

**FAQ on Proposed Pesticide General Permits  
To Control Invasive Elodea and Invasive Fish  
July 19, 2019**

**1. Why are general permits proposed for authorization of projects for control of invasive elodea and for control of invasive fish?**

Invasive species present a significant risk to the environment. Rapid response before populations of can spread to new areas is an essential component of invasive species control. DEC has previously authorized multiple invasive elodea or invasive fish projects under individual permits. Individual permits have inherent delays which ultimately delay timely response to invasive pests.

For many projects, the time spent evaluating a proposal to use pesticides under conditions that require a DEC permit is important to ensure that there will not be any unreasonable adverse effects. DEC's review of such projects takes into account location-specific issues, and in some cases, a product may not have been used under these circumstances.

DEC has had the opportunity to observe multiple similar projects for invasive elodea control using diquat dibromide and/or fluridone; as well as multiple projects for invasive fish control using rotenone. In either case, there have been no observed or reported adverse effects under the conditions that the projects were performed. As such, DEC believes that such projects are most appropriately managed under a general permit.

Elodea is an invasive aquatic plant that has the potential to grow abundantly and compromise water quality, hinder boat and float plane traffic, reduce dissolved oxygen, and impact fisheries. Physical or mechanical controls are inappropriate, as these methods break the plant into fragments which can then reproduce.

Invasive fish present a significant risk to native fish. Some invasive species prey on native trout and salmon species, and have the ability to destroy native fish populations. Other invasive fish have been found to harbor parasites or diseases which could impact native fish. Other control methods such as water draw down and physical removal have been found to be impractical or ineffective.

**2. How will DEC know when pesticides are being applied under the General Permits?**

Prior to pesticide application under a general permit, applicants who wish to be covered under either general permit must:

- meet all permit conditions
- obtain a confirmation letter

- be issued a project tracking number from DEC.

**3. Will an elodea control project authorized under a general permit be as safe as one authorized under an individual permit?**

The proposed general permit for invasive elodea control is limited to specific conditions and circumstances that are well understood and are the same as previous projects authorized under individual permits.

Only elodea control projects overseen or managed by the Alaska Department of Natural Resources Invasive Plant Program would be eligible for coverage under the proposed general permit for invasive elodea control. Only water bodies with minimal or no outflow would be treated under the proposed general permit. This general permit will allow only the use of specific pesticide formulations with the active ingredients fluridone or diquat dibromide, which have a significant history of use.

In recent years, DEC has issued a number of individual aquatic permits for control of invasive elodea. For each of these permits, DEC conducted a full evaluation to determine if unreasonable adverse effects to public health, safety, or welfare, animals, or the environment would be expected. There were no reports of problems as a result of these uses, and control of target species has been effective.

There is no evidence to indicate that conditions in Alaska would significantly affect the persistence, fate, mobility, or action of these products that would result in unreasonable adverse effects.

Under the conditions and sites allowed by the proposed General Permit, use of these pesticides in accordance with label instructions is unlikely to result in any unreasonable adverse effects, and use of these pesticides under a General Permit provides comparable protection as an individual permit.

**4. Will an invasive fish project authorized under a general permit be as safe as one authorized under an individual permit?**

The proposed general permit for control of invasive fish is limited to specific conditions and circumstances that are well understood and are the same as previous projects authorized under individual permits.

Only invasive fish control projects overseen or managed by the Alaska Department of Fish & Game would be eligible for coverage under the proposed general permit for invasive fish control. This general permit will allow only the use of specific pesticide formulations with the active ingredient rotenone.

In treatments areas with outflow, the permittee will be required to ensure treatment levels of rotenone do not leave the targeted treatment area. This will include a requirement to install and monitor sentinel fish stationed downstream of the treatment area to detect presence of rotenone. The permittee will also be required to apply potassium permanganate, which deactivates rotenone, if sentinel fish exhibit any signs of rotenone impacts.

In recent years, DEC has issued a number of individual aquatic permits for control of invasive fish. For each of these permits, DEC conducted a full evaluation to determine if unreasonable adverse effects to public health, safety, or welfare, animals, or the environment would be expected. There were no reports of problems as a result of these uses, and control of target species has been effective.

There is no evidence to indicate that conditions in Alaska would significantly affect the persistence, fate, mobility, or action of these products that would result in unreasonable adverse effects.

