm for information on Washington licensing requirements and testing.

HEADWATERS, INC. V. TALENT IRRIGATION DISTRICT (MARCH 2001)⁽¹³⁾

In May 1996, as part of routine vegetation management, the Talent Irrigation District (TID) in southern Oregon applied the pesticide acrolein to a system of irrigation canals. Acrolein-**treated** water discharged into a fish-bearing creek causing a fish kill. Subsequently, Headwaters, Inc. and Oregon Natural Resources Council filed a Clean Water Act citizen suit against the TID for applying a pesticide into a system of irrigation canals without an NPDES permit.

The Ninth Circuit Court in *Headwaters, Inc. v. Talent Irrigation District* found that the applicator should have obtained coverage under an NPDES permit prior to application of aquatic pesticides to an irrigation canal. The decision addressed residues and other products of aquatic pesticides.

Reversing a district court’s opinion, the Ninth Circuit Court held that application of the pesticide in compliance with the FIFRA labeling requirements did not exempt TID from having to obtain an NPDES permit and that the irrigation ditches were “waters of the United States” under the CWA (March 12, 2001).

Based on the TID court decision, Ecology, with advice from the Washington State Office of the Attorney General, determined that all pesticide applications to state surface waters required coverage under NPDES permits. Ecology issued its first NPDES general permits for pesticide applications to Washington’s surface waters in 2002. Prior to 2001, Ecology regulated the application of aquatic pesticides to most surface waters by issuing

administrative orders (called Short-Term Modifications of Water Quality Standards) to Washington-state licensed pesticide applicators. Since the Talent decision, there have been further court challenges about the applicability of NPDES permits to aquatic pesticide application as discussed below in this section of the Fact Sheet.

LEAGUE OF WILDLIFE DEFENDERS ET AL. V. FORSGREN (NOVEMBER 2002)⁽¹⁵⁾

In the 1970's, the Douglas Fir Tussock Moth defoliated approximately 700,000 acres of Douglas Fir in Idaho, Oregon and Washington. In response to this outbreak, the United State Forest Service (USFS) developed a system to predict tussock moth outbreaks and control them via aerial spraying of insecticides.

The League of Wildlife Defenders filed suit against the USFS for failing to obtain a NPDES permit under the CWA for the application of insecticides directly above *surface waters*. The USFS argued that any discharge of insecticides was nonpoint pollution, and that the discharges fell under federal exemptions (40 CFR 122.3) for silviculture activities.

The Ninth Circuit Court reversed a district court's opinion upon appeal. It held that aerial spraying (from an aircraft fitted with tanks) directly to, and over, surface water is a point source of pollution, and requires an NPDES permit.

FAIRHURST V. HAGENER (SEPTEMBER 2005)⁽¹⁴⁾

The Montana Department of Fish, Wildlife, and Parks (Department) began a ten-year program to re-introduce threatened native westslope cutthroat trout into Cherry Creek. This project used antimycin to remove non-native rainbow and Yellowstone cutthroat trout from Cherry Creek over several years, after which it would reintroduce native trout.

The Department was sued under the citizen suit provision of the CWA for failing to obtain a NPDES permit before applying antimycin to surface waters. During summary judgment, the district court decided in favor of the Department. On appeal, the Ninth Circuit court affirmed the district court's opinion. The Ninth Circuit opined that:

A chemical pesticide applied intentionally, in accordance with a FIFRA label, and with no residue or unintended effect is not "waste, and thus not a "pollutant" for the purposes of the Clean Water Act. Because the Department's application of antimycin to Cherry Creek was intentional, FIFRA compliant, and without residue or unintended effect, the discharged chemical was not a "pollutant" and the Department was not required to obtain a NPDES permit.

Neither the Court nor the EPA offered any guidance regarding which pesticide applications would result in no residue or unintended effect.

EPA FINAL RULE: APPLICATION OF PESTICIDES TO WATERS OF THE U.S. IN ACCORDANCE WITH FIFRA (NOVEMBER 2006)⁽²⁴⁾

In November 2006, EPA issued a final rule under the CWA entitled *Application of Pesticides to Waters of the United States in Accordance with FIFRA*. This rule replaced a draft interpretive statement EPA issued in 2003 concerning the use of pesticides in or around waters of the United States. The rule stated that any pesticide meant for use in or near water, applied in accordance with the FIFRA label, is not a pollutant under the CWA. Therefore, such applications are not subject to NPDES permitting.

After EPA issued the rule, Ecology met with stakeholders to seek input on how it should regulate the use of aquatic pesticides. Ecology also provided the public with a three-week comment period. Stakeholders affiliated with each of the seven affected permits (Mosquito, Noxious Weeds, Aquatic Plant and Algae, Irrigation, Oyster Growers, Fish Management, and Invasive Moth) commented. The consensus of these stakeholders was that Ecology should continue to issue joint NPDES/state waste permits to regulate aquatic pesticide applications.

To apply a pesticide to the water, state law requires the applicator to obtain a short-term modification of the water quality standards from Ecology. Ecology issued site-specific short-term modifications using an administrative order until 2001, when this process was challenged. Currently, the only legal vehicle for implementing a short-term modification is a permit. State law defines only two types of permits for surface water discharges: NPDES (federal) and State Waste Discharge (state). Because of stakeholder consensus and the need for a permit to implement short-term modifications, Ecology decided that Washington would continue to use NPDES permits as the legal vehicle to regulate the use of aquatic pesticides in and around Washington state waters. Ecology believes that these permits provide the best protection of water quality, human health, and the environment.

NORTHWEST AQUATIC ECO-SYSTEMS V. ECOLOGY (JUNE 2007)⁽¹⁷⁾

In February 2006, the Pollution Control Hearings Board (PCHB) issued a final order in Case #05-101, *Northwest Aquatic Ecosystems v. Ecology, Washington Toxics Coalition*. This case focused on a number of issues, one of which was whether an NPDES permit is required for the use of federally registered pesticides since the Ninth Circuit Court ruled in *Fairhurst v. Hager*.

The PCHB ruled on summary judgment that the *Fairhurst* decision does not provide a blanket exemption for the application of aquatic pesticides. Pesticides must meet identified conditions before Ecology can consider it outside the category of a pollutant under the CWA. The pesticide must:

- (1) *Be applied for a beneficial purpose.*
- (2) *Be applied in compliance with FIFRA.*
- (3) *Produce no pesticide residue.*
- (4) *Produce no unintended effects (Fairhurst, 422 F.3d at 1150).*

Northwest Aquatic Ecosystems failed to provide any evidence specifically addressing how the use of the aquatic herbicides diquat and endothall on the proposed sites would meet the four conditions identified in *Fairhurst*. In the absence of such evidence, *Fairhurst* provided no basis for the PCHB to conclude that an NPDES permit is not required for the proposed pesticide

applications.

NATIONAL COTTON COUNCIL ET AL. V. EPA (JANUARY 2009)⁽¹⁶⁾

In November 2006, EPA issued a final rule under the CWA that determined that pesticides applied in accordance with the FIFRA label are exempt from NPDES permitting requirements. Petitioners filed for review of EPA's final rule in 11 of the 12 federal circuit courts that are able to hear regulatory arguments. The federal courts combined the petitions into one case within the Sixth Circuit Court.

In its opinion, the Sixth Circuit made several findings. First, it agreed with the Ninth Circuit (*Fairhurst v. Hager*) that if a chemical pesticide is intentionally applied to water for a beneficial purpose, and leaves no waste or residue after performing its intended purpose; the discharge would not require a NPDES permit.

Second, the Court found excess pesticides and residues that make their way into waters during and after any pesticide application constitute wastes under the CWA and must have NPDES permit coverage before the discharge occurs.

Finally, the Sixth Circuit determined that because EPA's final rule exempted discharges that the plain reading of the CWA includes as requiring a NPDES permit, the rule cannot stand.

After a later motion, the Sixth Circuit granted EPA a stay on the effective date of this ruling for 24 months to allow the agency time to develop an NPDES permit for aquatic pesticide discharges. EPA issued its general permit on October 31, 2011, for the discharge of pesticides to manage aquatic plants and algae, aquatic animals, mosquitoes and flying insects, and forest canopy pests. In Washington, EPA's general permit covers aquatic pesticide activities conducted on federal facilities, on federal lands when federal entities conduct or authorize the treatment, and on tribal facilities and lands. The state regulates aquatic pesticide application to all other lands/waters.

MOSQUITO BACKGROUND

Mosquitoes are classified as class Insecta, order Diptera, Family Culicidae, and represent more than 200 species in the United States⁽⁵⁴⁾. Mosquitoes from six genera are found in Washington and include *Aedes*, *Anopheles*, *Coquilletidia*, *Culex*, *Culiseta*, and *Ochlerotatus*⁽²²⁾.

MOSQUITO LIFECYCLE^(5,54)

The highly variable mosquito life cycle ranges from one to three weeks, depending on factors such as water temperature and food availability. Mosquitoes will breed wherever water can support their larvae. Only a very small amount of water (such as that trapped in a tire, tin can or hoof print) is necessary to allow successful maturation of mosquitoes, and warmer water causes quicker development of larvae.

Mosquitoes either lay eggs in masses or rafts on the water surface, or deposit their eggs on

moist substrates that will later be flooded with water. Mosquito eggs take 24 to 48 hours to develop and hatch, though eggs of species that deposit on moist substrates may sometimes last for months before they hatch due to flooding of the moist area.

Mosquitoes undergo a complete metamorphosis, which involves four stages of development, egg, larva, pupa and adult. The female mosquito lays the eggs directly on water in “rafts” or on moist substrates that may later be flooded with water. The egg hatches into larva, or “wrigglers.” During the larval stages, a mosquito feeds and goes through four growth stages called instars. When the larva reaches the fourth instar, it stops feeding and pupates. During the pupa stage, the larva rests and undergoes the many internal changes necessary to mature into an adult mosquito. This period lasts a few hours to a few days, after which an adult mosquito emerges from the pupa.

Adult mosquitoes are most active from dusk until dawn when they search for a meal and a mate. Nectar and other plants juices make up most of the adult mosquitoes diet. Only female mosquitoes need a blood meal in order to produce eggs. After the female mosquito takes a blood meal, it deposits eggs to continue the cycle.

DISEASE TRANSMISSION BY MOSQUITOES^(5,6,7,8,9,10,11,12,21,54)

Female mosquitoes of nearly all species require a blood meal (for protein) from vertebrate animals to develop eggs. Several species of mosquito will use humans as blood meal hosts and some of these species can transmit various diseases to humans.

In order for a mosquito to transmit disease to humans, it must first take a blood meal from a host that is carrying a transmittable disease. Most of these hosts are birds and small mammals, making them important to the amplification of diseases in the environment. After taking a blood meal from an infected bird or animal, the mosquito may bite a human, transferring the disease to the human in its saliva. West Nile Virus (WNV) is a good example of this mode of transmission.

