

March 16, 2010

Mr. Jon Jennings
Aquatic Pesticides and CAFOs
Water Quality program
Washington State Department of Ecology
P.O. Box 47600
Olympia, WA 98504

SUBJECT: Comments from Mosquito Control Districts

Dear Mr. Jennings,

Enclosed is a compilation of letters from Mosquito Control Districts of Washington State. Each District has a distinct geography and individual challenges, yet the ultimate goal is the same; to serve the citizens of the State of Washington by reducing mosquito populations. Thank you for the opportunity to comment on the Draft Aquatic Mosquito Control NPDES General Permit. We greatly appreciate the extra week that was granted by the Department of Ecology for additional public comment.

We hope that you will carefully consider the comments made by the Mosquito Control Districts as you finalize the permit. We request the opportunity to meet with members of your department again in mid-April to discuss any changes that are to be made. A meeting place of Ellensburg was suggested at the hearing in Moses Lake.

Washington has a long and successful history in mosquito control. The people have come to rely on our public services and our knowledgeable professionals. In the coming years as West Nile virus continues to spread throughout the state, and afterwards when the disease is endemic, it is increasingly important for Mosquito Control and Ecology to work together addressing the concerns of the citizens. Please feel free to contact any of the listed authors if you have questions regarding the submitted comments.

Sincerely,

Angela Balint

Angela Balint
Washington State Representative,
Northwest Mosquito and Vector Control Association

We need Adulticide to Prevent Epidemics

Washington State has had several outbreaks of mosquito transmitted disease. Malaria was even found in this state in the latter part of the 19th century and early part of the 20th. Before mosquito control districts were established these diseases were a problem. In fact, the first mosquito control districts were established because of these diseases. If one infected person travels into an area with a large vector population we can have the same problem again.

Reducing the mosquito population is the best way to insure that these diseases don't come back. Just because these diseases are no longer a problem here, is no reason to stop doing what has been most beneficial to eradicate these diseases in Washington State. After all we still vaccinate our children for those diseases that really are no longer a problem.

You can't keep mosquito populations low enough with larvicide and habitat modification alone. In fact, large scale habitat modification is almost impossible these days and "mosquito fish" are not permitted in waters of Washington State. At some point each season every mosquito control district needs to use adulticide.

Most districts use only ground based adulticide. We have developed our programs so that adulticiding is at a minimum but it is still needed; not only for mosquitoes when they are carrying disease, but when they are multiplying to such a point that they can become a threat to human health. After all, it just takes one person returning from Africa or Asia with a mosquito transmitted disease to start an epidemic.

DOE must not prevent us from doing what we have always done to insure mosquito borne diseases are not readily transmitted in our state. The draft permit would essentially prevent us from doing any adult mosquito control until disease is well established. Waters of the state is defined too broadly. There is no way we can adulticide and still insure no residual is deposited in "waters of the state."

After disease is confirmed it is too late and this is entirely contrary to what health professionals have learned time and time again. *Don't wait until disease is confirmed. Keep mosquito populations low so that disease does not become established in the human population.* We need all the tools available to do this.

The following WA mosquito species are capable of transmitting or maintaining the following disease causing pathogens:

<i>Aedes vexans</i>	Canine heartworm, demonstrated laboratory transmission of Rift Valley fever
<i>Anopheles freeborni</i>	Malaria
<i>Anopheles punctipennis</i>	Canine heartworm
<i>Coquilletidia perturbans</i>	Eastern equine encephalitis
<i>Culex pipiens</i>	SLE, WNV
<i>Cx. tarsalis</i>	SLE, WNV, WEE
<i>Culiseta inornata</i>	WEE
<i>Ochlerotatus dorsalis</i>	WEE
<i>Oc. japonicus*</i>	Laboratory transmission of EEE, WNV and LaCrosse virus

<i>Oc. melanimon</i>	WEE
<i>Oc. sierrensis</i>	Canine heartworm
<i>Oc. sticticus</i>	WEE, SLE
<i>Oc. togoi</i> *	Brugian and Bancroftian filariasis, Japanese encephalitis

*Introduced, non-native species

Documented mosquito borne diseases here in WA: we have had West Nile, WEE, and SLE as well as canine heartworm. What appears to have been malaria showed up in 1830 around Fort Vancouver, WA and the surrounding Willamette valley area. Malaria was reported in the mid to late 1800s/early 1900s in Oregon. The historical reports from WA appear to be primarily travel-related, esp. post WWII. Old Army reports suggest that malaria was present in South Central WA, although those cases may have been brought in by traveling troops.

It can happen again. We must be allowed all our tools to insure public health is protected.

