**Edwards MAD NPDES Pesticide General Permit Pesticide Discharge Management Plan (PDMP)**

1. Pesticide Discharge Management Team:
    a. Person(s) responsible for managing pests in relation to the pest management area:
        i. Edwards Mosquito Abatement District Staff
        PO Box 561
        13099 S Norwood Rd
        Donnelly, ID 83615
        telephone: 208-325-4096
        email: edwardsmosquitoabatement@gmail.com

    b. Person(s) responsible for developing and revising the PDMP:
        i. Nathan Mitchell, District Manager, Edwards Mosquito Abatement District
        PO Box 561
        13099 S Norwood Rd
        Donnelly, ID 83615
        telephone: 208-325-4096
        email: edwardsmosquitoabatement@gmail.com

    c. Person(s) responsible for developing, revising, and implementing corrective actions and other effluent limitation requirements:
        i. Nathan Mitchell, District Manager, Edwards Mosquito Abatement District
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    d. Person(s) responsible for pesticide applications:
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        ii. Dave Brauneisen, Control Tech, Edwards Mosquito Abatement District
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        iii. Hank Tamcke, Control Tech, Edwards Mosquito Abatement District
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2. Problem Identification:
    a. Pest problem description: The Edwards Mosquito Abatement District (EMAD) was established in 1988 by a group of ranchers to combat the local nuisance mosquito population, since then

it has grown to include the north end of Lake Cascade. EMAD personal have been conducting mosquito surveillance for serval years along with historic seasonal control operations that were used as a basis to identify the pest problems. Figure 1 (page 5) depicts the portion of Valley County, where EMAD operations are conducted. The pink highlighted area represents the current boundaries and jurisdiction of the EMAD.

i. Pest Identification: the Edwards MAD is known to contain 23 species of mosquitoes, although the district actively surveys and conducts control efforts primarily for 6 species listed below:

1. *Anopheles freeborni*, the Western Malaria Mosquito, overwinters as an adult in sheltered locations and emerges in early spring. The species is one of the first biters of the season when the air is still cold. They are more active at dusk and during the night but occasionally do attack man during the daylight hours in dense shade or on cloudy days. Females lay eggs in permanent water sources, riparian and mixed habitats, anywhere water is pooled for week or longer.

2. *Aedes vexans,* the Inland Floodwater Mosquito, overwinters in the egg or larval stage and there are generally one or more broods per season. They are a major nuisance, the females will bite in the evening, peaking in activity an hour or so after sunset, feed in shady places during the day. Females lay eggs in temporary pools or irrigated fields, but also permanent water bodies where the water level fluctuates.

3. *Culiseta inornata*, the Winter Marsh Mosquito, prefers to feed livestock or other large mammals, rarely humans. At dusk during the fall is the most common time for biting activity by this species. They are active flyers and can disperse 5 to 10 miles from their emergence sites. Larvae live in temporary and semi-permanent woodland pools, marshes and edges of ponds.

4. *Culex pipiens*, the Northern House Mosquito is a multi-brood species, overwinters as an adult that lays its eggs in rafts in both temporary and permanent water sites, such as catch basins, retention ponds or road side ditches, pretty much anything that will hold water for more than a week during summer. Birds are the preferred hosts for this mosquito. *Culex pipiens* is a vector of Western Equine Encephalitis (WEE), St. Louis Encephalitis (SLE), and WNv.

5. *Culex tarsalis*, the Western Encephalitis Mosquito, overwinters as an adult in protected places like, outbuildings, abandon mines, culverts, animal burrows and any other sheltered locations. Upon emerging, the female seeks a blood meal to mature her eggs that will be laid on rafts. Preferred breeding sites are mostly permanent water sites such as marshes, waste irrigation water, ditches with poor drainage, retention ponds, and catch basins. Females are persistent biters and prefer birds in the spring, then later turn to mammals and humans as a source for a blood meal. *Culex tarsalis* is a vector of WEE, SLE, and WNv.