Diseases transmitted by mosquitoes and other insects are known as arthropod-borne viruses (arboviral diseases). Globally, the diseases transmitted by mosquitoes to humans include *West Nile virus, encephalitides, dengue, yellow fever, malaria, and filariasis*. Other pathogens transmitted by mosquitoes include *Dirofilaria immitis*, a parasitic roundworm and the causative agent of dog heartworm. Some of these diseases have been *endemic* or *epidemic* diseases in the United States in the past, but today, the arbovirals usually reported are encephalitides and West Nile Virus. Dengue occurs periodically in this country, mostly in the far South.

PUBLIC HEALTH IMPACTS FROM MOSQUITOES^(6,7,8,9,10,12,21)

Currently, only WNV, St. Louis Encephalitis (SLE), and Western Equine Encephalitis (WEE) are known to occur (endemic) in Washington based on DOH comments on the preliminary draft permit. These diseases can cause serious, sometimes fatal neurological ailments in people (the WEE virus also causes disease in horses). WEE infections tend to be more serious in infants while SLE can be more serious for older people. WNV can infect

anyone, though immunocompromised people or those over 50 have the highest probability of developing a severe form of the disease. These viruses normally infect birds and small mammals in the environment. During such infections, the level of the virus may increase in these infected animals (amplification) facilitating transmission to humans by mosquitoes.

WNV, a much publicized arboviral disease in Washington and the U.S, was originally found in the northeastern United States in 1999. Approximately 20 percent of the humans infected with WNV will develop West Nile Fever, which has symptoms similar to influenza, and lasts for a few days to several weeks in rare cases. Of those infected with WNV (not West Nile Fever), approximately 0.7% will develop a severe form of WNV neuroinvasive disease. The neuroinvasive form of WNV can be meningitis, encephalitis, meningoencephalitis, or poliomyelitis⁽¹⁰⁾ and can leave lasting neurological effects after recovery. Most humans infected with WNV will never develop symptoms.⁽¹⁰⁾

Close to 30,000 human cases of West Nile virus have been reported in the U.S. as of the end of 2009. Of those cases, 12,088 were reported as meningitis/encephalitis, 16,765 were West Nile fever, and 771 were unspecified reports. 1,161 mortalities due to the neuroinvasive form of WNV have been reported separately.⁽¹²⁾

In Washington, the first reports of WNV occurred in 2006. Since then, 42 human cases of WNV have been reported, three of which were meningitis/encephalitis. One death occurred due to the neuroinvasive form of WNV in 2009.⁽¹²⁾ Two human cases of WNV have so far been reported in Washington in 2014, though one infection was received out of state.

Even if mosquitoes do not transmit disease when they bite mosquito bites can cause other effects such as irritation, redness, itching, pain, secondary infections and allergic reactions. Though Ecology found no statistics for allergies to mosquito bites, an article in the Journal of Allergy and Clinical Immunology by the Joint Council of Allergy Asthma and Immunology lists life threatening stinging insect (bees, wasps, and ants) allergies as affecting 0.4-0.8% of children and 3% of adults.^(42,43) An assumption that mosquito allergies occur with similar frequency is possible.

MOSQUITO CONTROL

CONTROL/MANAGEMENT OPTIONS

Public agencies, such as those that are components of, or collaborating with, local health departments or are independent districts organized specifically for mosquito control, can best manage mosquitoes using *Integrated Pest Management* on an area wide basis (chapter 17.58 RCW). Washington has approximately 16 *mosquito control districts* (MCDs). Some MCDs are small and have responsibility for mosquito abatement in a few hundred square miles, while the activities of others may encompass one entire county or more.

Public agencies accomplish mosquito control in two ways, by using larvicides and adulticides. Larvicides target the pre-adult stages of the mosquito life cycle (egg, larva, and pupa). Adulticides target the flying adult mosquitoes. Because mosquito larva are concentrated and relatively immobile in waterbodies, they are easier to target and control than adults. MCDs focus most (80-90%) of their control efforts on mosquito larva.

MCDs may also apply adulticides, but ordinarily only when adult populations become so large that they cause extreme annoyance to many people or when the threat of disease transmission to humans or economically important (horses or cattle) livestock is high.

Many larvicidal materials currently in use are biological in origin and are highly specific for mosquitoes (and other dipterans, e.g. flies), with little or no effect on other aquatic organisms. Adulticides commonly used are from the pyrethroid class of chemicals originally derived from the chrysanthemum flower. Other popular adulticides used are organophosphates.

Applicators distribute larvicides by hand or aerially. Hand applications use broadcast spreaders such as backpack granulators and liquid sprayers used to spread control materials either mounted on ATVs or carried by the applicator. Aerial applications normally use a conventional spray boom to improve coverage with the small volume of spray solution applied per acre. The spray produces a large droplet size at low pressure and low volume. The pilot monitors the flow rate to minimize pressure and controls drift by applying when air temperatures and wind speeds are low. Pilots apply larvicides directly to water in order to target the areas where mosquito larvae are rearing.

Applicators use Ultra Low Volume (ULV) application equipment to apply adulticides from air (aerial ULV) and ground (ground ULV) based vehicles. This equipment produces an invisible aerosol of 30-micron (average) size droplets designed to drift so that it affects the most mosquitoes possible. Applications of adulticides typically occur during the periods when mosquitoes are most active and females are searching for a blood meal host, dusk and dawn.

Control of irrigation water in agricultural areas to avoid excess standing water is an important mosquito control method. Anecdotal evidence suggests that water rights (which may be use it or lose it) also play a significant role in this issue on the Eastern part of Washington.

INTEGRATED PEST MANAGEMENT

Integrated pest management (IPM) is an approach to managing selection and use of pest control activities, either singly or in an ecologically-coordinated decision-making strategy. The elements of integrated pest management include: (1) Pest prevention activities; (2) Monitoring for the presence of pests, pest density, and pest damage; (3) Setting **action thresholds** based upon a cost/benefit analysis of potential health, public safety, economic, or aesthetic effects of pests on the interests of producers, society, and the environment to determine whether pest control activities must take place; (4) Selecting pest control activities using a strategy that may employ biological, cultural, mechanical, and chemical control methods; and (5) Evaluating the effectiveness of pest control activities.

RCW 17.15.010 defines integrated pest management to mean a coordinated decision-making and action process that uses the most appropriate pest control methods and strategy in an environmentally and economically sound manner.

EPA regards IPM as meeting technology-based-effluent-limits for aquatic pesticide application (see the EPA Pesticide General Permit). EPA's permit requires that all **applicants** required to file a **Notice of Intent** (NOI) under its Pesticide General Permit develop and implement Pesticide Discharge Management Plans that include IPM practices. EPA also requires any state-issued aquatic pesticide NPDES permits to be at least as stringent as its permit.

MOSQUITO CONTROL PROGRAMS

Mosquito control activities are important to public health, and responsibility for carrying out these programs rests with state and local governments, health departments, and vector or mosquito control districts. Modern mosquito control programs in the U.S. are multifaceted and include **surveillance**, source reduction, and a variety of larval and adult mosquito control methods following IPM strategies. In Washington, mosquito control is provided by mosquito control districts, cities, counties, municipalities (e.g. public utility districts) and commercial pesticide applicators depending on the region and resources available.

PESTICIDE INFORMATION

LARVICIDES

The permit authorizes the discharge of several larvicidal **active ingredients** when an entity is working to control mosquitoes. The active ingredients included for use in the permit are *Bacillus sphaericus* (H-5a5b), *Bacillus Thuringiensis israelensis*, Methoprene, Monomolecular surface films, Spinosad, Malathion, and Temephos.

Bacillus thuringiensis israelensis (Bti)

Bacillus thuringiensis, subspecies *israelensis* (Bti) is a naturally occurring soil bacterium that can effectively kill mosquitoes during the larval stage of development. Bti is an endospore-forming bacterium that is ingested by the actively feeding larvae. When the bacteria Bti encysts, it produces a protein crystal **toxic** to mosquito larvae. Once the bacteria have been ingested, the toxin disrupts the lining of the larvae's intestine causing it to stop eating and die. Bti is the primary material used for mosquito control because of its low toxicity to non-target species. Bti is highly effective against the first through third larval instars of mosquitoes (family Culicidae), blackflies (Family Simuliidae) and has some virulence against certain other Dipteran Families, especially midges (Family Chironomidae). Bti has been extensively studied for effects on non-target organisms and environmental consequences of use with no reported adverse effects. It is not toxic to bees. According to several studies, when applied at field application rates, Bti has no reported effect on fish and amphibians. Studies have also found no effect on warm-blooded mammals. Labels indicate that direct contact with the products may cause mild eye or skin irritation.

Bti products are available in liquid, pellet, granular, and briquette formulations. The type of Bti formulation influences the activity of the product. Generally, Bti does not persist long after application, with toxicity persisting from 24 hours to over one month when the longer lasting formulations are used.

Larval toxicity can depend on the species, its feeding activity and other possible factors such as UV light, water quality, pH, temperature, agitation, and sedimentation. Commercially available Bti strains are sold under several names, including Aquabac, Bactimos, Bonide Mosquito Beater “Plunks”, Healthy Ponds, Sentry, Summit Bti Briquettes, Teknar and Vectobac. A number of Bti products are available for residential use in water bodies, such as lined ornamental ponds, and are sold under various trade names such as Bayer Advanced Garden Mosquito Preventer, Beckett Skeeter Stopper, Mosquito Depth Charges, Mosquito Dunks, Mosquito Bits Quick-Kill, and Spectracide Mosquito Stop.

Bacillus sphaericus (Bs)

Bacillus sphaericus is a naturally occurring (in soils), spore-forming bacterium, which produces a protein endotoxin at the time of sporulation. The toxin is only active against the larval stage and must be ingested and digested before it activates. *B. sphaericus* has the unique property of being able to control mosquito larvae in highly organic aquatic environments such as manure waste lagoons and stormwater catch basins.

B. sphaericus can offer up to six weeks of control in many habitats because the protoxins and spores can remain suspended in the water column for extended periods and due to the recycling of bacteria in dead larvae. Duration of control will depend upon habitat factors such as water depth, flushing, water chemistry and frequency of oviposition to maintain the recycling process. Vectolex, the trade name for *B. sphaericus*, is available in corncob granule, water dispersible granule, and water dispersible pouch formulations.

B. sphaericus was first registered for the control of *Culex* mosquitoes but its uses have been expanded to include control of several *Aedes*, *Anopheles*, *Ochlerotatus*, *Psorophora* and *Coquilettidia* species. *B. sphaericus* is not acutely toxic to freshwater and saltwater invertebrates, honeybees, mayfly larvae, does not appear to be harmful to fish and other marine life, and is not toxic to birds on a sub-chronic basis. In tests, *B. sphaericus* was not pathogenic, infective or toxic in laboratory animals by the oral, dermal, pulmonary and intravenous routes of exposure. In humans, mild skin and eye irritation can occur with direct contact.

