Agency of Natural Resources
Department of Environmental Conservation

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MEMORANDUM

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Date: March 16, 2022

Subject: Aquatic Nuisance Control Permit, ProcellaCOR EC Aquatic Toxicity Review

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Aquatic Nuisance Control Permit (ANCP) applications propose use of the aquatic herbicide product ProcellaCOR EC with the active ingredient florpyrauxifen-benzyl, to help control the growth and spread of the aquatic nuisance plant Eurasian watermilfoil. ProcellaCOR EC received its full aquatic registration from EPA in February 2018 (EPA Registration #67690-80) and is registered for use in Vermont.

ProcellaCOR EC was granted Reduced Risk status by EPA under the Pesticide Registration Improvement Act (PRIA) because of its promising environmental and toxicological profiles in comparison to currently registered herbicides utilized for treatment of invasive watermilfoils, and other noxious plant species.

This memorandum provides a review of the proposed use of ProcellaCOR EC and the potential impact on non-target aquatic animals. The 2017 EPA Environmental Fate and Ecological Risk Assessment for florpyrauxifen-benzyl was the primary source of data reviewed. Florpyrauxifen-benzyl is practically non-toxic on an acute basis to bees, reptiles, fish, birds and mammals. Toxicity to fish and aquatic organisms was not observed, in most cases, at the highest levels tested.

Application rates of 3 - 5 Prescription Dose Units (PDUs) / per acre-foot will result in a maximum florpyrauxifen-benzyl concentration of 9.65 ppb /acre foot (range 5.79 – 9.65 ppb/acre foot). These application rates are less than 20 percent of the maximum allowable application rate, which allows use of up to 25 PDUs per acre-foot, which corresponds to approximately 50 ppb.

ProcellaCOR EC exhibits low water solubility (~15 ppb), and in laboratory aquatic ecotoxicity studies, the highest concentration that could be dissolved in the test water was approximately 40-60 ppb. When applied directly to aquatic sites, ProcellaCOR EC is expected to dissipate quickly, with rapid photolysis (<1day) and aerobic aquatic metabolism (4-6 days) as the major routes of degradation. ProcellaCOR EC is also degraded by sunlight.

Review of ecotoxicity studies based on maximum label rate of 50 ppb, indicates parent compound and degradates show toxicity levels are well above the application rates used in aquatic environments. Therefore, the potential for acute risk to fish, invertebrates, amphibians, birds and mammals is expected to be low. Chronic toxicity of concern would be short lived due to rapid degradation in the environment, and rapid dilution from spot application use pattern.

For aquatic animals, only the parent compound was considered the stressor of concern. Available toxicity data shows that the degradates of ProcellaCOR EC are less toxic to aquatic animals than the parent compound. Acute ecotoxicity testing using various ProcellaCOR EC metabolites indicated lethal concentration (LC50) values uniformly greater than 1,000 ppb, indicating a minimal potential for acute toxicity from metabolites.

ProcellaCOR EC was not acutely toxic up to its functional limit of solubility (40 ppb) in tests on freshwater invertebrates and freshwater fish, including rainbow trout, fathead minnow and common carp. It was not chronically toxic to freshwater fish up to limit of functional solubility. The freshwater fish studies served as surrogate for aquatic-phase amphibians. Chronic toxicity to freshwater invertebrates was accomplished with 21-day chronic test performed on *Daphnia magna*, the most sensitive endpoint from testing was a No Observable Adverse Effect Concentration (NOAEC) of 38.5 ppb.

Toxicity testing with juvenile rainbow trout indicated no toxicity at limit of solubility application rate (40 ppb). If fish were to occupy a plant-infested littoral zone that was treated by ProcellaCOR EC, no toxic exposure would be expected to occur, as toxicity thresholds would not be exceeded.

Bioaccumulation data in fish showed low bioconcentration factors and rapid depuration, suggesting extensive metabolism, and limited risk to predatory birds and mammals that may consume fish. Metabolism data for mammals also demonstrates extensive metabolism, indicating bioaccumulation is unlikely. ProcellaCOR EC is also short lived in aquatic metabolism systems (2-6 days), which further limits its potential for bioaccumulation in the environment. Acute and chronic effects on birds were studied in bobwhite quail and mallard duck, results indicated ProcellaCOR EC is practically non-toxic, with effect concentrations magnitudes of order greater than application rates.

No data gaps have been identified for the basic environmental profile of ProcellaCOR EC, including environmental fate, product chemistry, toxicology and ecotoxicology, and field studies required by EPA for pesticide registration.

Based on this review, the potential for acute and chronic risks to fish, aquatic invertebrates, amphibians and other aquatic animals is considered low. Any potential chronic toxicity of concern would be short lived due to dissipation in the environment. Acute and chronic risks are further limited by the functional solubility of the product. These findings support the conclusion that the proposed use of ProcellaCOR EC under ANCP applications at application rates of 3 – 5 PDUs / per acre-foot pose an acceptable risk to the non-target aquatic biota and environment.