Del Gilkerson
Cowlitz County Mosquito Control

FRANKLIN COUNTY MOSQUITO CONTROL DISTRICT



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Monday, March 15, 2010

Subject: **Comment on the WA State DOE NPDES Draft Permit statement:**

Page 10 - S5- B- 3 – The trigger for Mosquito Adulticide will be Alert Level 3 in the West Nile Outbreak Response Plan. Alert Level 3 is by definition “Moderate Risk of Human Outbreak”. “Sustained mosquito-borne virus activity in birds or mosquitoes in the absence of human infections”.

Why waiting to reach Alert Level 3 before instituting Mosquito Adulticide measures is too late?

First some background:

What is the primary source that produces the mosquito species that are the primary vectors for transmitting mosquito-borne viruses to humans and other animals?

That primary source is wetlands. Wetlands do have advantages but they also have disadvantages and those disadvantages put humans at risk. Wetlands provide the perfect habitat for the mosquito species that vector mosquito-borne viruses. These habitats provide relatively shallow still water, high concentrations of vegetation that provide cover from predators and an abundant food source with decomposing and new vegetation growth. In addition it provides an abundant source of hosts for the blood meal that female mosquitoes need for reproduction. The primary host in a wetland for these mosquito species blood meals is birds. It is the birds who are the continuing reservoirs for the mosquito-borne viruses West Nile virus, St. Louis encephalitis and Western Equine Encephalitis (WNV, SLE, WEE). These mosquito-borne viruses have effects to humans and animals that range from mild to very grave including loss of life. Summing up, wetlands do present a serious set of problems and a great deal of human risk involved.

The best and most effective way to control/mitigate a problem is to control it at its source. To give you one example in The State of California: “California Wetlands Conservation Policy” Section VI- A and I will quote. “Address management and operations of wetlands- Recognizing that the responsibility for wetlands only begins with the acquisition or restoration, the State will work to provide adequate financial resources for wetlands management and operations including water source and delivery, mosquito abatement and vector control. The emphasis for these programs will be on State-owned wetlands.

The State also recognizes the responsibility public and private wetland owners have to their neighbors and will establish a model good neighbor policy to guide management of newly created, restored or enhanced”.

The State of California recognizes the mosquito disease problem and its risks and has worked with Mosquito Abatement District’s to form the **BEST MANAGEMENT PRACTICES FOR MOSQUITO CONTROL IN MANAGED WETLANDS**. These BMP’s are habitat management practices, water, vegetation, and infrastructure maintenance activities used in the State to mitigate the mosquito/vector problems and their risks.

Washington State: Washington State Wetland Policy makes no mention of mosquitoes, disease and the subsequent risk to humans they create. Since that is not in the policy the State of Washington have no mitigation policies to mitigate mosquito and disease problems and risk at the source. This is a grave oversight and needs to be addressed and instituted by the State...

Back to the question- Why waiting to reach Alert Level 3 before instituting Mosquito Adulticide measures is too late?

Both the EPA and CDC recommend and endorse applications of mosquito adulticides when surveillance indicates that mosquito larval control measures have proven inadequate to prevent imminent disease outbreaks. Wetlands produce the mosquito-borne disease vectors and here in Washington they are not managed and are congested with huge areas of dead and matted vegetation. This condition causes serious problems and risk. Mosquito Control District’s find that they cannot get the majority of their mosquito larvicide materials through the matted vegetation to kill mosquito larvae. Many times the District’s work to control mosquito larvae is inadequate leaving the District with the recourse of having to spray an insecticide to kill the adult mosquitoes that have emerged from the wetlands and other non-primary areas.

Mosquito Control District’s public trust cannot allow or wait for vector mosquito species to complete their disease transmission cycle development. District’s must keep the adult mosquito population numbers reduced to a level that lowers the chance for the disease transmission cycle development to occur to keep humans and animals at the lowest amount of risk. Waiting for Alert Level 3 to be reached allows the disease transmission cycle to occur in substantial mosquito populations. Mosquito Control District’s must quickly reduce adult mosquito populations where and when they are found. Waiting means having large disease carrying mosquito populations and having to institute mosquito spraying over considerable geographical areas to control them. In summation waiting for level 3 to occur before spraying insecticide for adult mosquitoes involves public risk that is unacceptable and indefensible in light of the facts.

Sincerely

Brian W. Benner

Brian W. Benner, Director

Smaller Districts and Reaching Alert Level 3

Requiring an alert level 3 before adulticiding is even considered is a frightening scenario to imagine to a small district. Smaller districts may lack the tools to track the progression of disease spread in mosquito populations. A Mosquito Control Districts main concern is for the public health. With the permit as written you are eliminating an important tool in our ability to minimize public health risks from mosquito diseases;

*A Permittee that is an organized mosquito control district (chapter 17.28 RCW) may use adulticides to control vector mosquitoes provided it: conducts mosquito surveillance, **mosquito disease testing**, monitors **other disease indicators (such as dead birds, equine disease cases, or human health cases)** and follows available DOH vector control guidance (e.g. the West Nile Outbreak Response Plan where the trigger for adulticiding is Alert Level 3).*

Mosquito disease testing is an important part of a mosquito control program. Many smaller districts such as mine lack the personnel, equipment, and funding to fully establish a disease surveillance and testing program. We rely on State and local health jurisdictions for help with disease testing services. With the current state of the economy help is not as readily available as it once was.