Methoprene

Methoprene is a compound that mimics the action of an insect growth-regulating hormone and prevents the normal maturation of insect larvae. Unable to metamorphose, the mosquitoes die in the pupal stage. Methoprene is classified as a biochemical pesticide because it controls mosquito larvae by interfering with the insect’s life cycle rather than through direct toxicity. Methoprene is available in numerous formulations and sold under the product names: Zoecon Altosid, Biosid, and Strike. Formulations labeled for residential use are sold under the names Pre-Strike and Vet-Kem.

Studies indicate that methoprene is of low toxicity and poses little risk to people when used according to label instructions. Methoprene was not shown to have any significant toxicological effects in the standard battery of toxicity studies used to assess human health effects. The pesticide has very low acute oral and inhalation toxicity potential and is not an eye or skin irritant. Methoprene is also of low acute dermal (skin) toxicity and is not a human

skin sensitizer.

In laboratory tests, the toxicity of methoprene to birds and fish is low, and it is nontoxic to bees. Field studies involving methoprene have shown that it has no lasting adverse effects on populations of invertebrates or other non-target aquatic organisms when used according to label instructions for mosquito control. Methoprene mosquito control products present minimal acute and chronic risk to freshwater fish, freshwater invertebrates, and estuarine species. Methoprene is not persistent in the environment. It degrades rapidly in water, being susceptible to transformation by sunlight and microorganisms.

Monomolecular Surface Films

Monomolecular surface film (MMSF) is a non-petroleum surface oil that acts as a physicochemical agent by altering the mosquito's habitat. It belongs to the alcohol ethoxylate group of surfactants (products meant to increase product efficacy), which are used in detergent products. MMSFs disrupt the cohesive properties of water, which allow mosquitoes to use the water's surface as an interface for breeding. In effect, by making the surface "wetter," MMSFs drown mosquitoes.

MMSFs kill larvae and pupae by making it impossible for them to keep their breathing tubes above the water's surface. Mosquitoes that require little or no surface contact for breathing, such as *Coquillettidia* species, require properly timed applications at surface contacting stages—the pupae to emerging adult—for maximum impact. Since MMSFs kill mosquitoes with a physical mechanism (rather than a toxic mechanism), it is not effective in habitats with persistent winds of greater than ten miles per hour, or in areas with very choppy water.

Some species, such as the midge, and some arthropods that require attachment to the water surface have been shown to be affected. MMSF is non-toxic to most non-target wildlife. According to EPA, MMSFs poses minimal risks to the environment when used according to FIFRA label directions. The green tree frog progressed normally from tadpole to adult through several generations after being exposed to a constant film presence for six months. MMSFs are not a skin irritant, is only a mild eye irritant on prolonged or repeated contact, and is considered to be non-toxic by animal tests. As with all pesticides, direct contact should be avoided. The film persistence is dependent on temperature, water flow, amount of bacteria in the water, and the duration and strength of the wind following application. MMSFs typically persist on the water's surface for 5-22 days.

Larvicidal Oils

Oils are used to form a coating on top of water to drown larvae, pupae, and emerging adult mosquitoes. Oils are petroleum or mineral based and are typically used as a product of last resort for the control of mosquito pupae, since this stage does not feed but does require oxygen. Oils can persist for 12 to 15 hours and then evaporate within a few days. Larvicide oils, if misapplied, can be toxic to fish and other aquatic organisms. Studies have shown that aquatic invertebrates, amphibians, waterfowl, furbearers and fish may be negatively affected. The mosquito control permit requires an Ecology approved plan prior to using these products in areas where vulnerable species (candidate, sensitive, threatened or endangered are present.

Malathion

Malathion is a broad spectrum organophosphate insecticide. It is used in agriculture, residential, pharmaceutical, and public health programs across the country to control a large number of pests.

Relatively resistant to UV degradation (photolysis), malathion is susceptible to hydrolysis in alkaline conditions. In neutral to alkaline conditions, the half-life of malathion is 1 to 2 weeks and in acidic conditions, the half-life is 107 days. Information included in the EPA revised RED for Malathion indicate that malaaxon (malathion primary metabolite) can remain stable for at least 72 hours, which is long enough to reach domestic drinking water supplies in some areas.

Half-life in soil is 1 to 25 days, depending on microbial activity, with higher activity resulting in a shorter half-life. Malathion does not *adsorb* to soils very well so it is somewhat mobile in the soil, and has the potential to leach to groundwater.

Like other organophosphates, it works by disrupting the central nervous system through cholinesterase inhibition. Its primary metabolite is malaaxon, is also a cholinesterase inhibitor. Carboxyesterase activity in the body works to reduce the effects of malathion and malaaxon accumulation. Carboxyesterase are more active in mammals than insects, which can explain the higher toxicity in insects.

Malathion has a low toxicity to mammals, though at high doses a decrease in cholinesterase activity and some respiratory lesions during inhalation tests are seen. Symptoms of malathion poisoning include headache, nausea, vomiting, dizziness, muscle weakness, lethargy and anxiety. Life threatening exposure can cause respiratory distress, diarrhea, tremors, confusion, seizures and coma.

Malathion is highly toxic to beneficial insects and aquatic organisms (both vertebrates and invertebrates) during acute and chronic testing. Acute toxicity is not expected in reptiles as they have detoxification efficiency similar to mammals.

The National Marine Fisheries Service (NMFS) completed a biological opinion on the effects of EPA's malathion re-registration decision to endangered Pacific Salmon in 2008. NMFS concluded that EPA re-registration of malathion would jeopardize the existence of 27 endangered populations and adversely modify critical habitat for 25 endangered Pacific salmonids. EPA is required to develop endangered species bulletins at the county level, or include FIFRA label requirements for California, Idaho, Oregon, and Washington that specify:

- Where ground applications are permitted:
- Where aerial applications are permitted
- Wind speeds during application are to be less than 10mph
- Agricultural uses will have a minimum of 20 feet of non-crop vegetation on the downhill side of the application areas immediately adjacent to any surface water that have a connection to salmonid bearing waters.
- Do not apply products when soil moisture is at field capacity or when a weather event is likely to produce run-off from the application site within 48 hours of application

- Report all incidents of fish mortality that occur within 4 days of application and within the vicinity of the application area.
More information about the NMFS biological opinion may be found at http://www.nmfs.noaa.gov/pr/pdfs/pesticide_biop.pdf

However, use of malathion of public health purposes is exempt from the label or bulletin requirements related to the biological opinion.

Malathion use as a larvicide is restricted under Ecology's aquatic mosquito control permit. Malathion may only be used for control of mosquito larvae with Ecology approval after consultation between Ecology and WDFW in response to a public health emergency or ***pesticide resistance*** in a mosquito population. This limits the amount and times that malathion may be discharged to surface waters.

Temephos

Temephos is a broad spectrum, non-systemic organophosphate insecticide. It is registered for use only as a mosquito larvicide. It is a hydrophobic chemical but does bioaccumulate. Nearly 75% of temephos that is bioaccumulated is eliminated over time with no exposure.

Temephos is not very persistent in water, but binds tightly to soils and sediments, though its degraded products do not which could lead to continued suspension or re-suspension in water. Half-life in soil is estimated at 30 days.

Like other organophosphates, Temephos works by disrupting the central nervous system through cholinesterase inhibition. It has a lower toxicity to mammals, but cholinesterase inhibition and reduced liver weights are noted in chronic exposure studies. Testing with rat found that while some temephos remained in the body, most of it was eliminated through feces and urine unchanged. Symptoms of poisoning include headache, sweating, nausea, vomiting, dizziness, loss of coordination, difficulty breathing, and death.

Depending on product formulation, temephos is moderately to very highly toxic beneficial insects and aquatic organisms (both vertebrates and invertebrates) during acute and chronic testing. It is also moderately to highly toxic to some species of birds.

Temephos use as a larvicide is restricted under Ecology's Permit. It is not permitted for use as an adulticide. Temephos may only be used for control of mosquito larvae in non-potable, highly polluted water, water with a high organic contentment (such as sewage lagoons, manure lagoons, or pastures, all of which must have no surface water run-off), or in response to pesticide resistance development within a specific population of mosquitoes. Ecology must approve the use of temephos after consultation between Ecology and WDFW in response to a public health emergency or pesticide resistance. This limits the amount and times that temephos may be discharged to surface waters.

ADULTICIDES

The Permit authorizes the incidental discharge of several adulticide active ingredients. The active ingredients included for use in the permit are Permethrin, Resmethrin, Sumithrin (d-phenothrin), Natural Pyrethrins, Naled, and Piperonyl Butoxide (PBO).

Pyrethrins and Pyrethroids^(28-35,57,59,60)

Natural Pyrethrins are compounds isolated from the chrysanthemum flower (*Chrysanthemum cinerariaefolium*) with insecticidal properties. A number of synthetic derivatives have been created from pyrethrins and are referred to as “pyrethroids.” Pyrethroids are more UV stable (resist UV degradation) and cost effective to produce.

As a group, pyrethrins and pyrethroids all have a similar mode of action. These chemicals interfere with nerve cell sodium channels that serve as part of the nervous system communication system, but it is unknown if all pyrethroids alter the same sodium channels.

Pyrethroids have a very low toxicity to humans and other larger mammals. EPA lists pyrethroid compounds as class 3 or 4 depending on exposure route for acute testing. Class 3 pesticides are rated slightly toxic by EPA, while class 4 is practically non-toxic.

Pyrethroids are toxic to beneficial insects such as butterflies, moths, and bee’s. Insects of similar size (midges) may see an increase in mortality after pesticide application. Larger insects may also be affected. LD₅₀ mortality is seen in *Apis Mellifera* (the domestic honeybee) at an average of 0.08 micrograms(ug)/bee permethrin.^(36,40) EPA lists toxicity to bees from permethrin for dermal exposure at LD₅₀ = 0.13 ug/bee and oral exposure at LD₅₀ = 0.024 ug/bee.

EPA lists pyrethroids as highly toxic to very highly toxic to aquatic organisms. Results from acute testing of active ingredients on freshwater fish range from LC₅₀ 0.28 to 5.1 ppb. Chronic toxicity with freshwater invertebrates lists results for *No Observed Adverse Effect Concentration (NOAEC)* at 0.039 to 0.86 ppb.

Pyrethroids have a high affinity to binding to soils, waterbody sediments and suspended sediments. This high affinity to binding should greatly reduce the likelihood that pyrethroids will leach into groundwater but also reduces the chance for the pyrethroids to degrade due to UV light.

Piperonyl Butoxide^(27,57,59,60)

Piperonyl Butoxide is a chemical that is added to many pesticide formulations. It increases the effect of pyrethrins and pyrethroids by acting as a synergist. PBO increases the insecticidal properties by reducing the effectiveness of the detoxification enzyme that works to eliminate pyrethroids from an insects system. This reduces the dose of pyrethroids necessary to cause mortality in mosquitoes other insects and some small mammals (rats, mice).

PBO is only slightly toxic to humans and other larger mammals, though some transient enzyme inhibition is observed. The target organ being the liver, chronic exposure leading to increases in liver weight. PBO also has a low to very low toxicity to birds.