6. *Ochlerotatus nigromaculis*, commonly known as the “pasture mosquito” is a common pest throughout the west and Idaho, closely associated with

agricultural and surrounding areas. Poor irrigation practices on pasture land and drainage ditches with fluctuating water levels are the most common development sites. It bite is painful and continuously attack its host. It is a strong flyer and may migrate several miles from its development site. This mosquito species can transmit WEE, SLE, and California encephalitis virus.

ii. Pest sources: pest problems can best be separated into 2 broad types within our service area that can be further divided into more specific groups based on habitat type.

1. Natural Environments:

a. Lake Cascade is a reservoir with several low grassy areas along the northern shorelines, along with several irrigation ditches, floodplains with small tributaries that feed abundant potential habitat. In addition, there are numerous marshlands, swampy areas, bird refuges, and wildlife management areas located all around Lake Cascade. The mosquito species commonly found in these environments include *Culex tarsalis*, *Culiseta inornata*, *Anopheles freeborni*, and *Aedes vexans*.

b. Ponds, tree wells, natural springs, isolated wetlands, low areas within pastures where spring snow melt will allow water to collect. Areas like these occur throughout the district and the county. Sloughs especially in the northern part of the district they produce large numbers of mosquitos, as the lake fills up from the summer melt off the low grassy areas along the shoreline provide perfect habitat for flood water *Aedes* species. These areas often have residential areas nearby. Many of these sites only contain water during the spring and early summer, but serve as excellent host environment for most species of mosquitoes found in our district.

c. Other natural environments include seeps, and small snow melt pools in the spring, but they usually don't pose any significant problems.

2. Man-made Environments:

a. Ditches and canals are frequently suggested as sources of mosquito problems by the general public. However, these features are rarely a primary source of a mosquito infestation, especially if these systems tend to hold water on a permanent basis or if the water is moving. On the other hand, shallow, roadside ditches do contribute to mosquito populations at times. Mosquito species at sites like these include *Culex tarsalis*, and *Culiseta inornata*.

b. Livestock pastures with heavy irrigation can pose a problem for residents that live nearby. People and livestock provide a blood meal and water troughs provide a breeding site. Mosquito species associated with irrigated pastures include *Ochlerotatus nigromaculis*, and *Aedes vexans*.

c. Storm drains and catch basins are minimal in the district, only found downtown Donnelly. The more the region faces development, storm drain and catch basins will become a higher priority for the district.

b. Action Thresholds:

i. Larval Mosquito Control Thresholds:

1. Average of 1 or more larvae in five dip cup samples per treatment site. Actual treatments will be based on local demographics, mosquito species presents, and other historic and current conditions.

2. The storm water system may be treated in selected areas of the district where vector species have been found or there is a history of arbovirus activity.

3. A limited number of known, historic development sites may be treated prior to larval presence because of limitations in time to inspect and treat all larval sites within the district.

ii. Adult Mosquito Control Thresholds:

1. *Culex* spp.:
   a. 5 or more mosquitoes per New Jersey light trap per two consecutive nights
   b. 5 or more mosquitoes per CDC trap per trapping event, prior to detection of WNv
   c. 1 or more mosquitoes per CDC trap per trapping event, after detection of WNv.

2. *Anopheles* spp.:
   a. 5 or more mosquitoes per New Jersey light trap per two consecutive nights. 100 or more mosquitos per CDC trapping session.

3. *Aedes* and *Ochlerotatus* spp.:
   a. 50 or more mosquitoes per New Jersey light trap per two consecutive nights. 100 or more mosquitos per CDC trapping session

4. Citizen complaints:
   a. 5 or more complaint calls from an ultra-low volume (ULV) spray zone during a 5 day period.
   b. 25 or more complaint calls across the entire district during a 5 day period.

5. Landing Counts:
   a. Reports from staff of landing rates greater than 5 mosquitoes in a 1 minute period at any inspection site.

6. Larval Control Failure:

a. Any reports from technicians of a larval control failure at any development site within district jurisdiction.

7. Service Requests:
   a. Limited area treatments may be conducted prior to special events or community functions, based on requests for service.

c. General Location: Please refer to Figure 1 below as a reference to where all applications for mosquitoes control will take place. All sites within the magenta highlighted area are subject to larval mosquito control and adult mosquito control applications.