Not all mosquito control districts have the ability to quickly and easily establish that a mosquito-borne disease has in fact established itself in the local mosquito or bird population. These are usually the first indicators of a mosquito-borne disease presence. Although I am able to identify the species of mosquitoes in my traps I cannot determine if they are carrying a disease or not; several species of mosquitoes in Washington are vectors for a mixture of mosquito-borne diseases. With a lack of funding at the State Health Department I am only able to send two species for testing. There is also a lag time in test results; I'm afraid that by the time we are finding positive mosquito pools it would be too late to react with adulticide. People and horses would already have been infected; the only way we are going to realize we are at a level 3 is when we start seeing people and horses with the disease. In my district we don't own any adulticiding spray or fog equipment; we will either rely on outside vendors or county personnel to perform spray or fog applications of adulticide. Without the testing equipment needed for early detection of disease in the mosquito population a preemptive and rapid response will not be easy. We will have to react only after people and horses have become ill and the public health threat is beyond proactive control. Perhaps the Department of Ecology will offer Grants or other funding to help mosquito control districts purchase the needed equipment to adhere to permit guidelines.

Please rethink this part of the permit so that we will have the ability to react and treat mosquitoes with adulticides if needed before people become ill.

Jay Lawrence

District Manager

Camano Island Mosquito Control District

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360 387-8705

Allow Us to do What We Have Always Done to Safeguard Public Health

Mosquito Control Districts are asking the DOE to reword the permit in such a way that we can continue providing service to our taxpayers as we have in the past. Most of the districts have been in existence for decades and over this time have developed programs that rely heavily on larviciding but also use adulticides to respond when the public is overwhelmed by adult mosquitoes. No matter how hard we try, larvicide alone will not solve the whole problem. I'm sure the use of adulticides in the state has drastically decreased over time as the industry changes, but a well run integrated pest management program will always need adulticides at some point during the season.

The Mosquito Control Districts are professional programs with highly trained staff that respect the environment and always follow all labeled rules and guide lines. If the permit stands as drafted we will be forced to stop all adulticiding until disease is proved to be persistent in the environment. This will be too late for the health of citizens of the state. Additionally the lack of adulticide for control of nuisance mosquitoes will severely affect the quality of life and business economy in many parts of our state.

Our attorney, Pat Brock, has written to you informing you that "It is my opinion that if the draft language becomes final, it will be necessary that the Districts cease all applications targeting adult nuisance mosquitoes."

Adulticides are use routinely all over the country and have been used for many, many decades. I am unaware of any incidents where professionals, using adulticides as directed by the label and in accordance with the policies we have in place in our districts have cause harm to the environment. To my knowledge no other state will put such restrictions on the use of adulticides as this draft permit does.

Our mosquito control districts strictly follow the regulations imposed on us by the Washington State Department of Agriculture, *The Washington State Pest Control Act*, and by the manufacture's FIFRA approved label. We watch the wind speed and direction to prevent any drift over rivers, lakes and streams thought to be fish bearing. But even with these procedures it is impossible to comply with the draft permit and continue to use adulticide in our programs.

The problem is in the definition of "Waters of the State" and the distinction between nuisance and vector mosquitoes.

If the wording in the permit is changed as follows we will be able to continue to provide mosquito control as we have in the past.

S5. ADULTICIDE USE

1. The Permittee is authorized to discharge *incidental* amounts of adulticides and their residues to surface waters of the state during *mosquito control season*. The Permittee must limit incidental deposition to the extent possible **by strictly adhering to label directions**. Adulticides may not be used in Appendix B areas unless WDFW and Ecology approve the use.

2. **The mosquito control period**, April 1 to October 31 of the same year, is the only time incidental discharge is authorized. The Permittee may request an extension of this period in writing from Ecology if natural population control (die-off) after October 31 is not expected.

3. Mosquito Control Districts

A Permittee that is an organized mosquito control district (chapter 17.28 RCW) may use **adulticides to control mosquitoes provided it is just one part of an Integrated Pest Management program that also includes larval control and breeding source reduction and conducts mosquito surveillance, mosquito disease testing, and monitors other disease indicators (such as dead birds, equine disease cases, or human health cases)**

4. Areas without a Mosquito Control District

A Permittee that is not part of an organized mosquito control district (chapter 17.28 RCW) may **use adulticides to control mosquitoes** provided DOH makes the determination that adulticiding for mosquito control is necessary to protect public health due to an overriding public health concern.

In conclusion, we are not asking DOE to give us permission to do more than we have in the past. We are just asking DOE to reword the permit so that we can continue to work as we always have. If DOE believes we should change the way we operate and stop all adulticiding until we reach DOH Alert Level 3 we request that you give us the reasoning behind this and present us with evidence of where we have caused environmental problems in the past.

