



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION



JANET T. MILLS
GOVERNOR

GERALD D. REID
COMMISSIONER

June 3, 2019

TO: Interested Parties of Record

*Sent via electronic mail
Delivery confirmation requested*

**RE: *Maine Pollutant Discharge Elimination System (MEPDES) Permit #MEG150000
Maine Waste Discharge License (WDL) #W009004-5Y-D-M
Finalized General Permit - Modification***

Dear Interested Party:

Attached, please find the Finalized General Permit Modification for Maine Pollutant Discharge Elimination System General Permit #MEG150000 – Application of Herbicides for the Control of Invasive Aquatic Plants.

Any interested person aggrieved by a Department determination made pursuant to applicable regulations, may appeal the decision following the procedures described in the attached DEP FACT SHEET entitled “*Appealing a Commissioner’s Licensing Decision.*”

Thank you for your efforts to protect and improve the waters of the great state of Maine!

Sincerely,

Cindy L. Dionne
Division of Water Quality Management
Bureau of Water Quality
ph: 207-287-7823

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Enc.

cc: Barry Mower, DEP
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Richard Carvalho, USEPA
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DEP INFORMATION SHEET

Appealing a Department Licensing Decision

Dated: November 2018

Contact: (207) 287-2452

SUMMARY

There are two methods available to an aggrieved person seeking to appeal a licensing decision made by the Department of Environmental Protection's (DEP) Commissioner: (1) an administrative process before the Board of Environmental Protection (Board); or (2) a judicial process before Maine's Superior Court. An aggrieved person seeking review of a licensing decision over which the Board had original jurisdiction may seek judicial review in Maine's Superior Court.

A judicial appeal of final action by the Commissioner or the Board regarding an application for an expedited wind energy development (35-A M.R.S. § 3451(4)) or a general permit for an offshore wind energy demonstration project (38 M.R.S. § 480-HH(1)) or a general permit for a tidal energy demonstration project (38 M.R.S. § 636-A) must be taken to the Supreme Judicial Court sitting as the Law Court.

This information sheet, in conjunction with a review of the statutory and regulatory provisions referred to herein, can help a person to understand his or her rights and obligations in filing an administrative or judicial appeal.

I. ADMINISTRATIVE APPEALS TO THE BOARD

LEGAL REFERENCES

The laws concerning the DEP's *Organization and Powers*, 38 M.R.S. §§ 341-D(4) & 346; the *Maine Administrative Procedure Act*, 5 M.R.S. § 11001; and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 C.M.R. ch. 2.

DEADLINE TO SUBMIT AN APPEAL TO THE BOARD

The Board must receive a written appeal within 30 days of the date on which the Commissioner's decision was filed with the Board. Appeals filed more than 30 calendar days after the date on which the Commissioner's decision was filed with the Board will be dismissed unless notice of the Commissioner's license decision was required to be given to the person filing an appeal (appellant) and the notice was not given as required.

HOW TO SUBMIT AN APPEAL TO THE BOARD

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017. An appeal may be submitted by fax or e-mail if it contains a scanned original signature. It is recommended that a faxed or e-mailed appeal be followed by the submittal of mailed original paper documents. The complete appeal, including any attachments, must be received at DEP's offices in Augusta on or before 5:00 PM on the due date; materials received after 5:00 pm are not considered received until the following day. The risk of material not being received in a timely manner is on the sender, regardless of the method used. The appellant must also send a copy of the appeal documents to the Commissioner of the DEP; the applicant (if the appellant is not the applicant in the license proceeding at issue); and if a hearing was held on the application, any intervenor in that hearing process. All of the information listed in the next section of this information sheet must be submitted at the time the appeal is filed.

INFORMATION APPEAL PAPERWORK MUST CONTAIN

Appeal materials must contain the following information at the time the appeal is submitted:

1. *Aggrieved Status.* The appeal must explain how the appellant has standing to maintain an appeal. This requires an explanation of how the appellant may suffer a particularized injury as a result of the Commissioner's decision.
2. *The findings, conclusions, or conditions objected to or believed to be in error.* The appeal must identify the specific findings of fact, conclusions regarding compliance with the law, license conditions, or other aspects of the written license decision or of the license review process that the appellant objects to or believes to be in error.
3. *The basis of the objections or challenge.* For the objections identified in Item #2, the appeal must state why the appellant believes that the license decision is incorrect and should be modified or reversed. If possible, the appeal should cite specific evidence in the record or specific licensing requirements that the appellant believes were not properly considered or fully addressed.
4. *The remedy sought.* This can range from reversal of the Commissioner's decision on the license or permit to changes in specific permit conditions.
5. *All the matters to be contested.* The Board will limit its consideration to those matters specifically raised in the written notice of appeal.
6. *Request for hearing.* If the appellant wishes the Board to hold a public hearing on the appeal, a request for public hearing must be filed as part of the notice of appeal, and must include an offer of proof in accordance with Chapter 2. The Board will hear the arguments in favor of and in opposition to a hearing on the appeal and the presentations on the merits of an appeal at a regularly scheduled meeting. If the Board decides to hold a public hearing on an appeal, that hearing will then be scheduled for a later date.
7. *New or additional evidence to be offered.* If an appellant wants to provide evidence not previously provided to DEP staff during the DEP's review of the application, the request and the proposed evidence must be submitted with the appeal. The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered in an appeal only under very limited circumstances. The proposed evidence must be relevant and material, and (a) the person seeking to add information to the record must show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process; or (b) the evidence itself must be newly discovered and therefore unable to have been presented earlier in the process. Specific requirements for supplemental evidence are found in Chapter 2 § 24.

OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

1. *Be familiar with all relevant material in the DEP record.* A license application file is public information, subject to any applicable statutory exceptions, and is made easily accessible by the DEP. Upon request, the DEP will make application materials available during normal working hours, provide space to review the file, and provide an opportunity for photocopying materials. There is a charge for copies or copying services.
2. *Be familiar with the regulations and laws under which the application was processed, and the procedural rules governing your appeal.* DEP staff will provide this information on request and answer general questions regarding the appeal process.
3. *The filing of an appeal does not operate as a stay to any decision.* If a license has been granted and it has been appealed, the license normally remains in effect pending the processing of the appeal. Unless a stay of the decision is requested and granted, a license holder may proceed with a project pending the outcome of an appeal, but the license holder runs the risk of the decision being reversed or modified as a result of the appeal.

WHAT TO EXPECT ONCE YOU FILE A TIMELY APPEAL WITH THE BOARD

The Board will formally acknowledge receipt of an appeal, and will provide the name of the DEP project manager assigned to the specific appeal. The notice of appeal, any materials accepted by the Board Chair as supplementary evidence, any materials submitted in response to the appeal, and relevant excerpts from the DEP's application review file will be sent to Board members with a recommended decision from DEP staff. The appellant, the license holder if different from the appellant, and any interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. The appellant and the license holder will have an opportunity to address the Board at the Board meeting. With or without holding a public hearing, the Board may affirm, amend, or reverse a Commissioner decision or remand the matter to the Commissioner for further proceedings. The Board will notify the appellant, the license holder, and interested persons of its decision.

