

September 20, 2023

Ms. Breeka Lí Goodlander, Agent
Town of Franklin Conservation Commission
355 East Central Street
Franklin, MA 02038

**Re: Spruce Pond
MassDEP File No. 159-1267
Notice of Intent Peer Review Update**

Dear Ms. Goodlander:

BETA Group, Inc. (BETA) has reviewed documents and plans for the project entitled: ***Spruce Pond Aquatic Management Program*** located in Franklin, Massachusetts (the "Site"). This letter is provided to present BETA's findings, comments, and recommendations based on the most current Notice of Intent (NOI) submission.

BASIS OF REVIEW

The following additional documents were received by BETA and will form the basis of the review:

- ***RE: Spruce Pond Aquatic Management Program Peer Review (DEP File # 159-1267)***; prepared by SÖlitude Lake Management; dated August 15, 2023. Inclusive of:
 - Resource Area Impact Summary Form
 - Material Safety Data Sheets (MSDS); ***Sonar A.S. Aquatic Herbicide***; prepared by SePro; dated August 15, 2023.
 - ***Re: Franklin Wetland Bylaw Variance Request for the Selective Control of Invasive Purple Loosestrife (Lythrum salicaria) at Spruce Pond (DEP File # 159-1267)***; prepared by SÖlitude Lake Management; dated August 15, 2023.
- Product label sheets: ***Sonar A.S.***; prepared by SePro; dated February 8, 2022.

Review by BETA included the above items along with the following, as applicable:

- Site visit on April 25, 2023
- ***Massachusetts Wetlands Protection Act 310 CMR 10.00*** effective October 24, 2014
- ***Wetlands Protection Chapter 181 From the Code of the Town of Franklin***, dated August 20, 1997
- ***Conservation Commission Bylaws Chapter 271 From the Code of the Town of Franklin***, dated July 11, 2019
- ***Town of Franklin Conservation Commission Regulations***, dated October 3, 2019
- ***Town of Franklin Best Development Practices Guidebook***, dated September 2016
- ***Guidance for Aquatic Plant Management in Lakes and Ponds: As it Relates to the Wetlands Protection Act***, dated April 2004.
- ***Eutrophication and Aquatic Plant Management in Massachusetts: Final Generic Environmental Impact Report***, dated June 2004
- ***Practical Guide to Lake Management in Massachusetts***, dated 2004.

PEER REVIEW UPDATE – SEPTEMBER 20, 2023

The Applicant has provided revised materials and written comment responses pursuant to BETA's June 12, 2023, peer review letter. BETA's original comments from the May 4, 2023, peer review letter are included in plain text, and comments attributed to the undated SŌlitude Lake Management (SLM) letter submitted in June 2023 are provided in *italics* and prefaced with "*SLM:*". BETA's subsequent comment responses issued on June 12, 2023 are listed in bold and prefaced with "**BETA2:**". Comment responses attributed to SLM in their August 15, 2023 response letter are prefaced with "*SLM2:*". BETA's most recent responses are provided in bold and prefaced with "**BETA3:**".

At this time, the Applicant has provided the Conservation Commission with adequate information to describe the Site, the work, and the effect of the work on the interests identified in the Act and the Bylaw.

SITE AND PROJECT DESCRIPTION

Spruce Pond (the Site) is a 5.25-acre waterbody bisected by Quince Island Road in Franklin, Massachusetts. The northern portion of the Pond is 4.75 acres, and the southern portion is 0.50 acres. The Site is bounded to the north by King Street, to the south by a wetland complex, and to the east and west by multi-family residential properties. Spruce Pond is fed by stormwater runoff and a wetland complex to the south and flow is conveyed under Kings Street through a weir structure to another wetland complex to the north.

Resource Areas Subject to Protection under the Massachusetts Wetlands Protection Act (M.G.L. ch.131 s.40) and its implementing regulations at 310 CMR 10.00 (collectively "the Act"), as well as the Town of Franklin Wetlands Protection Bylaw (Chapter 181) and its associated regulations (collectively "the Bylaw") present at the Site include Land Under Water (LUW), Bordering Vegetated Wetlands (BVW), and inland Bank.

The Site is not located within any Wellhead Protections Areas (Zone I, Zone II, & Interim) or Surface Water Protection Areas (Zone A, B, or C). There are also no Outstanding Resource Waters (ORWs) or Areas of Critical Environmental Concern (ACEC) present, and the most recent Natural Heritage and Endangered Species Program (NHESP) mapping does not depict any Priority Habitat of Rare Species or Estimated Habitat of Rare Wildlife at the Site. There are no NHESP-mapped Certified or Potential Vernal Pools located within 100 feet of the Site. According to the FEMA Flood Insurance Rate Map (FIRM) community panel number 25021C0309E, dated July 17, 2012, the parcel is located within a Zone X floodplain.