As a single chemical test, PBO is moderately toxic to aquatic organisms. Acute testing of freshwater fish and invertebrates with a LC₅₀'s of 1.9 and 0.51ppm respectively. NOAEC's have also been estimated for PBO at 0.04ppm for freshwater fish and 0.03 for freshwater invertebrates.

PBO is not used as an adulticide or insecticide as a single active ingredient but always as a synergist for a primary active ingredient.

Naled^(29,57,59,60)

Naled is a broad spectrum, non-systemic organophosphate insecticide. It is registered for use as a mosquito adulticide. Naled has one metabolite that is also an organophosphate pesticide registered with EPA: dichlorvos (DDVP).

Like other organophosphates, Naled works by disrupting the central nervous system through cholinesterase inhibition. Symptoms of poisoning include headache, sweating, nausea, vomiting, dizziness, loss of coordination, difficulty breathing, and death.

Naled is moderately to highly toxic to birds, highly toxic to non-target insects (such as honeybees), moderately to very highly toxic to aquatic organisms and moderately toxic to mammals on an acute basis, with some chronic effects.

Naled use as an adulticide is restricted under Ecology's Permit. It is not permitted for use as a larvicide. Naled may only be used for control of adult in accordance with the permittee's *IPM plan*.

PESTICIDE REGISTRATION LICENSING INFORMATION

The purpose of the *Federal Insecticide, Fungicide, and Rodenticide Act* (FIFRA) is to provide federal control of use, distribution and sale of *pesticide products* in the U.S. All pesticides used in the United States must be registered (licensed) by EPA. Registration helps ensure that pesticides will be properly labeled and that, if used in accordance with label specifications, they will not cause unreasonable harm to the environment.

To register a new pesticide, manufacturers of pesticides must present EPA with technical information supporting the proposed pesticide uses such as risk to humans and the environment, and frequency of use. After review by EPA, a pesticide is registered for narrowly defined uses (e.g. specific crops). Because of the continually increasing knowledge of pesticides and their effects, EPA's goal is to review pesticide registrations every 15 years. More information about FIFRA pesticide registration may be found at <http://www.epa.gov/oecaagct/lfra.html#Registration%20of%20New%20Pesticides>.

FIFRA requires certification of all persons who apply pesticides classified as restricted use. Commercial and public applicators must pass an examination to demonstrate practical knowledge of the principles and practices of pest control and safe use of pesticides. Applicators using or supervising the use of any *restricted use pesticides* applied to standing or running water (excluding applicators engaged in public health related activities) must pass

an additional exam to demonstrate competency as described in the code of federal regulations 40 CFR 171.4.

In addition to FIFRA requirements, the State of Washington requires pesticides be registered for use with the State Department of Agriculture (WSDA), and that pesticide applicators be licensed through WSDA. Any person wishing to apply EPA-registered pesticides to Washington State waters must be licensed as an aquatic pesticide applicator or operate under the direct supervision of a State licensed applicator. For information on Washington State licensing requirements and testing, see the following website: <http://www.agr.wa.gov/PestFert/LicensingEd/Licensing.htm>. Information about pesticide registration in Washington State may be found at <http://www.agr.wa.gov/PestFert/Pesticides/ProductRegistration.aspx#WsdaReg>.

REGULATORY INFORMATION

REGULATORY POLLUTION REDUCTION REQUIREMENTS

Federal and State regulations require that effluent limits in an NPDES permit must be either technology or water quality-based.

- Technology-based limits are based upon the treatment methods available to treat specific pollutants. Technology-based limits are set by the EPA and published as a regulation, or Ecology develops the limit on a case-by-case basis (40 CFR 125.3, and chapter 173-226 WAC).
- Water quality-based limits are calculated so that the effluent will comply with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC), Sediment Quality Standards (chapter 173-204 WAC) or the National Toxics Rule (40 CFR 131.36).
- Ecology must apply the most stringent of these limits to each parameter of concern. These limits are described below.

TECHNOLOGY BASED WATER QUALITY PROTECTION REQUIREMENTS

Sections 301, 302, 306, and 307 of the CWA establish discharge standards, prohibitions, and limits based on pollution control technologies. These technology-based limits are best practical control technology (BPT), best available technology economically achievable (BAT), and best conventional pollutant control technology economically achievable (BCT). Permit writers may also determine compliance with BPT/BAT/BCT using their best professional judgment (BPJ). EPA has stated that for pesticide application to water (in its aquatic pesticide NPDES general permit issued October, 2011) that technology-based requirements are **Best Management Practices** (BMPs); not numeric limits.

Washington has similar technology-based limits described as "**all known, available and reasonable methods of control, prevention, and treatment (AKART)**" methods. State law refers to AKART under RCW 90.48.010, RCW 90.48.520, 90.52.040 and RCW 90.54.020.

The Federal technology-based limits and AKART are similar, but not equivalent. Ecology may establish AKART:

- For an industrial category or for an individual permit on a case-by-case basis.
- That is more stringent than Federal regulations.
- That includes BMPs such as prevention and control methods (i.e. waste minimization, waste/source reduction, or reduction in total contaminant releases to the environment).

Ecology and EPA concur that AKART may be equivalent to best professional judgment (BPJ) determinations.

Historically, EPA has only regulated the pesticide application industry under FIFRA. EPA developed label use requirements to regulate the use of pesticides. EPA also requires the pesticide manufacturer to register each pesticide, provide evidence that the pesticide will work as promised, and minimize unacceptable environmental harm.

The Pesticide Management Division of the Washington State Department of Agriculture (WSDA) ensures that applicators use pesticides legally and safely in Washington. WSDA registers pesticides for use in Washington (in addition to EPA registration); licenses pesticide applicators, dealers and consultants; investigates complaints such as label violations; maintains a registry of pesticide sensitive individuals; and administers a waste pesticide collection program. These duties are performed under the authority of the *Washington Pesticide Control Act* (chapter 15.58 RCW), the Washington Pesticide Application Act (chapter 17.21 RCW), the General Pesticide Rules (chapter 16-228 WAC), the Worker Protection Standard (chapter 16-233 WAC) and a number of pesticide and/or county specific regulations (<http://agr.wa.gov/PestFert/Pesticides/default.htm>).

The standards for environmental protection are different between the CWA and FIFRA. In compliance with the National Cotton Council, et al. v. EPA court decision, all aquatic pesticide applications in the United States occur under NPDES permits (as of October 31, 2011). EPA-delegated states, such as Washington, developed their own state NPDES permits for these activities. EPA developed a general aquatic pesticide NPDES permit for the non-delegated states and federal and tribal lands not delegated under state permitting authority. In Washington, all aquatic pesticide activities taking place on tribal lands must follow EPA permitting guidelines. All federal agency actions taken by federal agencies on federal lands must occur under the EPA permit. Aquatic pesticide applications occurring on federal lands where the federal agency is not the decision maker or applicator may occur under state NPDES permits instead of the EPA permit (by agreement between EPA and Ecology).

After the *Headwaters Inc. v. Talent Irrigation District* decision (2001), Ecology regulated aquatic pesticide application under NPDES permits. Ecology issued its first aquatic pesticide permits in 2002. Since 2002, Ecology has revised and reissued several of its aquatic pesticide permits. It is Ecology's intent that issuing this permit will authorize mosquito control activity that cause a discharge of larvicides or adulticides in a manner that complies with federal and state requirements.

All wastewater discharge permits issued by Ecology must incorporate requirements to implement reasonable prevention, treatment, and control of pollutants. Ecology acknowledges that applicators could treat the pollutants addressed in this permit only with

great difficulty due to the diffuse nature and low concentrations that exist after the pesticides have become waste. The *Headwater, Inc. v. Talent* ruling established that aquatic pesticides become waste in the water after the pesticide has performed its intended action and the target organisms are controlled or if excess pesticide is present during treatment.

EXPERIMENTAL USE PERMITS

Entities operating under WSDA-issued *experimental use permits* (WSEUP) need coverage under this permit. WSDA requires WSEUP for all research experiments involving pesticides that are not federally registered or for uses not allowed on the pesticide label. WSDA experimental use permits limit the area that a Permittee can test to one acre or less. WSDA grants experimental use permits for gathering data in support of registration under FIFRA Section (3) or Section 24(c).

When a researcher conducts a test on more than one surface acre of water (per pest), he or she must operate under a federal experimental use permit as well as a state experimental use permit. Any person may apply to the EPA for a federal experimental use permit for pesticides. These permits are usually valid for only one year. Persons holding a federal experimental use permit must also apply for and obtain a state experimental use permit before initiating any shipment of the pesticide to Washington. Ecology requires coverage under the appropriate aquatic pesticide permit for persons operating under a federal experimental use permit.

SURFACE WATER QUALITY-BASED EFFLUENT LIMITS

The Washington State Surface Water Quality Standards (chapter 173-201A WAC) were designed to protect existing water quality and preserve the beneficial uses of Washington's surface waters. Waste discharge permits must include conditions that ensure the discharge will meet established surface water quality standards (WAC 173-201A-510). Water quality-based effluent limits may be based on an individual waste load allocation or on a waste load allocation developed during a basin-wide total maximum daily loading study (TMDL).

Ecology conditions NPDES and waste discharge permits in such a manner that authorized discharges meet water quality standards. The characteristic beneficial uses of surface waters include, but are not limited to, the following: domestic, industrial and agricultural water supply; stock watering; the spawning, rearing, migration and harvesting of fish; the spawning, rearing and harvesting of shellfish; wildlife habitat; recreation (primary contact, sport fishing, boating, and aesthetic enjoyment of nature); commerce; aesthetics and navigation.

NUMERIC CRITERIA

Numeric water quality criteria are published in the Water Quality Standards for Surface Waters (chapter 173-201A WAC). They specify the levels of pollutants allowed in receiving water to protect aquatic life and recreation in and on the water. Ecology uses numeric criteria along with chemical and physical data for the wastewater and receiving water to derive effluent limits in the

discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limits, the discharge must meet the water quality-based limits.

The EPA has published 91 numeric water quality criteria for the protection of human health that are applicable to dischargers in Washington State (40 CFR 131.36). EPA designed these criteria to protect humans from exposure to pollutants linked to cancer and other diseases, based on consuming fish and shellfish and drinking contaminated surface waters. The Water Quality Standards also include radionuclide criteria to protect humans from the effects of radioactive substances.

NARRATIVE CRITERIA

Narrative water quality criteria (e.g. WAC 173-201A-240(1); 2006) limit the toxic, radioactive, or other deleterious material concentrations that may be discharged to levels below those which have the potential to:

- Adversely affect designated water uses.
- Cause acute or chronic toxicity to biota.
- Impair aesthetic values
- Adversely affect human health

Narrative criteria are statements that describe the desired water quality goal, such as waters being “free from” pollutants such as oil and scum, color and odor, and other substances that can harm people and fish. Ecology uses these criteria for pollutants for which numeric criteria are difficult to specify, such as those that offend the senses (e.g., color and odor). Narrative criteria protect the specific designated uses of all freshwaters (WAC 173-201A-200) and of all marine waters (WAC 173-201A-210) in the State of Washington.