II. JUDICIAL APPEALS

Maine law generally allows aggrieved persons to appeal final Commissioner or Board licensing decisions to Maine's Superior Court (see 38 M.R.S. § 346(1); 06-096 C.M.R. ch. 2; 5 M.R.S. § 11001; and M.R. Civ. P. 80C). A party's appeal must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other person, an appeal must be filed within 40 days of the date the decision was rendered. An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S. § 346(4).

Maine's Administrative Procedure Act, DEP statutes governing a particular matter, and the Maine Rules of Civil Procedure must be consulted for the substantive and procedural details applicable to judicial appeals.

ADDITIONAL INFORMATION

If you have questions or need additional information on the appeal process, for administrative appeals contact the Board's Executive Analyst at (207) 287-2452, or for judicial appeals contact the court clerk's office in which your appeal will be filed.

Note: The DEP provides this INFORMATION SHEET for general guidance only; it is not intended for use as a legal reference. Maine law governs an appellant's rights.



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION
17 STATE HOUSE STATION AUGUSTA, MAINE 04333-0017

DEPARTMENT ORDER

IN THE MATTER OF

GENERAL PERMIT) MAINE POLLUTANT DISCHARGE
HERBICIDES FOR THE CONTROL) ELIMINATION SYSTEM PERMIT
OF INVASIVE AQUATIC PLANTS)
STATE OF MAINE) AND
#W-009004-5Y-D-M) WASTE DISCHARGE LICENSE
#MEG150000) MODIFICATION
APPROVAL)

In compliance with the applicable provisions of *Pollution Control*, 38 M.R.S. §§ 411 – 424-B, *Water Classification Program*, 38 M.R.S. §§ 464 – 470 and *Federal Water Pollution Control Act*, Title 33 U.S.C. § 1251, and applicable rules of the Maine Department of Environmental Protection (Department), the Department hereby modifies Maine Pollutant Discharge Elimination System (MEPDES) General Permit (GP) #MEG150000 / Maine Waste Discharge License (WDL) #W009004-5Y-C-R, issued by the Department on April 3, 2017 for a five-year term, with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

PERMIT MODIFICATION SUMMARY

The Department is modifying the appropriate Special Conditions as well as amending Attachment A to include floryprauxifen-benzyl as an authorized aquatic herbicide to control invasive aquatic plant species.

CONCLUSIONS

Based on the findings in the attached Fact Sheet, dated June 3, 2019, and subject to the conditions listed in General and Special Conditions of the permit modification and the April 3, 2017 General Permit, the Department makes the following CONCLUSIONS:

1. The discharge(s) covered under this GP, either by itself or in combination with other discharges, will not lower the quality of any classified body of water below such classification.
2. The discharge(s) covered under this GP, either by itself or in combination with other discharges, will not lower the quality of any unclassified body of water below the classification which the Department expects to adopt in accordance with state law.
3. The provisions of the State's antidegradation policy, *Water Classification Program*, 38 M.R.S. §464(4)(F), will be met, in that:
 - (a) Existing in-stream water uses and the level of water quality necessary to protect and maintain those existing uses will be maintained and protected;
 - (b) Where high quality waters of the State constitute an outstanding national resource, that water quality will be maintained and protected;
 - (c) Where the standards of classification of the receiving water body are not met, the discharge will not cause or contribute to the failure of the water body to meet the standards of classification;
 - (d) Where the actual quality of any classified receiving water body exceeds the minimum standards of the next highest classification that higher water quality will be maintained and protected; and
 - (e) Where a discharge will result in lowering the existing water quality of any water body, the Department has made the finding, following opportunity for public participation, that this action is necessary to achieve important economic or social benefits to the State.
4. The discharge will be subject to effluent limitations that require application of best practicable treatment (BPT) as defined in *Conditions of licenses*, 38 M.R.S. §414-A(1)(D).
5. The discharge of authorized aquatic herbicides in accordance with the terms and conditions of this general permit will provide adequate protection of non-target species.
6. The discharge of authorized aquatic herbicides in accordance with the terms and conditions of this GP will not have a significant adverse effect on receiving water quality or violate the standards of the receiving water's classification.

ACTION

Based on the findings and conclusions as stated above, the Department hereby MODIFIES General Permit #MEG150000, *Application of Herbicides For The Control Of Invasive Aquatic Plants* issued by the Department on April 3, 2017 for Class GPA, Class AA, A, B, and C waters, tributaries to Class GPA waters, and those waters having drainage areas of less than ten square miles, that contain populations of invasive aquatic plants, SUBJECT TO THE ATTACHED CONDITIONS, including:

1. The attached General Conditions included as Part I of the April 3, 2017 GP.
2. The attached General Conditions included as Part II of the April 3, 2017 GP.
3. "*Maine Pollutant Discharge Elimination System Permit Standard Conditions Applicable To All Permits*", revised July 1, 2002, copy attached.
4. All terms and conditions in combination WDL #W009004-5Y-C-R / MEPDES permit #MEG150000, dated April 3, 2017, not modified by this permitting action remain in effect and enforceable.
5. This General Permit modification expires on April 3, 2022, concurrent with the April 3, 2017 MEPDES General Permit. Prior to expiration of the April 3, 2017 General Permit, the Department will make a determination if it is to be renewed, and, if so, will commence renewal proceedings. If the General Permit is to be renewed, the April 3, 2017 General Permit will remain in force until the Department takes final action on the renewal. *General Permits for Certain Wastewater Discharges*, 06-096 CMR 529 (last amended June 27, 2007) and *Maine Administrative Procedure Act*, 5 M.R.S. § 10002 and *Rules Concerning the Processing of Applications and Other Administrative Matters*, 06-096 C.M.R. 2(21)(A) (amended June 9, 2018).

DONE AND DATED AT AUGUSTA, MAINE, THIS 3 DAY OF June 2019.

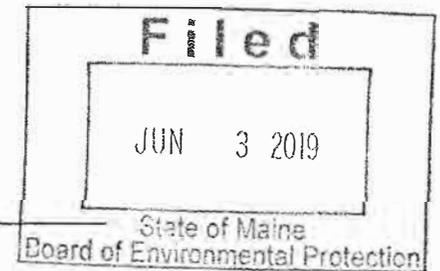
DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: 
For Gerald D. Reid, Commissioner

Date of Public Notice: On or about April 22, 2019

Date filed with Board of Environmental Protection _____

This Order prepared by Cindy L. Dionne, Bureau of Water Quality
MEG150000



PART I – SPECIAL CONDITIONS

B. SPECIALIZED DEFINITIONS

In addition to the definitions found in *Definitions for the Waste Discharge Permitting Program* 06-096 C.M.R. 520 (effective January 12, 2001) and in the waste discharge and water classification laws, the following terms have the following meanings when used in this GP.

1. **Authorized Aquatic Herbicide.** “Authorized aquatic herbicide” means granular, solid, powder, liquid, or other formulations of herbicides whose sole active ingredients are registered with both the USEPA and Maine Board of Pesticides Control (BPC) and are applied in accordance with USEPA approved label used by a licensed applicator to inhibit the growth or control invasive aquatic plants.

Specifically, the formulations that may be used under this permit are those below or successor formulations with substantially the same constituents. If new formulations replace these listed below, the Notice of Intent (NOI) will include those formulations proposed for use, their specifications, and information sufficient to allow the Department to conclude that conditions and safeguards in this permit will be met.