Del Gilkerson
Cowlitz County Mosquito Control

Comments to the draft Washington State “Aquatic mosquito control national pollutant discharge elimination system state waste discharge general permit “

I have recently reviewed the online version of the draft NPDES permit for mosquito control. During this review I was unable to locate a citation under allowable active ingredients for mosquito adulticides for the active ingredient etofenprox. This oversight is understandable since Etofenprox, under the trade name Zenivex E 20, is new to mosquito control. Zenivex was first presented to mosquito control in 2009.

Etofenprox is a pyrethroid ether, and as such, the chemistry is different than that of conventional pyrethroids. The Etofenprox molecule contains only carbon, hydrogen, and oxygen and does not contain side chains associated with some traditional pyrethroids that can cause skin sensitivity and respiratory irritation. Etofenprox has an extremely low avian and mammalian toxicity profile, rat oral LD50 value is >42,880 mg/kg, which is significantly lower than items commonly found in the household such as aspirin and caffeine. The EPA has given etofenprox a reduced risk classification.

The formulation of etofenprox is also unique among formulated pyrethroid mosquito adulticides. The Zenivex E20 product does not contain the synergist piperonyl butoxide (PBO) that is included in other pyrethroid mosquito products. Etofenprox controls mosquitoes at low application rates and as such the formula does not require PBO to control mosquitoes. This lack of PBO reduces the environmental load for PBO. Zenivex E20 is currently registered with the State of Washington.

Zenivex (etofenprox) offers the mosquito abatement districts in Washington State a reduced risk tool for use in the fight against disease carrying mosquitoes. I urge you to correct the oversight and place etofenprox among the mosquito adulticide choices that are listed in the draft permit.

Doug VanGundy
Director
Central Life Sciences
12111 Ford Rd
Dallas, Texas 75234

ADAMS COUNTY MOSQUITO CONTROL DISTRICT

The Subject: **Use Only ULV for Adulticiding**

Dear Jon Jennings,

This has to be a very hard task to rewrite this NPDES permit. One can only assume that those that are proposing some of these new ideas do not understand the total concept of what we do in mosquito control. I would like to comment of the use of only ULV for Adulticiding.

Some mosquito control districts have large areas and very populated cities and towns where the only way to control the adult mosquitoes is to fly thousands of acres at a time. Once disease is present in an area some of the applicators come to fly at least 15,000 to 20,000 acres a night. To do a good job and to stop the spread of disease they will apply adulticides for two to three consecutive nights barring good weather.

I do not have any big populated areas. My biggest town is 8,000 people. That may not be many people, but they are just as important because they are tax payers. The areas that I most usually fly will range from 50 to 250 acres. These major applicators will not come in and fly these small areas. In order for me to do my adult control measures, we use a conventional spray system. It uses more water and more pressure to get the drops smaller for adult control. It may not be quite as good, but it gets the job done and uses less product in the long run because I do not spray as many acres. Naled or Dibrom 8 is labeled for this use and it does a good job. If you read the label you will see that there are many vegetables and food crops on the label and they use a much higher rate of application than I am using for adult mosquito control.

Each mosquito district has special or different conditions tailored for their own areas. That's why we have BMP's and you are making it very difficult for us to do our job when the only way is your way and not the one that will fit our own needs.

Please reconsider and allow us to use the methods that work the best for each of our areas as long as the products are registered by EPA and we follow the label. Many areas that have standing water are not fish bearing nor does the water go any where. It should not only be important to protect the environment, but also to protect the Health of those that live and recreate in each of our areas. Thank you for your consideration in this matter.

Tom Haworth, Manager
PO Box 262
Othello, WA 99344

March 15, 2010

**Comments to Washington State Department of Ecology concerning the NPDES Draft Permit;
Clarification for the definition of "Waters of the State"**

Definition of Waters of the State

Waters of the state are referred to many times throughout the AQUATIC MOSQUITO CONTROL NPDES PERMIT DRAFT and the FACT SHEET. Definitions of Waters of the State are very vague and I would like to submit the following comments and questions.

In the "*Draft Aquatic Mosquito Control General Permit Fact Sheet*" page 29 paragraph titled "Geographic Area Covered" describes surface waters of the state; "Ecology defines surface waters of the state as "lakes, rivers, ponds, streams, inland waters, salt waters, wetlands, and all other surface waters and water courses within the jurisdiction of the state of Washington (90.48.020 RCW, 173-201A-020 and 173-226-030 WAC)." A definition is also given in the Glossary of the Fact Sheet; "**Waters of The State:** All surface and ground waters in Washington State as defined by chapter 90.48.020 RCW, 173-201A-020 WAC and 173-226-030 WAC including any future amendments of state law. Also includes drainages to waters of the state." The Glossary definition of ground water is; "**Ground Water:** means any naturally occurring water in a saturated zone of stratum beneath the surface of land or a surface water body."