ANTIDegradation ANALYSIS AND ANTIDegradation PLAN

The following narrative represents Ecology’s antidegradation analysis and antidegradation plan for the Aquatic Mosquito Control General Permit. The purpose of Washington's Antidegradation Policy (WAC 173-201A-300 to 330) is to:

- Restore and maintain the highest possible quality of the surface waters of Washington.
- Describe situations under which water quality may be lowered from its current condition.
- Apply to human activities that are likely to have an impact on the water quality of surface water.
- Ensure that all human activities likely to contribute to a lowering of water quality at a minimum apply AKART.
- Apply three Tiers of protection (described below) for surface waters of the state.

Tier I ensures existing and designated uses are maintained and protected and applies to all waters and all sources of pollution. Tier II ensures that dischargers do not degrade waters of a higher quality than the criteria assigned unless such lowering of water quality is necessary and in the overriding public interest. Tier II applies only to a specific list of polluting activities. Tier III prevents the degradation of waters formally listed as "outstanding resource waters," and applies to all sources of pollution.

WAC 173-201A-320(6) describes how Ecology implements Tier I and II antidegradation in general permits. All Permittees covered under the general permit must comply with the provisions of Tier 1. Ecology determined that the permit does not cover discharges to Tier III waters.

Under state law, the use of larvicides and adulticides is in the public interest.

The water quality standards at WAC 173-201A-320(6) describe how Ecology should conduct an antidegradation Tier II analysis when it issues NPDES general permits. This section of the rule requires Ecology to:

- Use the information collected, from implement of the permit, to revise the permit or program requirements.
- Review and refine management and control programs in cycles not to exceed five years or the period of permit reissuance.
- Include a plan that describes how Ecology will obtain and use information to ensure full compliance with water quality standards. Ecology must develop and document the plan in advance of permit or program approval.

Although the antidegradation requirements for general permits state the individual actions covered under a general permit do not need to go through independent Tier II reviews, Ecology considers it important that the public have the opportunity to weigh in on whether individual actions are in the overriding public interest. The antidegradation rule establishes a refutable presumption that they do, but only through a public notice of intent to provide coverage and expected compliance with antidegradation does the general public have an opportunity to question individual actions. Thus, facilities must publish requests for coverage in a local paper. Currently public notices must include:

- A statement that the applicant is seeking coverage under the Aquatic Mosquito Control General Permit.
- The name, address, and phone number of the applicant.
- The identity of the water body proposed for treatment.
- A list of products planned for use.
- The statement: “Any person desiring to present their views to the Department of Ecology regarding this application shall do so in writing within 30 days of the last date of publication of this notice. Comments must be submitted to the Department of Ecology. Any person interested in the Department’s action on the application may notify the Department of interest within 30 days of the last date of publication of this notice.”

This fact sheet describes how the permit and control program meets the antidegradation requirement.

SHORT-TERM WATER QUALITY MODIFICATION PROVISIONS

The short-term water quality modification provision of the draft permit allows the authorized discharges to cause a temporary diminishment of some designated beneficial uses while it alters the water body to control mosquitoes in and around various water bodies across

Washington. The conditions of this permit constitute the requirements of a short-term water quality modification.

A short-term exceedance only applies to short lived (hours or days) impairments, but short-term exceedances may occur periodically throughout the five-year permit term. Short-term exceedances may also extend over the five-year life span of the permit (long-term exceedance) provided the Permittee satisfies the requirements of WAC 173-201A-410.

Washington's Water Quality Standards include 91 numeric health-based criteria that Ecology must consider when writing NPDES permits. The EPA established these criteria in 1992 in its National Toxics Rule (40 CFR 121.36). Ecology has determined that the discharges allowed by this permit do not contain chemicals of concern based on existing data or knowledge.

EVALUATION OF SURFACE WATER QUALITY-BASED EFFLUENT LIMITS FOR NUMERIC CRITERIA

Ecology made a reasonable potential determination on the application of larvicides approved for use in the draft permit based upon Ecology contracted risk assessments for each larvicide active ingredient. Ecology has determined that application of the approved larvicides will not violate water quality standards or degrade existing uses if applicators follow permit BMPs and FIFRA label requirements

Ecology made a reasonable potential determination on the application of adulticides based upon knowledge of mosquito control practices and published research. It based this decision on calculations using available information. Ecology has determined that the application of adulticides will not violate water quality standards or degrade existing uses if applied as described during discussions with MCDs and during deposition studies (see Appendix B: Bibliography) and if applicators follow permit BMPs and FIFRA label requirements.

In summary, Ecology has determined that if applicators properly apply and handle larvicides and adulticides in accordance with the terms and conditions of the general permit, the mosquito control activities will:

- Comply with State water quality standards.
- Maintain and protect the existing and designated uses of the surface waters of the State.
- Protect human health.

New information regarding previously unknown environmental and human health risks may cause Ecology to reopen the general permit.

The short-term water quality exceedance provisions of the draft permit allows the larvicide discharges authorized by the general permit to cause a temporary diminishment of some designated beneficial uses while it alters the water body to protect public health and promote public enjoyment and quality of life. A short-term exceedance only applies to short lived (hours or days) impairments, but short-term exceedances remain available throughout the permit term.

Short term exceedances for the discharge of larvicides may extend over the 5-year life span of the permit (long-term exceedance) provided the Permittee satisfies the requirements of WAC 173-201A-410. The Permittee must develop and implement an integrated pest management (IPM) plan that follows the Administrative Procedures Act (chapter 34.05 RCW) for public involvement and complete a State Environmental Policy Act (chapter 43.21C RCW) evaluation of the proposed activity.

The activities authorized by this general permit do not have a reasonable potential to cause a violation of state water quality standards (WAC 173-201A) so long as Ecology allows the activities under the short-term water quality exceedance provision. The water quality modification provides for an exception to meeting certain provisions of the state water quality standards, such as meeting all beneficial uses all the time. Activities covered under this permit are allocated a temporary zone of impact on beneficial uses, but the impact must be transient (hours or days), and must allow for full restoration of water quality and protection of beneficial uses upon project completion. The conditions of this permit constitute the requirements of a short-term water quality exceedance.

Washington's water quality standards now include 91 numeric health-based criteria that Ecology must consider when writing NPDES permits. The U.S. EPA established these criteria in 1992 in its National Toxics Rule (40 CFR 131.36). Ecology has determined that the Permittee's discharge does not contain chemicals of concern based on existing data or knowledge. Chemicals of concern may be part of the "other ingredients" listed on FIFRA labels. Ecology does not have access to the "other ingredients" because they are proprietary.

SEDIMENT QUALITY

The aquatic sediment standards (WAC 173-204) protect aquatic biota and human health. Under these standards, Ecology may require a facility to evaluate the potential for its discharge to cause a violation of sediment standards (WAC 173-204-400). You can obtain additional information about sediments at the Aquatic Lands Cleanup Unit website. <http://www.ecy.wa.gov/programs/tcp/smu/sediment.html>

Ecology has determined through a review of the discharger characteristics and effluent characteristics that this discharge has no reasonable potential to violate the Sediment Management Standards.

GROUND WATER QUALITY STANDARDS

The Ground Water Quality Standards, (chapter 173-200 WAC), protect beneficial uses of ground water. Permits issued by Ecology must not allow violations of those standards. This permit does not allow the use of any pesticides expected to contaminate groundwater. In the event there are additional concerns, Ecology can issue orders requiring groundwater monitoring under this permit.

SEPA COMPLIANCE

Mosquito control activities have undergone numerous environmental impact evaluations. The draft permit conditions the uses of pesticides to mitigate environmental impacts of concern noted in these evaluations. The conditions of this permit should satisfy any water quality related SEPA concerns.

ENDANGERED AND SENSITIVE SPECIES

EPA has implemented an Endangered Species Protection Program (ESPP) to identify all pesticides that may cause adverse impacts on threatened/endangered species and to implement measures that will mitigate these impacts. When the ESPP identifies an adverse impact, it requires use restrictions to protect these species at the county level. EPA will specify these use restrictions on the product label or by distributing a county-specific Endangered Species Protection Bulletin. Bulletins are enforceable under FIFRA. General Condition G9 of the permit requires the Permittee to comply with all applicable federal regulations.

Ecology has further limited the application of pesticides for mosquito control in areas identified by WDFW as being critical habitat for vulnerable species (endangered, threatened, sensitive and candidate species). See discussion in special condition S4.B.6. for more information.

PROPOSED PERMIT CONDITIONS

It is Ecology's intent to make minimal changes to the requirements of this permit from the 2010 version and this new (2015) version. However, based on Ecology's experience with other aquatic pesticide general permits that it issues, some standardized language and formatting has been developed. The draft permit has been changed to reflect these standardizations. To help understand where these changes were made, Ecology has provided a document summarizing the changes made.

S1. PERMIT COVERAGE

S1.A Activities Covered Under This Permit

Washington's Water Quality statutes and regulations do not allow the discharge of pollutants to waters of the state without permit coverage (RCW 90.48.080, 90.48.160, 90.48.260, and WAC 173-201A WAC). Algaecides, herbicides, insecticides, molluscicides, piscicides and any other chemical or product appropriate for aquatic species management are potential pollutants, and therefore require a discharge permit before application to Washington State surface waters.

All entities that engage in mosquito control activities that result in discharge of larvicides or adulticides to waters of the state must have coverage under the permit as required by Washington statutes and regulations (90.48.080, 90.48.160 and 90.48.260 RCW, 173-226-020 WAC). The discharges requiring permit coverage may be direct or indirect, i.e. the discharge pesticides occurs due to the activity occurring even though it was not the intent to put the

pesticide into surface waters. For example, a direct discharge is applying larvicides to a surface water, while an ***indirect discharge*** is adulticides settling onto a surface water even though the water was not the target area.

Activities covered under a Federal *Experimental Use Permit* must also apply for permit coverage

S2.B Activities That May Not Need Coverage Under this Permit

Ecology has determined not to issue coverage under this permit if the mosquito control activity is covered under another Ecology permit that addresses the discharge of larvicides or adulticides.

Ecology has determined not to issue permit coverage for retention and detention ponds if:

1. Ecology regulates its discharge under another permit (such as industrial or municipal stormwater permits) and the permit allows chemical treatment.
2. There is no discharge to surface waters within two weeks of treatment.

Ecology has determined not to issue permit coverage for constructed water bodies or ***upland farm ponds*** if:

1. The water bodies are five acres or less in surface area, and
2. There is no discharge to surface waters within two weeks of treatment.

Ecology has determined not to issue permit coverage for seasonally dry wetlands if:

1. The wetland is dry at the time of treatment and for two weeks following treatment, and
2. The chemical will not be biologically available when the area is inundated with water.