- f) **Florpyrauxifen-benzyl:** Florpyrauxifen-benzyl (EPA Chemcode 30093; CAS Registry #1390661-72-9)

D. DISCHARGE CONCENTRATION LIMITS

In conducting an approved invasive aquatic plant treatment program, herbicide concentrations developed in the waterbody may at no time exceed USEPA approved label rates. As it is routine practice in integrated pest management, lesser rates which achieve treatment efficacy will be applied to protect non-target organisms and resources.

Table 1. Maximum volume-weighted concentration for authorized herbicides.

Herbicides	2, 4-D	Diquat	Endothall	Fluridone	Fluridone	Triclopyr	Florpyrauxifen-benzyl
Formulation	Liquid or Solid AE	Liquid or Cation Equivalent	Liquid or Solid AE	Liquid AE	Solid AE	Liquid or Solid AE	Liquid
Maximum Permit Concentration	4.00 ppm	0.37 ppm	5.00 ppm	0.150 ppm	0.075 ppm	2.50 ppm	0.048 ppm (25 PDU/acre-ft)

Footnotes: AE = Acid Equivalent, ppm = parts per million, PDU=Prescription Dose Unit.

PART I – SPECIAL CONDITIONS

E. MONITORING

Table 2. Required herbicide sampling type and frequency for whole lake and spot treatments, unless otherwise specified in the NOI. Mid-water column sample depth for the first sample will be based on treatment type and thermal profile at the deep hole or within the treated area for spot treatments. Treatments in very shallow water (e.g., ≤ 1 meter) may not require multiple depth samples to characterize concentrations.

Herbicide	First Sample(s)	Second Sample	Ongoing Until Sampling Endpoint Specified
2, 4-D: Liquid and granular (solid) formulations	Within 24 (liquid) or 72 hours (granular) of initial treatment: <ul style="list-style-type: none"> • 0.5 m below surface grab • mid-water column grab • 1 m off bottom grab 	5-14 days after first sample: Liquid: 0.5 m below surface grab or representative water column composite Granular: 1 m off bottom grab	Monthly after 2nd sample: 0.5 m below surface grab or representative water column composite
Diquat dibromide: Liquid formulation	Within 24 hours of initial treatment: <ul style="list-style-type: none"> • 0.5 m below surface grab • mid-water column grab • 1 m off bottom grab 	5-14 days after first sample: 0.5 m below surface grab or representative water column composite	Monthly after 2nd sample: 0.5 m below surface grab or representative water column composite
Endothall Liquid and granular (solid) formulations	Within 24 (liquid) or 72 hours (granular) of initial treatment: <ul style="list-style-type: none"> • 0.5 m below surface grab • mid-water column grab • 1 m off bottom grab 	5-14 days after first sample: Liquid: 0.5 m below surface grab or representative water column composite Granular: 1 m off bottom grab	Monthly after 2nd sample: 0.5 m below surface grab or representative water column composite
Fluridone: Liquid and granular (solid) formulations	Within 72 hours of initial treatment: <ul style="list-style-type: none"> • 0.5 m below surface grab • mid-water column grab • 1 m off bottom grab 	5-14 days after first sample: Liquid: 0.5 m below surface grab or representative water column composite Granular: 1 m off bottom grab	Monthly after 2nd sample: 0.5 m below surface grab or representative water column composite
Triclopyr Liquid and granular (solid) formulations	Within 24 (liquid) or 72 hours (granular) of initial treatment: <ul style="list-style-type: none"> • 0.5 m below surface grab • mid-water column grab • 1 m off bottom grab 	5-14 days after first sample: Liquid: 0.5 m below surface grab or representative water column composite Granular: 1 m off bottom grab	Monthly after 2nd sample: 0.5 m below surface grab or representative water column composite
Florpyrauxifen-benzyl	Within 24 hours of initial treatment: <ul style="list-style-type: none"> • 0.5 m below surface grab • mid-water column grab • 1 m off bottom grab 	5-14 days after first sample: 0.5 m below surface grab or representative water column composite	Monthly after 2nd sample: 0.5 m below surface grab or representative water column composite

PART I – SPECIAL CONDITIONS

E. MONITORING (cont'd)

- c. **Outlet Monitoring.** Outlet monitoring is required when a whole lake treatment is performed and there is outflow during the time of target application concentrations. If there is outflow, one grab sample must be collected on the same frequency specified in Table 2 for whole lake treatment monitoring. The sampling location will be designated on a map submitted with the NOI and will be representative of downstream conditions.

Unless specified in the NOI due to proximity to the outlet, outlet monitoring is not required for spot or area treatment as the extensive dilution within the receiving water is anticipated to result in no release of effective or biologically active herbicide concentrations downstream.

- d. **Duration of Herbicide Monitoring.** Monitoring is started based on the initial annual herbicide application and continues pursuant to Table 2 based on that initial event, regardless of the presence or number of booster treatments administered. Monitoring must continue until the concentration falls below the laboratory reporting limit, to an alternate Department-specified sampling endpoint defined herein, or annually to ice-in, or through November in each year that treatment occurs, whichever comes first. If the concentration does not fall below the laboratory reporting limit or the pesticide-specific sampling endpoint is not reached by ice-in or the end of November, monitoring will be suspended over winter.

Monitoring will resume within one month of ice-out in the following spring and will continue every month until the concentration falls below the laboratory reporting limit, reaches the pesticide-specific sampling endpoint, or until re-treatment occurs. If retreatment occurs in a new calendar year, the IASP must resume monitoring pursuant to Table 2, beginning with the requirements for first samples. Laboratory reporting limits may vary over time. This GP requires that the IASP utilize laboratory reporting limits current at the time of sampling.

**MAINE POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT
AND
WASTE DISCHARGE LICENSE**

FINAL FACT SHEET

Date: **June 3, 2019**

GENERAL PERMIT NUMBER: **MEG150000**
WASTE DISCHARGE LICENSE: **W009004-5Y-D-M**

**GENERAL PERMIT MODIFICATION FOR THE APPLICATION OF HERBICIDES
FOR THE CONTROL OF INVASIVE AQUATIC PLANTS**

AREA OF COVERAGE AND RECEIVING WATER CLASSIFICATION:

**STATEWIDE CLASS GPA, CLASS AA, A, B, AND C WATERS, TRIBUTARIES TO
CLASS GPA WATERS, AND THOSE WATERS HAVING DRAINAGE AREAS OF LESS
THAN TEN SQUARE MILES, THAT CONTAIN POPULATIONS OF INVASIVE
AQUATIC PLANTS**

DEPARTMENT CONTACT

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A. PERMIT MODIFICATION SUMMARY

The Department of Environmental Protection (Department) is modifying the appropriate Special Conditions as well as amending Attachment A to include floryprauxifen-benzyl as an authorized aquatic herbicide to control invasive aquatic plant species.

B. PROCEDURAL

The Department issued combination Maine Pollutant Discharge Elimination System (MEPDES) General Permit (GP) #MEG150000 / Maine Waste Discharge License (WDL) #W009004-5Y-C-R, on April 3, 2017 for a five-year term. During calendar year 2018, the Department recognized that an additional herbicide treatment would be effective in the control of invasive aquatic plant species and should be included in the General Permit.