I think most people know a basic definition of what lakes, rivers, ponds, streams, and salt waters are. However the terms **inland waters, wetlands, and all other surface waters and water courses** seems to indicate that any and all water is considered to be waters of the state even ground water "beneath the surface of land or a surface water body" according to your definition. I would like a better description, definition, and clarification of these terms; **inland waters, wetlands, and all other surface waters and water courses**. The issues I am concerned with about the adulticide restrictions relating to waters of the state are the restrictions this draft permit puts on nuisance adult mosquito control as well as the restrictions to vector mosquito control. You claim the permit does not restrict the use of adulticide for any mosquitoes as long as it doesn't inadvertently enter Waters of The State. Spray or fog drift is a function of the adulticides used in mosquito control and "waters of the state" are everywhere. I don't know where you would find an area in Washington that adulticide would ever be legal. Especially in Western Washington, you would be hard-pressed to find an area where there aren't any Waters of the State. The definitions and restrictions you describe in the NPDES documents will leave anyone performing adult mosquito control at risk for potential lawsuits.

How can a mosquito control program accomplish its directive to abate adult mosquitoes, nuisance or otherwise, without this permit to do so? You will be in effect preventing adult mosquito control in the State of Washington if you leave these restrictions in place.

Jay Lawrence
District Manager
Camano Island Mosquito Control District
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360 387-8705

Comments of Resident Use of Mosquito Control Products

Dear Mr. Jennings:

I do not envy the position you are in. Trying to draft an Aquatic Mosquito Control permit that balances the needs of the people with the needs of the environment must be truly daunting. I think we could all agree the less harm to the environment, the better. To that end, Mosquito Control Districts (MCD) should be allowed to continue spraying adult mosquitoes. Control districts are governmentally controlled and regulated agencies. They have to follow the rules you set. Private Citizens on the other hand can pretty much do as they want.

I can assure you people will do their own adult mosquito spraying once the MCD's stop. Anyone can buy a fogger. You can get them from the hand held size right up to a truck mounted unit. As for what you could spray from them? Anything. They wouldn't have to be calibrated to anyone's standard. No setbacks observed; no label requirements to follow. Mosquitoes will affect commerce in the outdoor recreation industry to name only one example. Before they lose revenue control measures will be taken. It's that simple.

As for adulticiding only vector species of mosquitoes. The number of people who know the difference between the Culex pipien (chief vector) and the Aedes vexans (chief nuisance) is very few indeed. People feel jeopardy when they are bit by any mosquito. The people who aren't afraid are annoyed. This brings us back to "do it yourself" control measures. In the final tally what will be best for the environment? A governmentally controlled agency or an unorganized group of amateurs wielding whatever they can get their hands on. Please let the MCD's help you protect the environment from the devastating effect of an unregulated private effort.

Thank you for your consideration.

Dana F Churchel

PO BOX 295
Castle Rock, WA 98611
Cowlitz County

GRANT COUNTY MOSQUITO CONTROL DISTRICT #1

March 16, 2010

Jon Jennings – Mosquito Control Permit Comments
Washington State Department of Ecology
Water Quality Program
P.O. Box 47600
Olympia, WA 98504

Dear Jon,

The current wording in the permit affects the entire community including local residents, tourism, economy, and industry. Tourism brings in a large amount of revenue to Washington State for activities ranging from river and lake recreation, golf courses, concerts, and sporting events to farmers markets and county fairs. People from all over enjoy visiting our beautiful state for these types of activities and many more. Without adequate adult mosquito control, these luxuries would not exist; severely impacting both the state and local economies within Washington.

For example, the City of Moses Lake in Grant County relies heavily on tourism from its outdoor attractions. Some of these attractions include the lake itself, the sand dunes, the Surf 'n Slide Water park, the farmer's markets, and the Grant County Fair. These outdoor activities would be impossible to enjoy if it were not for the adult mosquito control of all mosquito species. Without adult mosquito control, the economy in Moses Lake will negatively be affected, hurting the local community that relies heavily on tourism to survive.

The nation's economy is already struggling to meet the demands of its people. Do not make Washington worse off by forcing people to travel out of the state to spend their recreation time and money.

I ask you to take the state and local economics into consideration when finalizing the NPDES permit for aquatic mosquito control. If it were not for adult mosquito control targeting all mosquito species, communities such as the City of Moses Lake and many others would not exist.

Thank you,

Ann T. Moser

Ann T. Moser

Vector Ecologist/Field Supervisor

Comments: Nuisance Mosquitoes and Livestock

Benton County Mosquito Control District is home to a wide variety of livestock and pets. The draft permit does not appear to consider the impact that “nuisance” mosquitoes have upon pets and livestock. These impacts can be economic, physical and overall well being of the animal. Nuisance mosquitoes in general are difficult to avoid, but for animals the options for minimizing impacts are far fewer.