Ecology has determined not to issue permit coverage for standing water on irrigated fields if:

1. There is no run-off to surface waters of the state or run off to waters of the state through irrigation return flows.
2. There is no discharge to surface waters within two weeks of treatment

Ecology believes that the two-week holding time sufficiently allows the dissipation of the pesticide products that pose a risk to aquatic life prior to possible discharge to surface waters and that if applicators meet these conditions, the treatment does not have potential to violate the Water Quality Standards for Surface ***Waters of the State of Washington*** (chapter 173-201A WAC).

The permit describes these situations so as not to burden Ecology and the mosquito control entities by oversight and permit requirements in situations where Ecology has pre-determined a discharge will not occur.

S1.C Geographic Area Covered

This permit covers the discharge of mosquito control pesticides within the State of Washington where Ecology has authority to regulate discharges. RCW 90.48.020, WAC 173-

201A-020, and WAC 173-226-030 give Ecology the regulatory authority over surface waters. Ecology does not have *jurisdiction* over federal or tribal lands and EPA has not delegated regulatory authority to Ecology to issue NPDES permits on federal and “Indian Country” as defined in 18 USC Sec. 1151.

However, Ecology and EPA have agreed that in certain instances, Ecology permits for aquatic pesticide use will be issued for discharges on federal land (but not Indian Country). If the discharger is not a federal entity and a federal entity did not make the decision that will cause the aquatic pesticides to be discharged, or provide money for the project, the appropriate Ecology permit will be used to cover the discharge on federal lands.

S2.PERMIT ADMINISTRATION

Ecology plans to issue the Permit for a period of 5 years, starting on the effective date of the permit (WAC 173-226-330). Coverage under the permit will last from the date of coverage to the date of permit expiration, which will be up to 5 years.

S2.A Who Must Obtain Permit Coverage

A definition of “Permittee” is not provided in chapter 90.48 RCW, chapters 173-216, 173-220, or 173-226 WAC, nor is one provided in 40 CFR 122 (EPA NPDES Permit Program) or State NPDES Permit Programs. Based upon the usage of Permittee in federal and Washington State statute and regulation, Ecology understands the term “Permittee” to mean *“The entity that has applied to Ecology and been issued coverage under this general permit for a discharge of pollutants to waters of the State of Washington.”* For the full definition of “Permittee”, see Appendix A: Definitions.

For this permit, Ecology has established that the Permittee (the entity who must obtain permit coverage) is the aquatic or public health licensed pesticide applicator or a government entity (e.g. MCD, County, etc).

Commercial applicators who are Permittees must have a project *sponsor* for each permit coverage. Generally each coverage will have a single sponsor. This follows the model of the Aquatic Plant and Algae Management General Permit and ensures that the Permittee is applying larvicides and adulticides at the request of the entity who has authority to allow the activity to take place on the property.

Government entities that are Permittees (e.g. MCD, county, city) are their own sponsor, even if they contract with a commercial applicator for mosquito control services.

S2.B How to Apply for Permit Coverage

Applicants must submit a complete application for permit coverage to Ecology a minimum of 60 days before applying larvicides or adulticides where a discharge will occur (RCW 90.48.170).

A new applicant must submit a complete application to Ecology including a NOI, map of the proposed coverage area, and a completed and signed SEPA checklist (or SEPA determination if another entity is SEPA lead). In addition, if the applicant will be using adulticides, it must

develop an IPM plan before publishing public notice. This is so that the public has a chance to comment on the plan the applicant will be following under its permit coverage. An official who has signature authority (WAC 173-226-200) for the entity applying for permit coverage must sign all documents. Ecology must receive the complete application for permit coverage on or before the publication date of the public notice the permit applicant posted in a newspaper of general circulation (WAC 173-226-130). Ecology considers a newspaper of general circulation as the major newspaper publication for a region.

When Ecology receives a new applicant's complete application before public notice it can review the application and communicate necessary changes on application documents. Communication (prior to publishing public notice) about document changes can save the applicant money by identifying any necessary changes (and the possible need to redo public notice) before the applicant publishes and sends out the public notice.

The public has the opportunity to comment on the permit application and the proposed coverage during the 30 days after publication of the second public notice (public comment period) (WAC 173-226-130(4)). Ecology will consider comments about the applicability of the permit to the proposed activity received during this period. If Ecology receives no substantive comments, it may issue permit coverage on the 38th day following receipt of a complete application. Third parties have the right to appeal coverage decisions (WAC 173-226-190).

S2.C How to Modify Permit Coverage

At times a Permittee may need to modify the conditions under which it applied for permit coverage to cope with new or changing circumstances. For example, a MCD could have its boundaries expanded. This is a change in the discharge originally authorized by permit coverage and as such, requires that the permit coverage be modified. Modification of permit coverage requires that the Permittee submit an updated permit application, publish public notice once a week for two consecutive weeks, and wait for the end of the 30 day public comment period the same as it would if the Permittee were applying for a new permit coverage. This is because the public must have the opportunity to comment on, for example, the new area proposed for coverage that was not part of the original permit application and public notice.

S2.D How to Transfer Permit Coverage

The use of and submittal of a Transfer of Coverage form developed by Ecology is required. This form standardizes the agreement between two parties to transfer the responsibility for complying with permit requirements (WAC 173-226-210).

S2.E How to Terminate Permit Coverage

Ecology plans to issue the permit for a period of up to five years, starting on the effective date of the permit (WAC 173-226-330). Coverage will last from the date of coverage to the date of permit expiration, which may be up to five years, unless the Permittee terminates coverage by submitting a *notice of termination* or unless Ecology terminates the permit early. If the Permittee does not terminate coverage, the Permittee will continue to incur an annual permit fee, even if it does not apply larvicides or adulticides. However, if the Permittee terminates coverage, and later decides to begin mosquito control activity again, it the Permittee will need to start the permit

application process from the beginning.

S3. DISCHARGE LIMITS

S3.A Compliance with Standards

See also the section "Technology-Based Water Quality Protection Requirements" for a discussion about AKART. Ecology also believes that following all permit conditions, the Permittee's IPM plan (if using adulticides), and the FIFRA label will meet AKART for this permit. Ecology based the IPM plan requirements on:

- A similar planning requirement in EPA's NPDES Pesticides General Permit application. In its fact sheet, EPA considers Integrated Pest Management (IPM) to meet technology-based standards.
- Integrated Pest Management Law (chapter 17.15 RCW).
- Washington's Water Quality Standards (WAC 173-201A-110).

S3.B Temporary Exceedance of Water Quality Standards

In 2006, Ecology updated the Water Quality Standards for Surface Waters of the State of Washington (chapter 173-201A WAC). The standards allow a temporary exceedance of water quality standards for up to five years (the term of a general permit) provided the Permittee has followed certain guidelines. WAC 173-201A-410(2) requires that for Ecology to extend the exceedance for up to five years, and not limit it to hours or days, the Permittee must develop and implement an IPM plan. The Permittee must develop the plan following the Administrative Procedures Act for public involvement (chapter 34.05 RCW) and must complete a State Environmental Policy Act (chapter 43.21C RCW and chapter 197-11 WAC) review of the proposed activity. Permittees who do not meet these requirements must ensure that the short-term exceedance of water quality standards is limited to only hours or days. Ecology may also request updated plans and addendums to existing plans.

S3.C Impaired Water Bodies

Ecology periodically reviews water quality data to determine if water bodies meet criteria. Section 303(d) of the CWA requires that waters not meeting criteria undergo an evaluation of the cause and amount of the contaminant. Ecology publishes Total Maximum Daily Load (TMDL) reports, which may establish limits on the amounts of pollutants contributors may discharge.

Water bodies across Washington are on the 303(d) list for many parameters. A search of the 303d database (<http://apps.ecy.wa.gov/wats/Default.aspx>) did not turn up any water bodies listed as impaired for any of the larvicides or adulticides allowed for use in this permit. Ecology believes that further impairment is unlikely through activities permitted under this permit.

S4. PRODUCT USE

S4.A Active Ingredients Authorized for Use

This section contains a list of the active ingredients that are allowed for use under the permit. Ecology permits active ingredients because pesticide product formulations vary greatly, can

change, and new products are introduced. By using active ingredients, Ecology does not need to maintain a list of pesticide products and modify the permit when changes to the product occur. The active ingredient is also the primary chemical which causes toxic effects to target organisms.

S4.B Pesticide Application Requirements

Permittees must comply with the pesticide label requirements and all applicable permit conditions. Coverage under this general permit does not supersede or preempt federal or state pesticide product label requirements or any other applicable laws and regulations. It is the responsibility of the Permittee to determine if there are other applicable requirements pertaining to this activity and to comply with these requirements. General Condition G9 reminds the Permittee of this fact. The permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights. In some instances, depending on what entity is the Permittee, Permittees treating under this permit may need to obtain permissions to access and treat private land (see RCW 17.10.160 - Right of Entry).

S4.B.4. Larvicides

The larvicide use conditions included in the 2010 Permit are largely unchanged from the permit issued in 2007. Ecology made one substantive change. Ecology removed the permit condition that authorized the use of new active ingredients not included in the issued permit for three reasons:

- Adding new active ingredients to an issued permit is a major modification of the permit conditions. Ecology must notify the public when it issues major modifications using a public involvement process (173-226-230 WAC).
- Since Ecology issued the first Permit in 2002, it has not added any active ingredients to the permit at the request of Permittees outside the permit development process. If Permittees request additional active ingredients after issuance of the proposed 2015 Permit, they must request that Ecology re-open and modify the existing permit to include those active ingredients. Inclusion of new active ingredients will depend on Ecology review of the literature available about the specific active ingredient.
- Ecology does not currently have the resources to review risk assessments outside of the permit development process.

S4.B.5 Adulticides

These requirements are intended to limit the indirect discharge of adulticides to water bodies in Washington. Adulticides are toxic to aquatic life, so by limiting discharges, aquatic life is protected.

S4.B.6 Vulnerable Species

Ecology has determined that certain endangered, sensitive, threatened or candidate species have the potential to be impacted by discharge of chemicals allowed under the permit. To reduce these potential impacts Ecology worked with WDFW to develop the “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species” document.

Areas identified by WDFW in the “Areas of Restricted Larvicide and Adulticide Use Due to Presence of Vulnerable Species” document, found on the Aquatic Mosquito Control NPDES General Permit website, have additional planning and approval conditions to ensure that vulnerable species are protected.

Permittees that do not wish to be restricted to Bacillus based products when conducting mosquito control treatments in areas identified as containing vulnerable species must satisfy additional planning and approval requirements. For a permittee to treat with non-Bacillus based products they must provide a plan for review and approval by Ecology that discusses how treatments will occur in vulnerable species habitat areas. Ecology will not approve the plan without concurrence from WDFW and the affected land management agency, if one exists.

S4.C Experimental Use Permits

EPA regulates federal EUP’s under section 5(f) of FIFRA and WSDA regulates both state and federal EUP’s under RCW 15.58.405(3). Entities operating under a state EUP do not need coverage under the Aquatic Invasive Species Management Permit because state EUP’s are limited in acreage. However, entities operating under a federal EUP must obtain permit coverage. Federal EUP’s typically allow treatment of up to several hundred acres.