Pursuant to 06-096 CMR 522(3)(c)(2), only those conditions being modified in this permitting action will be reopened. All other terms and conditions not modified by this permitting action remain in effect and enforceable.

G. CONCENTRATIONS OF AUTHORIZED AQUATIC HERBICIDES

Typical herbicide concentrations and target durations of exposure along with highest rates allowed in this permit are specified in Table 1 of this Fact Sheet. As it is routine practice in integrated pest management, lesser rates which achieve treatment efficacy will be applied to protect non-target organisms and resources. In all cases, the permitted rate never exceeds the maximum USEPA approved label rate, and in most cases, the treatment concentration will be chosen in consultation with treatment contractors. However, the actual concentrations chosen need to be adequate to achieve significant control of the target species. Failure to do this may defeat the purpose of the applications and possibly invite environmental damage from more aggressive management that may be needed if the initial infestation is not reduced in a timely manner.

The following table provides the maximum USEPA approved label rate, and typical ranges of concentrations and treatment days for each of the currently listed invasive aquatic plants in Maine. Concentrations are in parts per million (ppm) and are volume-weighted.

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PART III - FACT SHEET

G. CONCENTRATIONS OF AUTHORIZED AQUATIC HERBICIDES (cont'd)

Table 1. Typical Herbicide Concentrations and Target Exposures for Control of Invasive Aquatic Plants

Authorized Aquatic Herbicides	2, 4-D AE		Diquat CE		Endothall AE		Fluridone AE (liquid)		Fluridone AE (solid)		Triclopyr AE		Florpyrauxifen-benzyl	
Maximum General Permit & USEPA Label Rate	4.0 ppm		0.37 ppm		5.0 ppm		0.150 ppm		0.075 ppm (0.150 Season Σ)		2.5 ppm		0.048 ppm (25 PDU/A-ft)	
	Typical Conc. (ppm)	Target Exposure Days	Typical Conc. (ppm)	Target Exposure Days	Typical Conc. (ppm)	Target Exposure Days	Typical Conc. (ppm)	Target Exposure Days	Typical Conc. (ppm)	Target Exposure Days	Typical Conc. (ppm)	Target Exposure Days	Typical Conc. (ppm)	Target Exposure Days
Eurasian water milfoil	0.5-2.0	1-3	0.1-0.2	TBD	2-4	0.5-2.0	0.006-0.015	>90-120	0.006-0.015	>90-120	0.5 - < 2.5	<3 - 0.75	0.0039 - 0.0077 (2-4 PDU/A-ft)	0.5-1
Variable-leaf water milfoil	0.5-2.0	1-3	0.1-0.2	3	2-4	0.5-2.0	0.01-0.02	>90-100	0.01-0.02	>90-100	0.5 - < 2.5	<3 - 0.75	0.0039 - 0.0097 (2-5 PDU/A-ft)	0.5-1
Parrot feather	< 4.0	TBD	< 0.35	TBD	2-4	0.5-2.0	< 0.050	TBD	< 0.060	TBD	0.75 to < 1.5 **	1-2**	0.0039 - 0.0097 (3-5 PDU/A-ft)	0.5-2
Water chestnut	3.0-4.0	1	< 0.35	TBD	TBD	TBD	< 0.050	TBD	< 0.060	TBD	TBD	TBD	TBD	TBD
Hydrilla	< 4.0	TBD	< 0.35	TBD	2-4	0.5-2.0	0.005-0.03	>90-100	0.005-0.03	>90-100	N/A*	TBD	TBD	TBD
Fanwort	< 4.0	TBD	< 0.35	TBD	TBD	TBD	0.01-0.03	>90-150	0.01-0.03	>90-150	TBD	TBD	TBD	TBD
Curly-leaved pondweed	< 4.0	TBD	0.1-0.2	3	0.5-3	0.5-2.0	0.006-0.03	> 60	0.006-0.03	> 60	TBD	TBD	TBD	TBD
European naiad	< 4.0	TBD	0.1-0.2	3	1-4	0.5-2.0	0.006-0.03	> 60	0.006-0.03	> 60	N/A*	TBD	TBD	TBD
Brazilian elodea	< 4.0	TBD	0.1-0.2	3	TBD	TBD	0.01-0.03	>70-84	0.01-0.03	>70-84	N/A*	TBD	TBD	TBD
Frogbit	< 4.0	TBD	< 0.35	TBD	TBD	TBD	< 0.050	TBD	< 0.060	TBD	N/A*	TBD	TBD	TBD
Yellow floating heart	3.0-4.0	1	< 0.35	TBD	TBD	TBD	< 0.050	TBD	< 0.060	TBD	TBD	TBD	0.0097 - 0.029 (5-15 PDU/A-ft)	1 - 3
Plant species designated by the Department	< 4.0	TBD	< 0.35	TBD	TBD	TBD	< 0.050	TBD	< 0.060	TBD	TBD	TBD	TBD	TBD

PART III - FACT SHEET

G. CONCENTRATIONS OF AUTHORIZED AQUATIC HERBICIDES (cont'd)

Footnotes to Table 1:

ppm=parts per million; PDU = Prescription Dose Unit; A-ft=acre-foot

N/A* = Monocot species; probably not effective

** Based on one review (11) with limited data on duration of exposure. Concentrations based on mean depth= 4 ft and label rates. Probable that in the field application rates should be comparable to other *Myriophyllums*.

TBD = to be determined, as field data are limited. The target duration days for these species are usually equal to the maximum duration for other invasive species listed.

Concentrations are given as acid equivalents (ae) for Fluridone, 2, 4-D, Triclopyr, and Endothall and as cation equivalents (CE) for Diquat dibromide.

Concentrations designated at maximum permit rates are those for which limited target concentration data is available. Those herbicides are less likely to be used than other products with a proven track record.

Target duration days refers to the recommended number of days of exposure at the typical herbicide concentration listed to ensure efficacy.

H. DESCRIPTION OF AUTHORIZED AQUATIC HERBICIDES

1. This GP authorizes the application (discharge) of granular, solid, powder, liquid or other formulations of herbicides as described in the following sections on Fluridone, Diquat dibromide, 2, 4-D, Endothall, and Triclopyr. Specifically, the formulations that may be used under this permit are those below, or successor formulations with substantially the same constituents. From time to time, formulations may be re-registered or minor modifications, including product names, may be made subject to USEPA and BPC registration.

- a) **2, 4-Dichlorophenoxyactetic acid (2, 4-D) derivatives:**
Dimethylamine salt, 2, 4-Dichlorophenoxyacetate, 2, 4-D DMA salt, (USEPA Chemcode 30019; CAS Registry # 1929-73-3)
- b) **Diquat:**
Diquat dibromide (USEPA Chemcode 32201; CAS Registry # 85-00-7);
- c) **Endothall:**
Endothall dipotassium salt (7-oxabicyclo [2, 2, 1] heptane-2, 3-dicarboxylic dipotassium salt) (USEPA Chemcode 38904; CAS Registry # 2164-07-0)

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H. DESCRIPTION OF AUTHORIZED AQUATIC HERBICIDES

- d) **Fluridone:**
Fluridone (USEPA Chemcode CAS Registry # 59756-60-4)

- e) **Triclopyr:**
Triethylamine salt (TEA) (USEPA Chemcode 116002;
CAS Registry #: 57213-69-1)

- f) **Florpyrauxifen-benzyl:**
Florpyrauxifen-benzyl (EPA Chemcode 30093;
CAS Registry #1390661-72-9)

I. MONITORING AND REPORTING REQUIREMENTS

This GP requires monitoring of herbicide concentrations, water quality, plant communities, and non-target fauna, as described below. The monitoring requirements included herein constitute minimum monitoring requirements. Additional monitoring will be based on waterbody specific and treatment specific conditions and properties and will be specified in the NOI as needed. The IASP's monitoring plans must also consider information received from consultation with the DIFW, DACF Natural Areas Program, and other resource agencies and organizations.