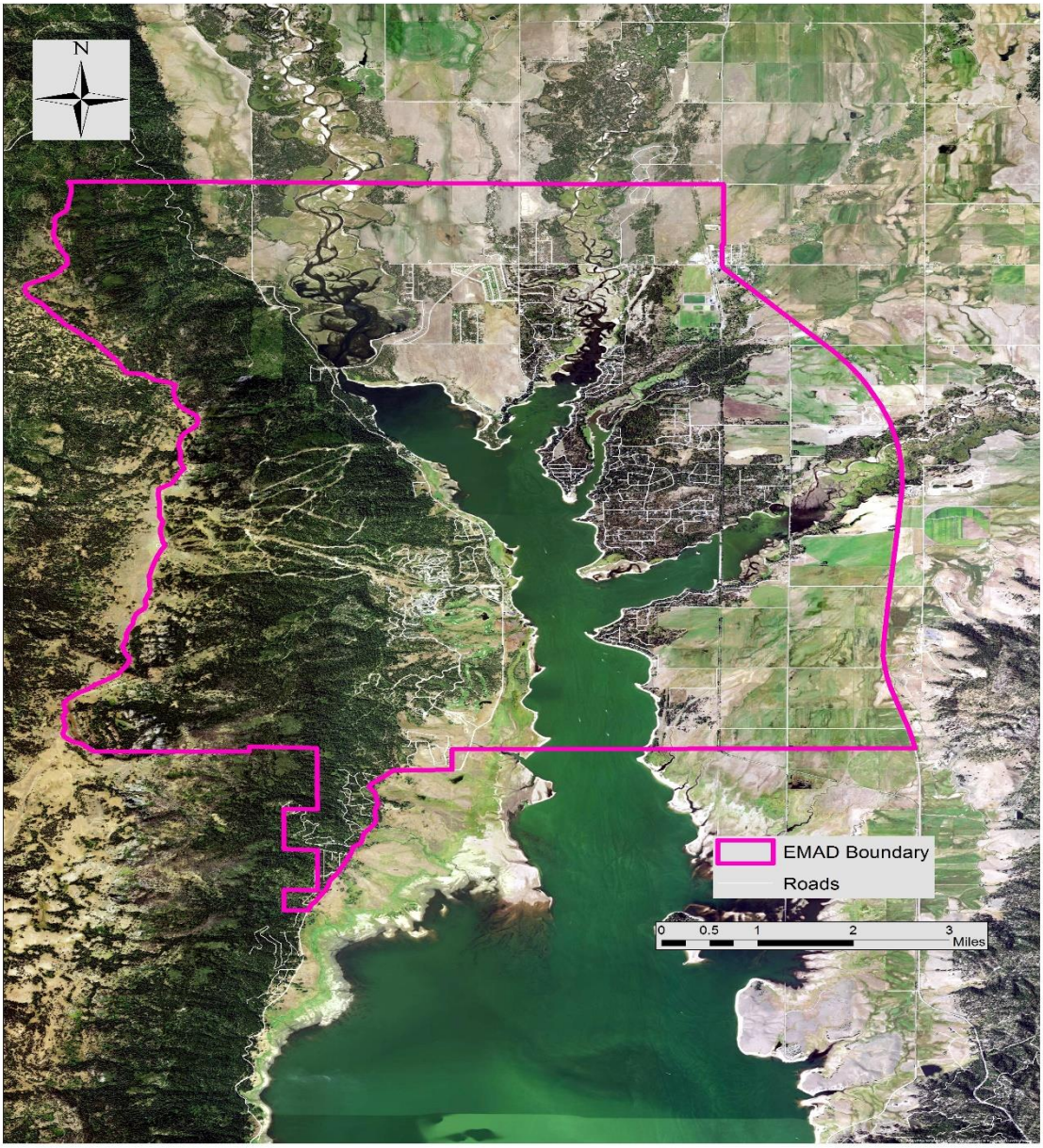


Figure 1. Northern portion of Cascade Lake within Valley County. City of Donnelly is in the northeast corner of the district

d. Water Quality Standards – Waterways in the Edwards MAD are not impaired with any pesticides or pesticide degradants used by the Edwards MAD.