S5. INTEGRATED PEST MANAGEMENT PLAN

The sections required to be included in an IPM plan are drawn from EPA’s Pesticides General Permit, Section 5 titled “Pesticide Discharge Management Plan” to ensure that the same information required by EPA is included.

S6. PUBLIC NOTIFICATION AND POSTING REQUIREMENTS

The intent of any public notice is to make the public aware of activities taking place that may affect them. For various reasons, individuals in communities wish to limit their exposure to pesticides. For example, some individuals may need information due to chemical sensitivity, others because of lifestyle choices. All members of the public have the right to know when they are exposed to chemicals, so they can make informed decisions about limiting their exposure. The intent of this section of the permit is to inform the public of pesticide use for mosquito control.

Ecology adopted the requirements for public notice, posting, and legal notice of pesticide applications from previous public notification requirements in Ecology-issued orders and short-term modifications. In some cases, Ecology based the public notification requirements on EPA FIFRA label requirements. In all other cases, Ecology based the requirements on its best professional judgment and the public’s right to know.

The draft permit requires applicators to post notices at all reasonable points of ingress and egress to the treatment areas when applying larvicides with water use restrictions to water bodies that are used for water supply, fish and shellfish harvesting, or water contact activities. Permittees must also make adulticide application area maps available to the public.

S7. MONITORING

RCW 90.48.260 gives Ecology the authority to establish inspection, monitoring, entry, and reporting requirements. WAC 173-220-210 gives Ecology the authority to require monitoring of treated waters to determine the effects of discharges on surface waters of the state. With the exception of certain parameters (pH, temperature, alkalinity), Ecology requires that all monitoring data be analyzed and prepared by a laboratory registered or accredited for the active ingredient under the provisions of chapter 173-50 WAC, *Accreditation of Environmental Laboratories*.

WAC 173-220-210 gives Ecology the authority to require monitoring of the treated waters to determine the effects of discharges on surface waters of the state. Permittees with coverage under the permit must record the amount of pesticides they use and report the pounds of active ingredient used and the acreage treated to Ecology in an annual report. In addition, for larvicide use, the Permittee must take dip samples to ensure there are mosquito larve present before treating.

S8. REPORTING

This section contains specific conditions based on Ecology's authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-226-090).

S8.A Annual Treatment/Monitoring Reports

Permittees meet part of their reporting requirements through annual treatment reporting. Permittees must submit their annual treatment report by December 31 of each year. The annual report summarizes the amount of each active ingredient (in pounds) used during the course of each treatment season per coverage. Reporting allows Ecology to track how much pesticide Permittees use in Washington for a specific use. Annual reporting also allows Ecology to determine if aquatic pesticide use for mosquito control is increasing or decreasing.

S8.B Records Retention

Ecology based this permit condition on its authority to specify any appropriate reporting and recordkeeping requirements to prevent and control waste discharges (WAC 173-226-090). Permittees must keep all records and documents required by this permit for five years. If there is any unresolved litigation regarding the discharge of pollutants by the Permittee, they must extend the period of record retention through the course of the litigation (WAC 173-226-090).

S8.C Public Request for Plans

Plans that are required as part of the permit must be available for the public to review because they are part of the controls that help limit the discharge of larvicides and adulticides to water bodies in Washington.

S8.D Noncompliance Notification

WAC 173-226-080(1)(d) states that a discharge of any pollutant more frequently or at a level in excess of that authorized is a permit violation. Ecology requires that if a Permittee violates permit conditions, it must take steps to stop the activity, minimize any violations, and report those violations to Ecology. For pesticide applications authorized in the permit, applicators must report violations to the Aquatic Pesticide Permit Manager and the Regional Spills Hotline (ERTS Hotline) within 24 hours. This allows Ecology to determine if more action is necessary to mitigate the permit violation.

S9. APPENDICIES

The appendicies generally contain supporting information for the implementation and understanding of the permit. Appendicies are incorporated into the permit requirements by reference.

GENERAL CONDITIONS

Ecology bases the General Conditions on state and federal law and regulations.

DUTY TO REAPPLY

All NPDES permits require Permittees to reapply for coverage 180 days prior to the expiration date of the general permit in accordance with 40 CFR 122.21 (d), 40 CFR 122.41(b), and WAC 183-226-220(2).

PERMIT ISSUANCE PROCEDURES

PERMIT MODIFICATIONS

Ecology may modify this permit to impose new or modified numerical limits, if necessary to meet Water Quality Standards for Surface Waters, Sediment Quality Standards, or Water Quality Standards for Ground Waters, based on new information obtained from sources such as inspections, effluent monitoring, or Ecology approved engineering reports. Ecology may also modify this permit because of new or amended state or federal regulations.

RECOMMENDATION FOR PERMIT ISSUANCE

The general permit meets all statutory requirements for authorizing a wastewater discharge, including those limits and conditions believed necessary to control toxics, protect human health, aquatic life, and the beneficial uses of waters of the State of Washington. Ecology proposes to issue this general permit for five (5) years.

APPENDIX A: DEFINITIONS

All definitions listed below are for use in the context of this permit only.

Active Ingredient(s):

The substance or substances in a pesticide product that causes the desired toxic biological effects. See Pesticide product and Toxic.

Action Threshold:

The density of, or number of individuals in, a pest population that triggers management activities.

Adulticide:

A pesticide designed to kill adult mosquitoes. See Pesticide.

All known, available, and reasonable methods of pollution control, prevention and treatment (AKART):

A technology-based approach of engineering and economic decision-making for limiting pollutants from discharges. AKART represents the most current methodology for preventing, controlling, and abating pollution that can be reasonably installed or used at a reasonable cost. Described in chapters 90.48 and 90.54 RCW and chapters 173-201A, 173-204, 173-216 and 173-220 WAC. See Discharge and Pollutant.

Applicant:

The entity who seeks coverage under this permit by submitting a completed notice of intent and all required supporting materials to the Washington State Department of Ecology. See Entity, Notice of intent, and Permit.

Application for Coverage (same as Notice of intent):

A formal request for coverage under this general permit using the paper or electronic form developed by the Washington State Department of Ecology for that purpose. See General Permit.

Applicator:

An individual licensed to apply pesticides by the Washington Department of Agriculture under Chapter 17.21 RCW and Chapter 16-228 WAC. See Pesticide.

Best Management Practices (BMP):

Activity, prohibition, maintenance procedure, or other physical, structural, and/or managerial practice to prevent or reduce pollution of and other adverse impacts to the waters of Washington State. BMPs include treatment systems, operating schedules and procedures, and practices used singularly or in combination to control plant site runoff, spillage or leaks, sludge or waste disposal, and drainage from raw material storage. BMPs may be further categorized as operational source control, erosion and sediment control, and treatment BMPs. See Waters of the State of Washington.

Code of Federal Regulations (CFR):

The codification of the general and permanent rules published in the Federal Register by the executive departments and agencies of the Federal government.

Discharge (the noun form is the same as Effluent):

1. To release or add material (e.g. pollutant) to waters of the State of Washington.
2. The material discharged, including surface runoff that has been collected or channeled by man.

See Waters of the State of Washington.

Entity (same as Party):

Any person or organization, including, but not limited to: cities, counties, municipalities, Indian tribes, public utility districts, public health districts, port authorities, mosquito control districts, special purpose districts, irrigation districts, state and local agencies, companies, firms, corporations, partnerships, associations, consortia, joint ventures, estates, industries, commercial pesticide applicators, licensed pesticide applicators, and any other commercial, private, public, governmental, or non-governmental organizations, or their legal representatives, agents, or assignees. See Applicator and Pesticide.

For the aquatic mosquito control permit, the party must have operational control of mosquito control pesticide applications.

Experimental Use Permit:

Federal or state permit that allows the use of a currently unregistered pesticide or a new use of a registered pesticide in the context of a research and development effort for registration of that pesticide or of a new use of that pesticide under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) Section 3. See Federal Insecticide, Fungicide, and Rodenticide Act and Permit.

Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA):

The federal law that set up the basic U.S. system of pesticide regulation to protect applicators, consumers, and the environment through establishment of regulations that require uniform pesticide product labeling, use restrictions, and review and labeling of new pesticides (7 U.S. Code Section 136 et seq. as amended). See Applicator and Pesticide product.

General Permit:

A single permit that covers multiple characteristically similar dischargers of a point source category within a designated geographical area, in lieu of many individual permits that are issued separately to each discharger. See Permit.

Indirect Discharge:

The purposeful application of a pesticide product to an area where incidental overspray, drift, or dripping of the pesticide product into waters of the state is likely, but not intentional.

Indian Country:

Means as defined in 18 USC 1151: “Except as otherwise provided in sections 1154 and 1156 of this title, the term ‘Indian country’, as used in this chapter, means (a) all land within the limits of any Indian reservation under the jurisdiction of the United States Government, notwithstanding the issuance of any patent, and, including rights-of-way running through the

reservation, (b) all dependent Indian communities within the borders of the United States whether within the original or subsequently acquired territory thereof, and whether within or without the limits of a state, and (c) all Indian allotments, the Indian titles to which have not been extinguished, including rights-of-way running through the same.”

Integrated Pest Management (IPM):

An approach for managing the selection and use of pest control activities, either singly or in an coordinated decision-making strategy. The elements of integrated pest management include: (1) Pest prevention activities; (2) Monitoring for the presence of pests, pest density, and pest damage; (3) Setting action thresholds based upon a cost/benefit analysis of potential health, public safety, economic, or aesthetic effects of pests on the interests of producers, society, and the environment to determine whether pest control activities must take place; (4) Selecting pest control activities using a strategy that may employ biological, cultural, mechanical, and chemical control methods; and (5) Evaluating the effectiveness of pest control activities. See Pest.

Integrated pest management plan (IPM Plan):

A plan that documents the system for implementing integrated pest management. See Integrated pest management.

Jurisdiction:

1. The practical authority granted to a formally constituted legal body to deal with and make pronouncements on legal matters and, by implication, to administer justice within a defined area of responsibility.
2. The geographical area or subject-matter to which such practical authority applies.

Larvicide:

A pesticide designed to kill mosquitoes during their larva and pupa life stages. See Pesticide.

National Pollutant Discharge Elimination System (NPDES):

The Federal wastewater permitting system for discharges of pollutants from point sources to the navigable waters of the United States authorized under Section 402 of the Clean Water Act. The U.S. Environmental Protection Agency has authorized the State of Washington to issue and administer NPDES permits for non-Federal point sources within the State. See Discharge and Pollutant.

Notice of Intent (NOI):

A formal application or request for coverage under this National Pollutant Discharge Elimination System general permit pursuant to WAC 173-226-200. See Application for coverage, General permit, and National Pollutant Discharge Elimination System.

Notice of Termination (NOT):

A request for termination of coverage under this general permit. See General permit.