1. Herbicide Monitoring: Herbicide monitoring is typically done to ensure that permit limits are not exceeded, to assure that target concentrations are met (or maintained in the event that booster treatments are required to maintain residuals over time), to determine when to re-apply (booster treatments), or to assess when concentrations drop below levels that will have an effect on plant populations. Detection methods are established by USEPA methods (2, 4-D, Diquat dibromide, Endothall, and Triclopyr) or by proprietary test methods (Fluridone and Florpyrauxifen-benzyl).

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I. MONITORING AND REPORTING REQUIREMENTS (cont'd)

Diquat dibromide and Florpyrauxifen-benzyl have only liquid formulations while Fluridone, 2, 4-D, Triclopyr, and Endothall have both liquid and granular formulations. Depending on the product used, the maximum concentration of herbicide may occur at varying depths within the water column. To ensure homogeneous mixing of the herbicide and detection of the maximum instantaneous concentration, the first post treatment sampling for herbicide concentration will include surface, bottom, and mid-water column grab samples unless the water column is too shallow to require multiple samples to characterize concentrations. Complete mixing may take up to several days but, due to the fast-acting nature of the herbicides, samples for Diquat dibromide and Florpyrauxifen-benzyl, as well as samples for liquid formulations of 2, 4-D, Triclopyr, and Endothall will be collected within 24 hours of initial treatment. Granular treatments of 2, 4-D, Triclopyr, and Endothall and will be collected within 72 hours, reflecting delayed release times needed for active concentrations to develop. Fluridone (liquid or granular) will be sampled within 72 hours of initial treatment since this herbicide is more persistent than the others. Thermal profiles will be used to determine the location of the mid-water column grab sample.

The second post treatment samples reflect the tendency for maximum concentrations for liquid and granular formulations to be near the surface and near the bottom, respectively. Monthly samples following the second post treatment samples (subsurface grab or representative water column composite) assume homogenous mixing whether liquid or granular formulation is used.

The standard monitoring location for whole-lake treatments must be the lake deep hole (deepest point in defined basin(s)). For spot or area treatments, herbicide sampling must occur within the treated area at a location representative of the characteristics (depth, density of plant growth, substrate) of the treated area. However, multiple spot or area treatments will require no more than 3 representative areas monitored.

Outlet monitoring is required when a whole lake treatment is performed and there is outflow during the time of effective herbicide concentrations. If there is outflow, one grab sample must be collected on the same frequency as specified for whole-lake treatment monitoring. Sampling locations will be representative of downstream conditions. Unless specified in the NOI due to proximity to the outlet, outlet monitoring is not required for spot or area treatment as the extensive dilution within the receiving water is anticipated to result in no release of effective or biologically active herbicide concentrations downstream.

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I. MONITORING AND REPORTING REQUIREMENTS (cont'd)

Monitoring is started based on the initial annual herbicide application and continues pursuant to prescribed requirements regardless of the presence or number of booster treatments administered. Monitoring must continue until the herbicide concentration falls below the laboratory reporting limit, to an alternate Department-specified sampling endpoint defined herein, or annually to ice-in, or through November in each year that treatment occurs, whichever comes first. If the concentration does not fall below the laboratory reporting limit or the pesticide-specific sampling endpoint is not reached by ice-in or the end of November, monitoring will be suspended over winter.

Monitoring will resume within one month of ice-out in the following spring and will continue every month until the concentration falls below the laboratory reporting limit, reaches the pesticide-specific sampling endpoint, or until re-treatment occurs. If retreatment occurs in a new calendar year, the IASP must resume monitoring pursuant to Table 2, beginning with the requirements for first samples. Laboratory reporting limits may vary over time. This GP requires that the IASP utilize laboratory reporting limits current at the time of sampling. Herbicide concentration monitoring requirements are described in GP Table 2.

2. Water Quality Monitoring: The primary need to do lake water quality monitoring is to detect whether there are increases in total phosphorus which can be obviously associated with releases from dying plants. Also, abnormally low Secchi disk transparencies (algae response to increased nutrients) or low dissolved oxygen beyond conditions typically expected in the waterbody, which may be due to plant decay, may be detected. Data taken as part of the treatment project will be compared to pre-treatment data, if available, to determine evidence of water quality impacts due to the treatment. Numerous field studies have recorded such shifts in water quality. Commonly, upon return to more natural plant densities, water quality returns to pre-treatment conditions, usually within a year or two. Longer term reductions in formerly high density plant biomass may result in more persistent planktonic algae increases, since the nutrients normally sequestered in high density invasive plant populations are available for re-cycling in the lake system. Most lake systems so affected usually return to lower productivity status after several seasons of lake flushing and sediment absorption /precipitation of nutrients. See Section L of this Fact Sheet.

When required under this permit, lake water quality monitoring will be conducted twice per season, typically timed to entail pre and post treatment, during years when a lake is treated. Monitoring will include temperature-oxygen profile, Secchi disk transparency, and total phosphorous according to the Department's Standard Field Methods for Lake Water Quality Monitoring. Monitoring locations for whole-lake treatments will be in a representative deep water location, usually the deepest area of the treated basin. Similar monitoring will be done for spot treatments only if the total area treated exceeds 25% of the lake surface area or if hydrologic conditions suggest potential for dissolved oxygen (DO) depletion. In the latter case, sampling may be done within the treated area as appropriate.

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I. MONITORING AND REPORTING REQUIREMENTS (cont'd)

3. Plant Community Monitoring: Plant community monitoring is conducted for two basic reasons: to assess the success of control on the target population(s) and to assess effects of treatment on the plant community as a whole. There are many ways to monitor plant populations, ranging from simple physical examination and field identification of plants to very labor-intensive quantitative sampling.

The point-intercept method, as described in Madsen (2000), involves obtaining samples of plants growing at several spots in the area of interest based on a geographic positioning system (GPS) grid. The IASP has employed this method in past herbicide treatments, and uses a toothed grapnel or rake on a line to remove samples of plants from the bottom in areas likely to contain plant populations. This allows for identifying plant species and their relative abundance based on how many times a species is found. The number of points sampled can range significantly depending on the degree of precision needed. In general, as few as 20-40 samples in whole lake treatments should give a good representation of plant diversity and relative numbers. Depending on the size of the waterbody, the distance between sampling points is anticipated to be approximately 100 meters. The number of sampling points in spot treatments will vary depending on the size of the treated area. For very small treatment areas (e.g., 25 m²) only 1 or 2 sampling points will suffice, while larger spot treatments may require up to 5 sampling points to characterize the plant community pre and post treatment. Multiple spot or area treatments on a waterbody will require plant monitoring in no more than 3 treatment areas.