3. Pest Management Options Evaluation: A description of the control measures to demonstrate how the operators specifically plan to meet the applicable technology-based or water quality-based effluent limitations.

a. No action or at least delayed action may be taken by the Edwards MAD at times when a major portion of the district has been inundated with water. When a regional wide flooding event takes place it is generally more economical and environmental friendly to allow mosquito larvae to emerge and treat for adults at a later time. This is because not all larval habitats can be treated in a timely manner to prevent adult emergence, and adult mosquitoes will migrate into our service area from the surrounding regions that have no or reduced mosquito control resources. Conversely, no action may also be taken when sites containing larvae are shallow, and extended weather forecasts indicate dry conditions. Such situations allow larval habitat to dry before mosquitoes can complete their aquatic life stages, and no adults result.

b. Prevention; mechanical/physical methods; and cultural methods are by definition very similar in nature and share many characteristics. These methods can be as basic as simply emptying water from containers or as complex as repairing broken water lines which often requiring the involvement of other county departments. A mosquito awareness program conducted at Donnelly Elementary allows Edwards MAD the opportunity to suggest ways that residents can assist in the prevention of mosquito problems by removing containers and articles from their yards that provide larval habitat, and to be mindful that birdbaths and pet water bowls could serve as mosquito development sources when not properly maintained.

c. Mechanical/physical methods are methods in which mosquito habitat is physically altered to remove or reduce the amount of available larval habitat and is difficult to incorporate for many reasons. Primarily, mosquito habitat on private property requires substantial input from the property owner and if the property owner does not want alterations to the property, the district does not have jurisdiction to do so without permission, we do suggest that property owners clean and maintain ditches and culverts on and around their property. Better drainage will reduce available breeding sources and can often have lasting results.

d. Biological control agents:

i. Biological control agents used by Edwards MAD includes formulations containing *Bacillus sphaericus* and/or *Bacillus thuringiensis israelensis*. Biological control agents are used to control mosquito larval sites within our jurisdiction. Application of biological larval control agents (larvicides) requires considerable personnel, equipment, materials, surveillance, and expense. However, this type of control application offers good long-term control of mosquitoes. Biological larvicides are applied on foot with a backpack spreader, with ATVs if accessible or by hand

ii. Natural predators could be viewed as biological control agents. The Edwards MAD has researched the efficacy of mosquito control by several natural predators including bats, swallows, and dragonflies,

1. Bats: insectivorous bat diets consist mainly of beetles, wasps, ants, flies,

stoneflies, mayflies, moths, and grasshoppers. Mosquitoes make up less than 1% of their diet. Also location of bat houses should also be taken into consideration, emphasizing that bats carry rabies. Separation of bat houses from the human population is a good practice.

2. Swallows and martins prefer larger terrestrial insects over mosquitoes. Mosquitos make up less than 3% of their diets.

3. Dragonflies: dragonflies are already established in the valley The Edwards MAD will do everything feasible to ensure that they are protected from district insecticide applications in the valley.

Note: to date, these methods have not been cost effective with increased manpower to facilitate and monitor, and the ongoing use of pesticides by the agricultural community makes this type of control prohibitive at this time.

e. Chemical control methods: a timely and appropriate response to mosquito and human surveillance findings is the key for preventing an outbreak or further spread of human disease. The Edwards MAD will implement a phased response to surveillance findings that will expand education, prevention, and control activities in relation to the threat of an outbreak of mosquito-borne disease. If mosquito surveillance indicators such as trapping results, landing rates, biting rate counts, and verifiable complaints from district constituents suggest that the level of mosquitoes pose a significant human discomfort or threat to health, mosquitoes will be controlled through the use of chemical mosquito control agents. Habitat, weather, time of year and proximity to human populations will be considered in determining the necessity of chemical mosquito control. The accuracy, quality, and efficacy of insecticide applications will be closely monitored to ensure compliance with federal and state regulations. When the application of insecticides becomes necessary, it is often as the district's last choice of control measures. Products are applied according to the label using equipment that is closely monitored and calibrated and by Edwards MAD staff who are licensed and trained.