Permit:

An authorization, license, or equivalent control document issued by a formally constituted legal body, such as the Washington State Department of Ecology, to a facility, activity, or entity to treat, store, dispose, or discharge materials or wastes, specifying the waste treatment and control requirements and waste discharge conditions. Unless the context requires differently, “permit”

refers to individual and general permits authorized under the National Pollutant Discharge Elimination System program. See Discharge, Entity, General permit, National Pollutant Discharge Elimination System and Treatment.

Permittee:

The entity that has applied to Ecology and been issued coverage under this general permit for a discharge of pollutants to waters of the State of Washington. Each general permit may have specific requirements describing who is eligible to be a Permittee. See Discharge, Entity, General permit, Pollutant, and Waters of the State of Washington.

Pest:

Any annoying, harmful, or injurious organism; any organism normally considered to be annoying, harmful, or injurious; or an organism that the Director of the Washington State Department of Agriculture declares to be a pest. Examples include nematodes, insects, snails, slugs, rodents, weeds, and certain microorganisms and viruses. Viruses, bacteria, parasites, and other microorganisms are not considered pests for this permit if they are found on or in a living person or other animal or on or in processed food, beverages, or pharmaceuticals.

Pesticide:

Any substance or mixture of substances intended to prevent, destroy, control, repel, or mitigate any pest; to be used as a plant regulator, defoliant, or desiccant; or to be used as an adjuvant with a pesticide. See Pest.

Pesticide Product:

The set of active, inert, and other ingredients specific to a pesticide formulation for which a Federal Insecticide, Fungicide, and Rodenticide Act label is available. See Federal Insecticide, Fungicide, and Rodenticide Act; and Pesticide.

Pesticide Resistance:

Adaptation of a pest to a specific pesticide that results in reduced efficacy on the target pest. See Pesticide.

Pollutant (in water):

Any discharged substance or pathogenic organism that would: (1) Alter the biological, chemical, physical, radiological, or thermal properties of any water of the State of Washington, (2) Would be likely to create a nuisance or render such water harmful, detrimental, or injurious (a) to the public health, safety, or welfare, (b) to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or (c) to any animal or plant life, either terrestrial or aquatic, either directly from the environment or indirectly by ingestion through the food chain.

Pollutants may include, but are not limited to, the following: solid waste, incinerator residue, garbage, sewage, sewage sludge, filter backwash, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, dredged spoil, rock, sand, cellar dirt, and other industrial, municipal, and agricultural wastes.

See Discharge, Permit, Pollutant and Waters of the State of Washington.

Sponsor:

For the aquatic plant and algae permit, an individual or a private or public entity who has: (1) A vested or financial interest in the treatment of aquatic plants and algae in a particular water body; and (2) The authority to administer common areas of the water body or locations within the water body for the purposes of aquatic plant and algae management. Entities with this authority include Lake Management Districts formed under Chapter 36.61 RCW, Special Purpose Districts formed under Title 57 RCW, Homeowners Associations formed under Chapter 64.38 RCW, and groups operating under the provisions of Chapter 90.24 RCW. Other entities may also have the authority to manage common areas in public or private water bodies. Typically the sponsor retains a licensed applicator to apply pesticides for aquatic plant and algae management. For treatment on individual lots, the sponsor must have the authority to contract for aquatic plant and algae management within the lot boundaries. See Applicator, Entity, Permit, Pesticide, and Treatment.

Surveillance:

The use of pest monitoring techniques to determine when pest populations have reached a level at which treatment is desired. See Pest and Treatment.

Toxic:

Causing death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformations in any organism or its offspring upon exposure, ingestion, inhalation, or assimilation.

Treat:

To intentionally apply a pesticide or other chemical to the water, vegetation, air, or soil to control or kill a target organism or species; to remove or inactivate bioavailable phosphorus; or to regulate some other ecosystem process.

See Pesticide and Pollutant.

Treatment:

The intentional application of a pesticide or other chemical to the water, vegetation, air, or soil to control or eradicate a target organism or species; to remove or inactivate bioavailable phosphorus; or to regulate some other ecosystem process.

See Pesticide and Pollutant.

Upland farm pond:

Private farm ponds created on upland sites that did not incorporate natural water bodies (WAC 173-201A-260(3)(f)).

Washington Pesticide Control Act:

Chapter 15.58 Revised Code Washington (RCW)

Waters of the State of Washington:

All waters within the geographic boundaries of the State of Washington defined as “waters of the United States” in 40 CFR 122.2, and all waters defined as “waters of the state” in RCW 90.48.020. These waters of the state include lakes, rivers, ponds, streams, inland waters, wetlands, marine waters, estuaries, underground waters, and all other fresh or brackish waters and water courses within the jurisdiction of the State of Washington, plus drainages to those surface waters. See Jurisdiction and Waters of the United States.

Waters of the United States:

All waters defined as “waters of the United States” in 40 CFR 122.2. See Code of Federal Regulations.

In the absence of other definitions set forth herein, the definitions set forth in 40 CFR Part 403.3 or in chapter 90.48 RCW apply.

APPENDIX B: BIBLIOGRAPHY

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63. Chapter 17.28 RCW: Mosquito control districts
64. Chapter 43.21C RCW: State environmental policy
65. Chapter 90.48 RCW: Water pollution control

TECHNICAL RESOURCES (LABELS AND MSDS)

66. Abate:
http://www.clarke.com/index.php?option=com_content&view=category&layout=blog&id=78&Itemid=156#anvil
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http://www.clarke.com/index.php?option=com_content&view=category&layout=blog&id=78&Itemid=156#anvil
68. Di-Brom: http://www.amvac-chemical.com/dibromcon_labels.html
69. Permanone:
http://www.bayerprocentral.com/bayer/cropscience/backedbybayer.nsf/id/EN_Vector_Labels_MSDS
70. Pyroicide: <http://www.mgk.com/Professional-Pest-Control/Fogging%20Concentrates/Pyroicide-100.aspx>
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http://www.bayerprocentral.com/bayer/cropscience/backedbybayer.nsf/id/EN_Vector_Labels_MSDS
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76. Chapter 173-204 WAC: Sediment Management Standards

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78. Chapter 173-226 WAC: Waste discharge general permit program

79. Chapter 197-11 WAC: State environmental policy act (SEPA) Rules

APPENDIX C: PUBLIC INVOLVEMENT INFORMATION

In order to be considered, all comments about the proposed permit must be received by 5 p.m. on April 17, 2015 (45 days from the date of public notice)

Ecology has tentatively determined to reissue the Mosquito Control General Permit to mosquito control activities as identified in Special Condition S1., Permit Coverage. The proposed permit will replace the current permit.

Ecology will publish a Public Notice of Draft (PNOD) on March 4, 2015, in the Washington State Register. The PNOD informs the public that the draft permit and fact sheet are available for review and comment.

The notice will also be mailed to those who currently have coverage under the Aquatic Mosquito Control General Permit and those identified as interested parties.

Copies of the draft general permit, fact sheet, and related documents are available for inspection and copying between the hours of 8 a.m. and 5 p.m. weekdays, by appointment, at the Ecology's headquarters office listed below, or may be obtained from Ecology's website, or by contacting Ecology by mail, phone, fax, or email.

Permit Website:

http://www.ecy.wa.gov/programs/wq/pesticides/final_pesticide_permits/mosquito/mosquito_index.html

Ecology Headquarters Building Address:
300 Desmond Drive
Lacey, WA 98503

Contact Ecology:

Department of Ecology
Water Quality Program
Attn: Aquatic Pesticide Permit Manager
PO Box 47696
Olympia, WA 98504-7696

Nathan Lubliner
Email: nathan.lubliner@ecy.wa.gov
Phone : (360) 407-6563
Fax: (360) 407-6426

Submitting Written and Oral Comments

Ecology will accept written comments on the draft Mosquito General Permit and Fact Sheet.

Ecology will also accept oral and written comments at the public hearings at the locations and times listed below.

Comments should reference specific permit conditions or sections of text when possible. Comments may address the following:

- technical issues,

- accuracy and completeness of information,
- the scope of facilities proposed for coverage,
- adequacy of environmental protection and permit conditions, or
- any other concern that would result from issuance of the revised permit.

Ecology prefers comments be submitted by email to: nathan.lubliner@ecy.wa.gov. Ecology must receive written comments via email or postmarked no later than 5 pm on April 17, 2015.

Submit written, hard copy comments to:

Nathan Lubliner
 Department of Ecology
 PO Box 47696
 Olympia, WA 98504-7696

You may also provide oral comments by testifying at the public hearing. Written and oral comments will receive the same consideration.

Open House, Workshop and Public Hearing

The workshops and public hearings on the draft general permit will be held at the locations below. The purpose of the workshop is to explain the general permit, and answer questions in order to facilitate meaningful testimony during the hearing. The purpose of the hearing is to provide an opportunity for people to give formal oral testimony and comment on the proposed permit.

Open House, Workshop and Public Hearing Locations

Kennewick:

April 7, 2015, 1 p.m.
 Benton PUD Auditorium
 2721 West 10th Avenue
 Kennewick, WA

Moses Lake:

April 8, 2015, 1 p.m.
 Moses Lake Fire Station 1
 701 E. Third Avenue
 Moses Lake, WA

Longview:

April 9, 2015, 1 p.m.
 Cowlitz Regional Conference Center
 1900 7th Avenue
 Longview, WA

Issuing the Final Permit

Ecology will make a determination whether to issue the final permit after it receives and considers all public comments. Ecology expects to make a decision on issuing the new general permit in spring 2015. It will be effective one month after the issuance date.

For further information, contact Nathan Lubliner at nathan.lubliner@ecy.wa.gov, or (360) 407-6563, or by writing to Ecology at the Olympia address listed above.

APPENDIX D: APPEAL

This permit may be appealed to the Pollution Control Hearings Board (PCHB) within 30 days of the date of receipt of the final permit. The appeal process is governed by chapter 43.21B RCW and chapter 371-08 WAC. "Date of receipt" is defined in RCW 43.21B.001(2) (also see glossary).

To appeal, the following must be done within 30 days of receipt of this permit:

- File the appeal and a copy of this permit with the PCHB (see addresses below). Filing means actual receipt by the PCHB during regular business hours.
- Serve a copy of the appeal and this permit on Ecology in paper form - by mail or in person (see addresses below). **E-mail is not accepted.**

The appeal must also comply with other applicable requirements in chapter 43.21B RCW and chapter 371-08 WAC.

ADDRESS AND LOCATION INFORMATION

Street Address

Department of Ecology
Attn: Appeals Processing Desk
300 Desmond Drive SE
Lacey, WA 98503

Pollution Control Hearings Board
1111 Israel RD SW
Suite 301
Tumwater, WA 98501

Mailing Address

Department of Ecology
Attn: Appeals Processing Desk
PO Box 47608
Olympia, WA 98504-7608

Pollution Control Hearings Board
PO Box 40903
Olympia, WA 98504-0903

APPENDIX E: RESPONSE TO COMMENTS

Look for the Response to Comments document on the Aquatic Mosquito Control General Permit web page:

http://www.ecy.wa.gov/programs/wq/pesticides/final_pesticide_permits/mosquito/index.html