On a case specific basis, other commonly accepted means of plant monitoring may be preferable including quadrat or transect monitoring and visual surveys, by diver or from the surface, of sufficient scope to give reliable, though semi-quantitative, plant community assessment. Observations using submersible cameras and divers can add knowledge in areas where plants are in sparse or in deep waters for qualitative evaluations.

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I. MONITORING AND REPORTING REQUIREMENTS (cont'd)

This sampling must occur before treatment and during the growing season at a time likely to give good community representation, when possible. Annual monitoring of the target species must be done to assess treatment efficacy and may use one or more of the following methods for whole lake treatments: point intercept survey, diver survey, underwater camera, or surface observations. Point intercept surveys will be used for spot treatments. IASP experience on Pickerel Pond in Limerick (#ME0090670 / #W-8156-5U-B-R) and Pleasant Hill in Scarborough (#MEU508221 / #W-8221-5U-A-N) reveals that annual monitoring of non-target species during a multi-year treatment program does not provide significant additional information. Four years of annual non-target plant monitoring during the Pickerel Pond treatment program resulted in very similar patterns each year, i.e., most of the same non-targets are killed year after year. The real question is what plants will grow back once the herbicide treatment program ends. Monitoring of target and non-target plant species should be done during the growing season in the year after the last treatment to assess efficacy of control of the target plant(s) and reductions or potential loss of non-target species. This information, coupled with other qualitative observations, allows planning for follow-up manual or mechanical control methods.

In contrast, plant monitoring in outlet streams can usually be done from shore or wading, and semi-quantitative methods such as point intercept are not needed. The objective is to determine what plant species are present and a qualitative evaluation of relative abundance. Follow-up monitoring determines if there is obvious plant damage (often exhibited by chlorosis) from herbicide residuals in the outflow. Observations are also conducted for the presence of, and effects on, rare or threatened species.

In the event of only spot treatments in a waterbody, plant monitoring in the outlet stream will not be conducted due to the dilution by the volume of untreated lake water. The IASP will, however, conduct visual observations in the outlet stream for chlorosis on plants to ensure that there is no evidence of effect on downstream plants.

4. Non-target Fauna Observations: The IASP will also conduct visual observations in the waterbody and outlet throughout the treatment program for treatment-related effects on macroinvertebrates, fish, and other aquatic organisms and report the occurrence and significance of any adverse findings within 24-hours. The IASP and the Department must evaluate the occurrence and determine an appropriate course of action.

Monitoring results of herbicide concentrations must be reported to the Department quarterly, while the results of monitoring for water quality, plant communities, and non-target fauna must be reported to the Department annually, as described in General Permit Part I.F.

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J. PUBLIC HEALTH CONCERNS AND RISK REDUCTION

Aquatic herbicides covered under this permit have been reviewed by the USEPA during the registration process. USEPA considered studies on human exposure as well as laboratory and field studies of both acute and chronic effects on animals. The labels set limits that are unlikely to pose risk to humans given normal behavior such as swimming and using very conservative assumptions as to exposure and duration of herbicides in the environment.

At least two states, Massachusetts in 2004 and Washington during 2000-2004, published extensive reviews of environmental fate and effects of herbicides. These included reviews of human health effects of numerous herbicides, including those covered in this permit except for Florpyrauxifen-benzyl which is a recently-registered herbicide with more recently-released reviews. Information in these reviews as well as USEPA documents were consulted when setting target concentrations as well as safeguards for human health, non-target species, and habitat.

At the request of the Department, staff of the BPC also performed a review of these herbicides and considered if Maximum Exposure Guidelines (MEGs) should be revised or established. They were requested to consider the human health effects of herbicide use at the maximum label rates as well as the more likely rates proposed in this permit. The results of the BPC reviews are summarized in Fact Sheet Attachment A. In general, even at the maximum label rates, human health effects were considered extremely unlikely given the treatment scenarios allowed.

While the highest rates in this permit are equivalent to the USEPA approved label rates, the lowest rate and shortest duration of exposure required to achieve treatment efficacy will be used to protect non-target organisms and resources. Herbicide labels specify use restrictions such as in drinking water or plant irrigation. In all cases IASP follows safety and notice precautions as prescribed or is more stringent than label requirements.

P. PUBLIC COMMENTS

Public notice of this GP was made in the Bangor Daily News, Kennebec Journal, and Portland Press Herald newspapers on or about April 4, 2019. The Department receives public comments on an application until the date a final agency action is taken on the application. Those persons receiving copies of draft permits must have at least 30 days in which to submit comments on the draft or to request a public hearing, pursuant to 06-096 CMR 522 of the Department's rules.

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Q. DEPARTMENT CONTACTS

Additional information concerning this licensing action may be obtained from and written comments should be sent to:

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Bureau of Water Quality
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R. RESPONSE TO COMMENTS

During the period of April 24, 2019 through the issuance date of the final permit modification, the Department solicited comments on the Proposed draft MEPDES permit to be issued for the proposed discharge. The Department did not receive comments that resulted in any substantive change(s) in the terms and conditions of the permit. Therefore, the Department has not prepared a Response to Comments.

ATTACHMENT A

(Properties and Potential Effects of Approved Aquatic Herbicides)

6. Florpyrauxifen-benzyl

- A. Typical formulations
- B. General Characteristics
- C. Typical Application Methods and Concentrations
 - 1. Concentrations
 - 2. Methods
 - 3. Restrictions and Operational Considerations
 - 4. Wildfowl and other animals; risk avoidance
 - 5. Water Supplies
 - 6. Recreational Use of Water in Treatment Area:
 - 7. Protection from Oxygen Loss/ fish avoidance:
 - 8. Persistence
- D. Human Health Considerations
- E. Potential Negative Effects
 - 1. Biomagnification/Bioconcentration
 - 2. Non-Target Plants
 - 3. Non-target animals
 - 4. Low Dissolved Oxygen
 - 5. Nutrient Release
 - 6. Drift to non-target areas

Most information and sections of the text in this summary are excerpted directly from review documents, product labels, and the like. Citations are referred to by numbers in parentheses. Particularly useful is the Final Supplemental Environmental Impact Statement for State of Washington Aquatic Plant and Algae Management from the Washington Department of Ecology which analyzes analyses of the potential environmental impacts of eight new herbicides, among them florpyrauxifen-benzyl. The Washington Ecology report was issued before registration and prior to release of EPA's Office of Pesticide Programs conducted human health and ecological risk assessments. The Washington Ecology report relied on data provided by Dow AgroSciences and SePRO Corporation. These companies worked in partnership to develop the technology for aquatic plant control. Other frequently cited references include USEPA studies and the product label. Few peer-reviewed publications are available on this product.

Fact Sheet Attachment A

6. Florpyrauxifen-benzyl

A. Typical Formulations

Florpyrauxifen-benzyl herbicide (2-pyridinecarboxylic acid, 4-amino-3-chloro-6-(4-chloro-2-fluoro-3-methoxyphenyl)- 5-fluoro-, phenyl methyl ester) is in a class of herbicides known as the arylpicolinates. The product registered for aquatic use in Maine, ProcellaCOR™ EC (Maine ID# 2018000796), is a liquid formulation. A separate product with this active ingredient, Rinskor™, is used in rice paddies.