    i. Chemical control of larval mosquitoes:

        1. The chemical control of larval mosquitoes includes the application of insecticides with several modes of action. Insect growth regulators, such as methoprene based products, interrupt the development cycle of mosquitoes. Larviciding oils can be applied to standing water, making it impossible for larvae to penetrate the surface film, therefore causing suffocation. Mononmolecular films or MMFs lower the tension of the water's surface, therefore making it impossible for larvae to "attach" to the surface for breathing purposes, and ultimately causes suffocation. Pyrethrin can be applied to standing water and ultimately kill mosquito larvae through a toxic interaction.

    ii. Chemical control of adult mosquitoes:

        1. The objective of chemically controlling adult mosquitoes is to reduce the abundance of adult mosquitoes in targeted areas through the use of ultra-low volume (ULV) insecticide applications. All ULV treatments are restricted to property within the district's jurisdiction or within mosquito migrating

distance to the district and all treatments are applied according to the insecticide's label directions. All treatment equipment is calibrated as recommended by the insecticide label directions and is certified annually. The district uses a synthetic pyrethroid- based product occasionally alternating classes as a precaution against insecticide resistance.

iii. Operators must consider impact to non-target organisms, impact to water quality, pest resistance, feasibility, and cost effectiveness when evaluating and selecting the most efficient and effective means of pest management to minimize pesticide discharge to waters of the United States.

4. Response procedures: Spill response and adverse incident procedures are documented in following section as required.

a. Spill response procedures: every pesticide applicator needs a plan for dealing with pesticide spills. Only by planning ahead can applicators be ready to react quickly to handle a spill properly. The time spent on preparing a plan will be extremely valuable in an emergency when seconds count. The first step in the plan is to identify the practices that increase the risk or danger of pesticide spills. These practices can be divided into three activities: storage, mixing/handling, and transportation.

Storage: no job is really finished until the pesticides, containers, and equipment have been put away properly. Creating the habit of storing all materials safely before cleaning up, or moving on to the next job will ensure spill prevention. While cleaning up and putting away pesticides, containers, and equipment, wearing all the personal protective equipment (PPE) used on the job is necessary. Consider wearing gloves and other protective equipment, even if they weren't required on the label.

Mixing/handling: mix pesticides in a safe place. Mixing in the field eliminates the transportation of large quantities of mixed pesticide along city and county roads. Never mix pesticides near a wellhead, stream, or other potential water contamination source.

Transportation: when transporting pesticide containers, tie them down securely, carry clean-up equipment, take the best roads, and avoid streams or rivers. When going out to apply pesticides, check equipment thoroughly, avoid steep places, and drive with extreme caution.

i. Spill Management - if a spill occurs, adhere to the following procedures:

1. Control: Identify the source of the spill and try to stop it, preventing further spillage. For example, if a small container is leaking, place it in a larger waterproof container, if a hose has broken, turn off the pump. Isolate the area. Rope it off or place barriers around it. Keep people and animals at least 30 feet away from the spill. Avoid coming into contact with any pesticide or fumes.

2. Containment: don appropriate safety gear. At a minimum, a long-sleeved shirt, long pants, rubber or neoprene boots and gloves should be worn while cleaning up a spill. Depending on the product, the amount spilled, and whether the spill is within an enclosed area or outdoors, a respirator and goggles may be needed. Wear the level of protective gear required on the pesticide label for use during handling the pesticide. Stop the spread of the

pesticide spill. Place containment material around the spill or build a dam of soil. It is important to prevent the pesticide from entering any body of water, including storm drains or sewers. Spread absorbent material such as kitty litter, vermiculite, or a commercial spill containment product over the remainder of the spill. Dry pesticides will not spread very far except during windy and/or rainy weather. Never hose down a spill, this only spreads the pesticide.