Articles discussing the impact of “nuisance” mosquitoes are not readily available or easily found. Below is a collection of relevant excerpts from books, journal and University publications addressing the impact of mosquitoes upon livestock.

Species that are mentioned in the articles can be found within Washington State and Benton County Mosquito Control District.

Upon completion of reviewing these articles, I believe that it will be clear that mosquitoes (nuisance and vectors) pose a threat to the well being of animals even with an absence of actual disease transmission.

1. **Chapter 4; Biting Flies** (P. J. Scholl, Livestock Insects Laboratory, USDA-SEA_AR & J. J. Peterson, Livestock Insects Research Unit, USDA-SEA-AR Department of Entomology): “Until recently, the effects of mosquitoes on livestock was generally overlooked. Current estimates of production losses to the US cattle industry because of mosquito feeding exceed \$38 million annually. Swine, sheep, and poultry are other types of livestock subject to seasonal mosquito attack.”

Chapter 11; Arthropod Pests of Beef Cattle on Pasture or Range Land (R. E. Wright, Dept of Entomology, Oklahoma State University): “Most people regard mosquitoes to be primarily pests of humans, but many are serious pests of range cattle. The species complex that are livestock pests in any geographical area are different, although in most, the floodwater mosquitoes (*Aedes* and *Psorophora*) are the most important.”

“Mosquito-caused losses to cattle are due to blood loss and irritation, both of which can be significant when mosquito populations are very large.”

Chapter 13; Arthropod Pests of Dairy Cattle (E. T. Schmidtman, Livestock Insects Laboratory, USDA-SEA-AR): “The summer-active species affecting pastured cows and heifers are horn flies, face flies and the blood-sucking mosquitoes, black flies, horse and deer flies and biting midges. In feeding, these insects induce irritation and annoyance, cause blood loss, and may expose hosts to disease-causing agents. All or any of these factors may reduce conversion efficiency, suppress weight gain, or reduce milk yield.”

“...pastured cattle represent an attractive source for blood for host-seeking females, and there is every reason to believe that many dairy cattle, especially those grazed on poorly drained pastures, are exposed to high levels of mosquito attack.”

“Studies, however, demonstrated that beef cattle on a maintenance feed ration and exposed to heavy mosquito attack gained weight at a slower rate than cattle protected from attack.”

Chapter 14; Arthropod Pests of Swine (R. E. Williams, Department of Entomology, Purdue University): “Mosquitoes, which breed in standing water around hoglots and in waste lagoons, can cause great annoyance to animals by their biting activities. They can also serve as vectors of various swine diseases.”

Chapter 15; Arthropod Pests of Sheep (J. E. Lloyd, Entomology Section, University of Wyoming): “...mosquitoes... These flies can be severely annoying and may affect the performance of sheep. They hinder grazing and cause sheep to run or to bunch up to be freed from annoyance. Biting or blood-sucking flies can remove much blood and may transmit organisms that cause disease.”

“Species of *Aedes* found to attack sheep in an inundated area of Wyoming included...*A. dorsalis* (Meigen)...”

“*Culiseta inornata* (Williston) is a species that is widespread in North America and is known to feed on large mammals, such as cattle and horses. Recently it has been discovered that this species will readily attach sheep.”

Chapter 16; Arthropod Pests of Poultry (R. C. Axtell, Department of Entomology, North Carolina State University): “...overwhelmingly, the mosquitoes in poultry waste lagoons are *Culex quinquefasciatus* Say in the southern (warm) regions and *Culex pipiens* Linnaeus in the northern (cool) regions. These mosquitoes will feed on humans and a wide variety of animals, including poultry. They transmit fowlpox.”

Chapter 17; Arthropod Pests of Horses (F. W. Knapp, Department of Entomology, University of Kentucky): “Mosquitoes can feed on horses in great numbers. The annoyance and blood loss from such feeding produces significant losses, and, sometimes, death. Mosquitoes are, however, of greater importance because of their role as vectors of equine infectious anemia, eastern equine encephalitis (EEE), St Louis encephalitis (SLE), western equine encephalitis (WEE), and Venezuelan equine encephalitis (VEE).”

“Mosquitoes on horses are important in every region of the United States and can cause severe blood loss and annoyance. In some areas, literally thousands of mosquitoes feed upon a horse during a single 24-hour period. Populations may be so heavy that they clog the nostrils of the animals. The species of mosquitoes attacking horses vary in different regions of the country, but the main genera consist of *Aedes*, *Culex*, *Anopheles* and *Psorophora*.”

R. E. Williams, et al. 1985, John Wiley & Sons, Inc. *Livestock Entomology*. Pgs 55, 196, 197, 224, 230, 231, 245, 254, 255, 293, 301 and 302.

2. "The annual loss to cattle production due to mosquito attack in the United States was estimated at \$25,000,000 in 1965 of which \$15,000,000 was attributed to reduction in weight gains and \$10,000,000 to reduction in milk production (189)."