B. General Characteristics

This herbicide is a relatively new product. Dow AgroSciences applied to EPA for registration in September 2015; registration was completed on in September 2017.

Physical/Chemical Properties of Florpyrauxifen-benzyl (XCE-848 Benzyl Ester) can be found on page 38 of reference 7.

Florpyrauxifen-benzyl is a synthetic auxin (plant hormone), one in a new class of synthetic auxins. This new class differs in binding affinity compared to other registered auxins. Like other synthetic auxins, florpyrauxifen-benzyl mimics the plant growth hormone in susceptible plants, causing excessive elongation in cells that ultimately kills the plant. Susceptible plants show abnormal growth and fragile tissue. Initial symptoms are seen within a few hours to a few days and plants typically are dead within a few weeks. Plants should be actively growing for effective results. Mature plants may require higher concentration and longer contact time than smaller plants (1, 4).

ProcellaCOR™ EC, the registered product with florpyrauxifen-benzyl, is a systemic herbicide for control of aquatic plants in slow-moving to quiescent freshwater systems. Invasive aquatic plants expected to be susceptible to this product include several species listed as invasive in Maine statute and currently found in Maine, including two species of milfoil (*Myriophyllum* spp) and hydrilla (*Hydrilla verticillata*) (2).

ProcellaCOR™ EC offers an alternative mode of action with a more favorable toxicological profile from currently registered products for controlling invasive aquatic plants (5). This herbicide requires a relatively short contact exposure time compared to other systemic herbicides, typically 12-24 hours, making it suitable for spot treatments in large water bodies, particularly in cases of rapid response to incipient infestations (4).

SePRO Corporation worked with partners and collaborators to conduct experimental applications to confirm efficacy and document non-target impacts (5). Trials using SePRO's ProcellaCOR™ EC to control variable milfoil (*Myriophyllum heterophyllum*) in New Hampshire have produced favorable results, i.e., substantial reduction in the target species with limited impact on non-target species (9).

C. Typical Application Methods and Concentrations

1. Concentrations

EPA's Final Registration Decision provides concentration information for foliar and in-water use, the latter being DEP's mode of use. The concentration for in-water use must be calculated. During one year, three applications are permitted with a maximum active ingredient concentration of 50 ppb per application. Should repeat applications be needed in the same season, 14 days is required between treatments (1).

The application rate is determined by Prescription Dose Units (PDU) per acre-foot of water with a maximum of three applications per year. For in-water applications, the maximum single application rate is 25.0 PDU. (2)

Trials show spot treatments of hydrilla and invasive water-milfoils can achieve desired control at rates of 10 to 50 µg active ingredient/liter ProcellaCOR™ EC compared with 1,000 to 5,000 µg/liter for endothall, 2,4-D and triclopyr (5).

2. Methods

For best results, applications should occur when plants are actively growing. Applications on mature plants may require higher rates and longer exposure time to be effective. Application for submersed weeds will usually be by subsurface injection from boats equipped with GPS location devices to ensure even areal application for liquid mixtures. This product can also be sprayed directly on emergent foliage of aquatic plants but DEP's likely target for this product will be submerged, not emergent, vegetation. Application methods for ProcellaCOR™ EC are consistent with those described in the General Permit (6).

3. Restrictions and Operational Considerations

There are no recreational use restrictions including swimming and fishing (2).

Use of ProcellaCOR™ EC must be managed to limit the potential for herbicide resistance developing in an invasive aquatic plant population. This product is classified in the Weed Science Society of America's Group 4, the synthetic auxins group. Plant populations may contain or develop biotypes that are resistant to herbicides in this group. Resistant biotypes may come to dominate a system after repeated use of herbicides with the same mode of action. ProcellaCOR™ EC is not recommended for use at the same site for more than 2 consecutive years (2). The DEPs primary objective for this product is for rapid response to incipient infestations which would likely require only one or two years of treatment accompanied by follow-up manual removal of plants not killed by the herbicide.

4. Wildfowl and other animals: risk avoidance

Risk to birds is described in detail in EPA's memo one on environmental fate and ecological risk assessment (reference 7). Although the exact acute Risk Quotient (RQ) values are not known, all RQ values are below EPA's Level of Concern (LOC). Since the RQ values are below the LOC, the acute risk is generally regarded as acceptable, including for piscivorous birds consuming organisms contaminated with flropyrauxifen-benzyl (7).

In determining chronic risk to birds, the dietary-based Estimated Environmental Concentration (EEC) was divided by the corresponding chronic toxicity endpoint, i.e., No Observed Adverse Effect Concentration, or NOAEC. The lowest available NOAEC of 398 mg active ingredient/kg-diet for bobwhite quail results in RQ values below the EPA's LOC of 1. Chronic risk to birds is therefore not indicated (7). The Washington State review of this chemical concluded that results indicate little to no toxicity of each avian species tested (5).

Acute RQ values for tested bees, reptiles, terrestrial-phase amphibians and mammals do not exceed EPA's LOC. Similarly, chronic RQs for mammals did not exceed EPA's LOC. Note that birds, for which chronic risk is not indicated, serve as surrogates for reptiles and amphibians when determining chronic risk (1) (7).

These risk determinations do not suggest need for specific procedures to protect these animals.

5. Water Supplies

There are no setbacks or use restrictions on the label for ProcellaCOR™ EC.

Note that Maine Statute requires written consent from the public water supplier prior to a discharge of a pesticide into a public water supply. This requirement applies also to proposed discharges into water bodies upstream of a public water supply, e.g., upstream impoundments on a river system which flow into a downstream public water supply.

6. Recreational Use of Water in Treatment Area:

There are no restrictions on recreational use on the label for ProcellaCOR™ EC.

7. Protection from Oxygen Loss/fish avoidance:

The ProcellaCOR™ EC label recognizes that herbicide treatment of aquatic plants can result in oxygen depletion from biological oxygen demand of dying plants. The label recommends treating water bodies with very high plant density in discrete sections to allow refugia for fish.

8. Persistence

Degradation of ProcellaCOR depends on environmental conditions but the overall profile for this chemical does not indicate a tendency to persist in the aquatic environment. It has shown short persistence in water and sediment relative to herbicides such as endothall, 2,4-D and triclopyr (5).

In aquatic settings, florpyrauxifen-benzyl degrades rapidly and mostly through photolysis (half-life of <1 day) and aerobic aquatic metabolism (half-life of 4-6 days). It shows low mobility in soils and readily binds to soil or sediment (1). Two outdoor dissipation studies injected the ProcellaCOR SC formulation into ponds at rates of 50 and 150 µg/l as the active ingredient. In one study, water phase dissipation half-lives were 3.0-4.9 days. In another study, a rice paddy with conditions similar to wetland habitat, water phase half-lives ranged from 0.15-0.79 days. These pond study results do not indicate a tendency for the material to persist in the aquatic environment (5).

Degradation of florpyrauxifen-benzyl results in three major products which degrade more slowly than the parent compound. The parent compound and the degradates are all considered stressors to aquatic plants. Only the parent compound is a stressor to aquatic animals. The degradates ultimately mineralize or bind to soil or sediment (7).