3. Clean up: continue to add absorbent material until all the liquid is soaked up. Shovel the contaminated material into a leak-proof container. Decontaminate the area. Common household bleach is usually an effective chemical on concrete or wood surfaces. Read the pesticide label for specific decontamination directions. For minor spills, apply activated charcoal to contaminated soil. For large spills, the only effective way to decontaminate soil saturated with pesticide is to remove the soil until no visible stain or odor is observed. Whether these soil clean-up methods are justified depends on which pesticide was spilled and how much was spilled.

4. Disposal: if possible, the spilled pesticide should be applied to a labeled site at or below the labeled rate. Contaminated soil and absorbent materials must be disposed of properly. Check pesticide label for proper disposal.

ii. Notification procedures:

1. Minor spills: minor spills are spills that do not involve injury to citizens or personnel, result in damage to vehicles and equipment, and do not result in contamination of Waters of the U.S.
    a. Notify immediate supervisor or district office.
    b. Refer to spill response protocol.

2. Major spills: major spills could involve injury to citizens or personnel, could result in damage to vehicles and equipment, or could result in contamination of Waters of the U.S.
    a. If spill results in injury to citizens or personnel, call 911.
    b. If spill results in damage to a vehicle, call 911 if needed and then contact district manager.
    c. If spill results in damage to equipment, determine severity and scope of spill, and assess whether or not emergency services are needed to protect people and Waters of the U.S. Contact emergency services if needed and then contact district manager and immediate supervisor.
    d. If spill results in potential contamination of Waters of the U.S., contact district manager or district field supervisor. District manager will contact local HAZMAT team, Idaho Department of Environmental Quality (DEQ) and regional EPA office.

b. Adverse Incident Response Procedures:

i. Procedures for responding to any Adverse Incident resulting from pesticide applications:

1. Once an Adverse Incident is observed, the operator shall notify the district manager immediately.

2. The district manager shall determine whether or not the Adverse Incident is a result of applications or discharges made to Waters of the U.S.

3. If it is determined that the Adverse Incident is a result of applications or discharges made to Waters of the U.S., the district shall cease all applications made to the area affected, and will report as required by the permit.

4. The operator will then take appropriate steps to correct, repair, remedy, clean up, or otherwise address any adverse effects.

ii. Procedures for notification of the Adverse Incident, both internal to the district, and external:

1. If an operator observes or is otherwise made aware of an adverse incident, which may have resulted from a discharge from a pesticide application, the operator must immediately notify the district manager and the appropriate EPA Incident Reporting Contact, as identified at www.epa.gov/npdes/pesticides. This notification must be made by telephone within 24 hours of the operator becoming aware of the adverse incident and must include at least the following information:
    a. The caller's name and telephone number;
    b. Operator name and mailing address;
    c. If covered under an NOI, the NOI NPDES permit tracking number assigned by EPA;
    d. The name and telephone number of a contact person, if different than the person providing the 24-hour notice;
    e. How and when the operator became aware of the adverse incident;
    f. Description of the location of the adverse incident;
    g. Description of the adverse incident identified and the pesticide product, including EPA pesticide registration number, for each product applied in the area of the adverse incident;
    h. Description of any steps the operator has taken or will take to correct, repair, remedy, clean up, or otherwise address any adverse effects; and
    i. If known, the identity of any other operators authorized for coverage under this permit for discharges from the pesticide application activities that resulted in the adverse incident.
    j. If an operator is unable to notify EPA within 24 hours, the operator must do so as soon as possible and also provide an appropriate rationale for why the operator was unable to provide such notification within 24 hours.

5. The adverse incident notification and reporting requirements are in addition to what the district is required to submit under FIFRA section 6(a)(2) and its implementing regulations at 40 CFR Part 159.Documentation to support eligibility considerations under other federal laws:

    a. Documentation will be kept with the Pesticide Discharge Management Plan that supports the determination that the Edwards MAD meets Criterion A of Section 1.1.2.4 (Endangered and Threatened Species and Critical Habitat Protection).

6. Signature and Declaration:

I, Nathan Mitchell, certify the Edwards Mosquito Abatement District's Pesticide Discharge Management Plan as in accordance with Appendix B, Subsection B.11 of the NPDES Pesticide General Permit (http://cfpub.epa.gov/npdes/home.cfm?program_id=410).

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Nathan Mitchell, District Manager Date