"Mosquitoes are known to transmit vesicular stomatitis (49), filarial nematodes (164), Wesselborn virus (193), Ross River virus, Geah virus, Sindbis virus, Murray Valley Encephalitis, and Kunjia virus (157) to domestic animals."

C. Dayton Steelman. 1976. Effects of External and Internal Arthropod Parasites on Domestic Livestock Production. Pgs 155 & 164.

3. 9.4 BENEFITS OF MOSQUITO CONTROL

"Broadly speaking, the benefits of mosquito control can be divided into three classes: nuisance benefits, economic benefits, and public health benefits. Nuisance benefits include relief to people around homes or in parks and recreational areas. Nuisance benefits can even be said to extend to pets and to wildlife. Economic benefits include increased real estate values, enhanced tourism and related business interests, or increased livestock or poultry production. Public health benefits include the reduction of infectious disease agents."

Florida Coordinating Council on Mosquito Control. 2009. Florida Mosquito Control (white paper). Page 150.

4. For a period of approximately 7 weeks, *A. sollicitans* was present in such numbers that outdoor activity in the affected area was intolerable."

"...our observations of the cattle of the Gulf Area, and subsequent reports from mosquito-control and agricultural workers, indicated that the cattle did not regain their strength and flesh rapidly after extended mosquito trouble and entered the winter of 1962 in below-normal condition."

"Conservative estimates of financial losses on 50,000 head of cattle by cattlemen in Jefferson County, Tex., at the time of our July 1962 survey, are as follows: (1) A 10-pound weight loss per head, at \$0.25 per pound, \$125,000; (2) 200 deaths of adult cattle, at \$125 each, \$25,000; (3) 500 deaths of calves, at \$50 each, \$25,000; and (4) pasturage lease and trucking for 2,000 head, at \$15 each, \$30,000. These amounts total \$205,000. This total, of course, does not include the cost of additional labor, veterinary fees, losses on calves sold before the normal time, future effects on the animals, and other intangible effects."

R. A. Hoffman and W. C. McDuffie. 1962. The 1962 Gulf Coast Mosquito Problem and the Associated Losses in Livestock. Entomology Research Division, Agric. Res. Serv., USDA. Pgs 423-424.

5. "During a 2-year study (1969-70), *Psorophora ferox* (Lynch-Arribalzaga), *Anopheles quadrimaculatus* Say, *A. crucians* Wiedemann populations caused statistically significant and economically damaging reductions in the average daily gain of feedlot steers."

C. D. Steelman, T. W. White, and P.E. Schilling. Effects of Mosquitoes on the Average Daily Gain of Feedlot Steers in Southern Louisiana. Journal of Economic Entomology, Vol. 65, no. 2. Pg 462.

6. Animal Response and Economic Losses

“Cattle under heavy mosquito attack will bunch and spend time fighting mosquitoes instead of grazing. Steelman (1979) reported weight gain reductions of 0.04 kg/day/steer with heavy mosquito infestations.”

J. B. Campbell. 2003. Livestock Insects – Cattle. High Plains IPM Guide, a cooperative effort of the University of Wyoming, University of Nebraska, Colorado State University and Montana State University. Pg

7. “Although disease transmission is the most commonly cited reason for considering mosquitoes to be a public health problem, the presence of large numbers of biting pests will influence the physical and mental well-being of most people. Mosquitoes also cause economic loss to livestock as a result of blood loss and irritation. In addition, mosquitoes can reduce recreation activities that can result in a loss of tourist income and can depress property values on land adjacent to areas where they breed.”

J. D. Hopkins, M. V. Meisch. Developing a Community Mosquito Abatement Program. University of Arkansas, Division of Agriculture; FSA7060. Pg 1.

8. “Arthropod pests limit production in the beef cattle industry by affecting animals in many ways. External parasites are the most serious threat since they feed on body tissues such as blood, skin and hair. The wounds and skin irritation produced by these parasites often result in discomfort and irritation for the animal. More significant, however, is that any blood-sucking arthropod may transmit diseases from infected animals to healthy ones. In addition, arthropod pests also may reduce weight gains, cause losses in milk and meat production, produce general weakness, cause mange and severe dermatitis, and create sites for secondary invasion of disease organisms. In general, infected livestock cannot be healthy or efficiently managed to realize optimum production levels.”

“Several species of mosquitoes attack livestock causing painful bites, unthriftiness, and occasionally death by suffocation or heavy blood loss. In addition, their attacks can cause loss of weight and decreased milk production.”

P. E. Kaufman, P. G. Koehler and J. F. Butler. External Parasites on Beef Cattle. University of Florida, IFAS Extension; ENY-274. Pg 1 & 7.