D. Human Health Considerations

The EPA considers a pesticide's exposure information (how and where it will be used), environmental fate studies, and toxicity studies (for humans and other non-target organisms) to determine the risk from exposures to the candidate product. The EPA evaluated all available toxicity data, including considering the sensitivities of major subgroups such as infants and children. No additional data are required at this time (1). Two studies were waived, the reasons for which are explained in EPA documents (8).

Florpyrauxifen-benzyl was granted in 2016 Reduced Risk status by EPA for both the food and aquatic uses based on promising environmental and toxicological profiles in comparison to registered alternatives used to treat invasive aquatic plants. The overall profile, i.e., considering risk to humans and the environment, appeared more favorable than currently registered alternatives. The reduction in risk to human health was the driving factor for the Reduced Risk determination (1, 5).

The EPA released a risk assessment in 2017 for the active ingredient florpyrauxifen-benzyl for food applications but also for registration for use in freshwater aquatic macrophyte control.

EPA reports that the active ingredient is not likely to be carcinogenic since there is no increase in tumor incidence in rat and mouse carcinogenicity studies. There is also no evidence of genotoxic potential. Based on review of available toxicological studies, no toxicity endpoints or points of departure for florpyrauxifen-benzyl were selected for risk assessment. Therefore, a safety factor to protect children is not needed (8).

EPA's Health Effects Division further determined that a quantitative risk assessment is not needed. A qualitative human health risk assessment was conducted. No risks of concern were identified because no adverse effects were observed in the toxicological studies submitted by the registrant (8).

The State of Washington's review of mammalian toxicity testing of ProcellaCOR™ EC conducted by the registrant states that data show little evidence of acute or chronic toxicity. Testing of ProcellaCOR™ EC for acute mammalian toxicity showed very low acute toxicity by oral or dermal routes, and acute toxicity is also reported low via inhalation. ProcellaCOR™ EC is not reported to be an eye or skin irritant and demonstrated only weak dermal sensitization (5).

Based on the laboratory testing on mammalian species, little to no acute or chronic toxicity for humans is expected from environmental exposure (5).

There are no restrictions on use of water treated with florpyrauxifen-benzyl for drinking water, swimming, fishing, other recreational uses (1).

E. Potential Negative Effects

1. Biomagnification/Bioconcentration

As described above (see Persistence), the active ingredient florpyrauxifen-benzyl tends not to persist in the environment. Fish bioaccumulation data showed low bioconcentration factors and rapid depuration, suggesting extensive metabolism of the active ingredient. Studies also demonstrate extensive metabolism of florpyrauxifen-benzyl, indicating bioaccumulation is unlikely. Florpyrauxifen-benzyl is also relatively short-lived in aquatic metabolism systems (2-6 days), further limiting potential for bioaccumulation (1).

2. Non-Target Plants

ProcellaCOR™ EC has few or limited impacts to native aquatic plants including grasses, bulrush, pondweeds, naiads and tapegrass (5). But the label for ProcellaCOR™ EC lists the native watershield (*Brasenia schreberi*), a common aquatic plant in Maine, as susceptible to the product. Also listed is *Nymphoides* spp; one plant in this genus, little floating heart (*Nymphoides cordata*) is also commonly found in Maine lakes (2). Although it appears that the list of susceptible native plants is short, it is important to plan any herbicide treatment program to carefully to limit impact to non-target species.

3. Non-target animals

ProcellaCOR™ EC has a favorable toxicological profile for non-target animals. It is practically non-toxic on an acute basis to birds, mammals and bees. Toxicity to fish and aquatic organisms was not observed, in most cases, at the highest levels tested. Chronic toxicity to birds and mammals was not observed but chronic tests with a midge (*Chironomus* sp.) and mysid (*Daphnia magna*) showed some toxicity at all levels tested (1).

Acute toxicity for Technical Grade Active Ingredient (TGAI) florpyrauxifen-benzyl using *D. magna* indicated LC₅₀ values (lethal concentration at which 50% of the test populations dies) of greater than 62µg/L, and greater than 60µg/L for *Chironomus* sp. Given typical treatment concentrations to kill invasive aquatic plants on the order of 50µg/L or less, the above results indicate little to no acute toxicity to these species. There's likely an even larger protective margin for these species since pure TGAI would not be expected to be introduced into the environment (5).

4. Low Dissolved Oxygen

Low dissolved oxygen conditions are a potential issue with any fast acting herbicide when treating large areas of dense plant growth. Due to concern for low dissolved oxygen levels from decomposition of dead aquatic plants, EPA required inclusion of an Environmental Hazard statement on the label (7). The label for ProcellaCOR™ EC states that treatment of aquatic macrophytes can result in oxygen depletion or loss which may cause fish suffocation. To prevent potential suffocation of fish, water bodies should be treated in sections. Related to the concern for oxygen depletion is a use restriction on the label requiring 14 days or greater between applications (2).

5. Nutrient Release

Nutrient release and possible alterations in pelagic productivity is also a potential negative effect of large scale plant die-off. Even with the timing restriction designed to reduce DO loss, there is potential for changes in pelagic algae growth and perhaps also periphyton in near shore areas, especially over the short term (1-2 seasons). Some of this may be mitigated by a re-bounce of native plant biomass.

Pre- and post- treatment monitoring will be designed to evaluate this effect, but unless the invasive plant populations are very dense, we do not expect wholesale water quality changes (nutrients, DO) to result in most cases.

6. Drift to non-target areas

a. In-lake Drift and Persistence

For foliar aquatic uses, spray drift may have detrimental effects if droplets reach non-target aquatic plants (7). The plants listed on the label for control with foliar application, however, are not likely the plants that DEP will seek to treat with this ProcellaCOR™ EC. Instead, DEP will most likely conduct in-water application with this product to control submersed aquatic weeds.

Drift of the product applied in-water may impact plants in adjacent areas but the treatment will be planned to manage the target plants without significantly impacting adjacent areas of native plants. In addition, the active ingredient applied in the water may degrade rather quickly (half-life of 4-6 days), further limiting impacts on plant communities adjacent to the treatment area. Finally, the favorable toxicological profile for ProcellaCOR™ EC suggests that drift to non-target areas will have limited impacts.

b. Groundwater

Florpyrauxifen-benzyl shows low mobility in soils and readily binds to soil and sediment (1).

ATTACHMENT B

(References)

References

General

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- 3) Massachusetts 2003. Eutrophication and Aquatic Plant Management in Massachusetts: Final Generic Environmental Impact Report
- 4) Maine DEP 2006, Rapid Response Plan for Invasive aquatic Plants, Fish and other Fauna Jan. 2006.
- 5) Personal Communications (IASP)
Dr. William Haller, University of FLA
Dr John Madsen, Mississippi State University
Dr. Kurt Getsinger, US Army Corps of Engineers, Waterways
Experiment Station, Vicksburg MS
Ms. Kathy Hamil, Washington State Dept. of Ecology
Shaun Hyde, SePRO Corporation
- 6) USUSEPA ECOtox and IRIS Database excerpts
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Florpyrauxifen-benzyl

- 1) USEPA 2017 Final Registration Decision on the New Active Ingredient Florpyrauxifen-benzyl
- 2) SePRO 2018 ProcellaCOR™ EC (USEPA# 67690-80) label
https://www.sepro.com/Documents/ProcellaCOR_EC--Label.pdf
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