Under the conditions and sites allowed by the proposed General Permit, use of these pesticides in accordance with label instructions is unlikely to result in any unreasonable adverse effects, and use of these pesticides under a General Permit provides comparable protection as an individual permit.

## **5. What are fluridone and diquat dibromide?**

These pesticides have a significant history of use both in Alaska and across the country, and effects are well known and well understood.

Diquat dibromide is a contact herbicide labeled for use in controlling aquatic vegetation in a variety of aquatic sites. Diquat dibromide kills target plants by disrupting cell membranes and interfering with photosynthesis.

Fluridone is a selective systemic herbicide labeled for use in controlling aquatic vegetation in a variety of aquatic sites. Fluridone kills target plants by inhibiting the formation of carotene. In the absence of carotene, chlorophyll is degraded by sunlight, preventing the plant from photosynthesizing.

Diquat dibromide binds quickly to suspended sediment in the water column and to soils. Fluridone binds to clay and soils with high organic matter, especially in pellet form. Once bound to sediments, the products become biologically unavailable and are no longer active. Between partitioning to soils/sediments, and dilution as the product disperses, there is a very low likelihood that these products could have any impacts outside of the treatment area.

Within treatment areas, impacts to non-target organisms or the environment are not expected to be significant. Both fluridone and diquat dibromide have been used a number of times in recent years in Alaskan lakes with no unreasonable adverse effects identified. These products have also been extensively used in similar applications in other states, with no significant impacts to non-target organisms or the environment.

Diquat dibromide is non-toxic to fish and does not bioaccumulate. Fluridone does not appear to have any apparent short-term or long-term effects on fish at normal application rates. When used at label rates, there are no anticipated impacts to birds or mammals from either diquat dibromide or fluridone. Fluridone and diquat dibromide show moderate toxicity to aquatic invertebrates. Invertebrates that are affected would be expected to repopulate treated areas once treatment was completed.

The quantity of decomposing vegetation is generally not sufficient to cause significant damage to water quality. Effects on water quality parameters such as clarity, dissolved oxygen, and nutrient levels, which may be impacted by decaying plant matter, would be expected to return to normal over a short period of time. In addition, treatments occur during summer months when there is high lake turnover. This mixing results in a rapid return to normal oxygen levels.

Colder temperatures in Alaska can affect breakdown of some pesticides and may result in longer persistence. However, as explained above, both pesticides bind to suspended sediment in the water column and to soils. Therefore, any increase in persistence would be irrelevant because the product becomes biologically unavailable when bound to sediments.

When used at label rates, there are no anticipated health effects to humans. Because the pesticides bind to sediments, they will not migrate through groundwater into any nearby drinking water wells. The proposed General Permit does not allow application of these products near potable water intakes, in accordance with label instructions.

## **6. What is rotenone?**

This pesticide has a significant history of use both in Alaska and across the country, and effects are well known and well understood.

Rotenone is a naturally occurring substance derived from the roots of certain plants in the bean family. Rotenone is toxic to fish, and is used to eradicate entire populations of fish within a water body. It has been widely used to remove invasive fish species and allow for re-stocking of native or game fish.

Fish absorb rotenone through the gills. Once in the bloodstream, it inhibits a biochemical process, making it impossible for fish to use the oxygen absorbed in the blood. At normal treatment levels, rotenone is selective to fish and other gill-breathing organisms

Although rotenone can be toxic to non-gill-breathing organisms at very high concentrations, these concentrations greatly exceed normal use levels. When used according to label, it has little or no impact to non-target species, and poses little, if any, hazard to public health. When used at appropriate application rates indicated by pesticide product labels, there is no anticipated health effect to birds, mammals, or plants. Amphibians and aquatic invertebrates are impacted by rotenone, but have been found to repopulate water bodies readily after rotenone dissipates.

Colder temperatures in Alaska can affect breakdown of some pesticides and may result in longer persistence. However, this increase in persistence is often a benefit as it allows for longer treatment times and more complete eradication of target fish.

When used at label rates, there are no anticipated health effects to humans. Because rotenone binds to sediments, it will not migrate through groundwater into any nearby drinking water wells. The proposed General Permit does not allow application of these products in water bodies with potable water intakes.