Kevin Shoemaker
GIS/Information Officer
Benton County Mosquito Control
4951 West Van Geisen
West Richland, WA 99353

Mosquito Control District of Cowlitz County

PO Box 1261
Longview, WA 98632

March 8, 2010

Mr. Jon Jennings
Aquatic Pesticides and CAFOs
Water Quality program
Washington State Department of Ecology P.O. Box 47600
Olympia, WA 98504

Dear Mr. Jennings:

I have served as the Cowlitz County Mosquito Control District's attorney since its inception in 1990 and have been retained by the Benton, Franklin, Skamania and Grant Counties' Mosquito Control Districts for the purposes of providing legal advice and comments with respect to this permit. It is my opinion that if the draft permit language becomes final, it will be necessary that the Districts cease all applications targeting adult nuisance mosquitoes.

The definition of Waters of the State is too vague:

Waters of the State: All surface and ground waters in Washington State as defined by chapter 90.48.020 RCW and all future amendments of state statute. **90.48.020** reads that "waters of the state" shall be construed to include lakes, rivers, ponds, streams, inland waters, underground waters, salt waters and all other surface waters and watercourses within the jurisdiction of the state of Washington.

In order to target adult mosquitoes the equipment used by the Districts is designed to generate an aerosol cloud. The droplets produced by specialized mosquito control equipment have a 300ft spray swath. Aerial applications can produce a spray swath of 300- 1000 feet. In order to prevent any residue from depositing on the water during these applications, Mosquito Control professionals would be forced to place a large buffer around all waters of the state as defined above. The buffers would be so

numerous and difficult to navigate that the operator would unavoidably expose surface waters to residue. It is my opinion that both the operator and his or her employer, the District, would be in violation of the permit guidelines, thus exposing the district to potential fines and penalties.

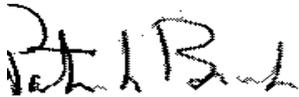
In our view, there are arguably two solutions to this conflict. First, clarify the definition of "waters of the state." If the definition were altered to reflect only navigable waters such as rivers and streams this would be amenable to my clients. Second, modify the permit language to allow incidental amounts of adulticides and their residues into waters of the state for nuisance mosquito control.

Frankly, we are unclear as to whether it is Department of Ecology's position that it lacks the legal authority to make these modifications, or is it simply believed that such accommodation is inappropriate. If it is the former, we would request that the Department of Ecology state in clear terms why this is believed to be the case. If it is the latter, we would ask that the Department of Ecology reconsider and make the changes requested.

I ask that these comments be given full consideration prior to issuance of a final permit.

Thank you for the opportunity to provide comment on the Preliminary Draft Aquatic Mosquito Control National Pollutant Discharge Elimination System State Waste Discharge General Permit.

Sincerely,



Patrick Brock Attorney at Law Bar No.
1642

Cowlitz Co. Mosquito Control District Benton Co. Mosquito
Control District Franklin Co. Mosquito Control District
Skamania Co. Mosquito Control District Grant Co. Mosquito
Control District

March 16, 2010

SUBJECT: Legal Ramifications of the Draft Aquatic Use Permit

Dear Mr. Jennings,

Throughout this last year I have had several conversations with attorneys, Federal, State and Local Representatives, and individuals that work with regulatory agencies on a daily basis. I now have a better understanding of the challenges in preparing a general permit for pesticide applications. I appreciate the steps that you have taken to reduce the costly burden of water monitoring, and also the political restraints involved in declaring a Public Health Emergency. These were good steps, but our organizations must continue to work together and modify the permit so that it addresses the concerns of the operators, public health, and water quality.

It is clear that a permit is required for our district to discharge pesticides into certain waters. As qualified and conscientious pesticide applicators we take full responsibility for our control actions, and will abide by the finalized general permit. As a District Manager it is my responsibility to take into account the well-being of the public and examine the risks of pesticides during daily operations. I would not approve an application that caused harm to the environment, the applicator or the residents. I realize that there are residents opposed to pesticide use, but I also know the vast majority of the citizens rely on our District to protect them against mosquitoes; all mosquitoes. This document covers public health pesticides, and I am outraged that a state department would place such harsh restrictions on products that are so clearly beneficial.

I believe that Ecology could have postponed adding adult control products to the general permit without repercussions until the EPA made their recommendations in 2011. I also believe that pushing this permit through quickly rather than creating a good working permit will result in lengthy permit challenges. Benton County MCD faces possible lawsuits by spraying without the permit, but if the permit is approved as written we will face lawsuits from the residents for neglecting our duties. The Department of Ecology has the ultimate authority on which pesticide applications are allowed and which are not. You do not have an obligation to the residents of Benton County to keep them safe from mosquito attacks; I do. I strongly urge Ecology to alter the permit to honor the requests of Mosquito Control Districts. You will remain in compliance with the Clean Water Act and you will be doing a great service to the people of Washington.

Sincerely,

Angela Balint
District Manager
Benton County Mosquito Control District #1
(509) 967-2414