The Applicant seeks approval for the treatment of invasive and nuisance species, particularly variable-leaved water milfoil (*Myriophyllum heterophyllum*), purple loosestrife (*Lythrum salicaria*), and filamentous algae species, using registered herbicides and algaecides (collectively referred to as the "Project"). A regular monitoring plan is additionally proposed to gauge treatment effectiveness. Specific herbicides and algaecides are proposed as follows:

- The application of three (3) herbicides, diquat (Tribune), glyphosate (Aqua Pro for use in Spruce Pond and Rodeo for use along its banks), and Fluridone (Sonar); and
- The application of three (3) copper based algaecides (Captain, SeClear, and GreenClean PRO).

The Project will result in temporary impacts within the LUW Subject to Protection under the Act and the Bylaw.

ADMINISTRATIVE AND PLAN COMMENTS

PLAN AND GENERAL COMMENTS

- A1. MassDEP has issued DEP File No. 159-1267 for the Site and provided the following technical comment “Higher value wildlife habitat is achieved when there is less than 100% open water surface and at least 30% coverage of native aquatic plant species. MassDEP recommends that treatment be limited to areas where invasive non-native species are dominant.”

SLM: We will strive to meet the goal of 30% coverage of native aquatic plant species. A healthy pond needs to have some plants. We never want to remove everything.

For the other 70%, our goal is to eliminate the invasive species and the aggressive nuisance species in order to allow native species to return.

BETA2: Further discussion relating to MassDEP’s comment is provided in Comment W6.

*SLM2: Aquatic vegetation management generally focuses on maintaining a balanced native plant assemblage in order to establish and maintain optimal habitat conditions. In shallow, altered and/or constructed systems like Spruce Pond that are prone to supporting widespread macrophyte and algae growth this often requires judicious management of native species. As is the general rule for warm-water systems the goal of this program is to manage/eradicate invasive variable watermilfoil (*Myriophyllum heterophyllum*) and maintain a 20%-40% cover of native vegetation growth. As such, the attached map depicts priority management areas along with areas where no native plant management will be conducted. This should provide ample area for the propagation and proliferation of native species. Annual surveys and specific growth conditions within the priority management zones will dictate the strategy and extent of management in any given year.*

BETA3: Based on recommendations provided by MassDEP, the Applicant should aim to meet at least a 30% coverage of native aquatic plant species rather than the 20%-40% referenced above. The Commission could condition the Project to require that a 30% coverage of native species is achieved, if feasible, in an Order of Conditions.

- A2. BETA defers to the Commission on the plan requirements presented in Section 7.18 of the Bylaw and if a variance should be requested.

SLM: Section 7.18 says submitted plans must include several things, including details on existing vegetation, detailed maps and more.

Our original application included basic maps such as a site locus and proposed treatment area.

We conducted the requested species survey. And are sharing an additional map and descriptions on what we found. Based on that. Our treatment will be reduced to avoid the areas shown in the black dotted areas shown in figure 1.

OUR SURVEY FOUND THE FOLLOWING SPECIES IN THE POND AREA AND ADJACENT BANKS. The map below (Figure 1) shows locations¹.

Avoiding specific areas.

¹ Note: Figure 1 can be viewed in the provided comment response letter from Sōlitude Lake Management.

The black dotted lines show the areas we will avoid when we conduct treatment. We will not treat along King Street, and we will not treat where the pond starts to become a swampy area, to the west.

BETA2: See BETA2 response to Comment W6.

SLM2: We feel that the plan/maps and supporting information that we have provided as part of the initial filing and subsequent submissions are adequate to allow the Commission and staff to accurately review the project and the potential impacts. The plan details are commensurate with other projects across the state.

BETA3: Comment addressed. See BETA3 response to Comment W6.

- A3. The WPA Form 3 notes 228,690 sf of impacts to LUW, but the Resource Area Impact Summary Form notes 1,306,800 sf of impacts. The Applicant should clarify which impact number is accurate.

SLM: 228,90 is accurate.

BETA2: BETA assumes 228,690 sf is the accurate total area of LUW impact as shown on the WPA Form 3. It is recommended that the Applicant revise the Bylaw Resource Area Impact Summary Report Table.

SLM2: See Figure 1 (A1). Although the routine management zone has been reduced to 141,570 SF, we have left the area of disturbance at 228,690 SF as management of invasive milfoil may occur in the habitat preservation zone. A revised Resource Area Impact Summary Report Table is attached.

BETA3: Comment addressed. A revised Resource Area Impact Summary Form has been provided.

- A4. The Notice of Intent provides general information regarding the use of the proposed chemicals but does not provide information such as anticipated Site access, staging areas, application rates, or other information specific to this Site. The Applicant should describe any staging areas and anticipated Site access and show these areas on the Project plans².

SLM: We will launch from a parking area where Quince Island Road comes neat the water (Figure 2³) We will place a jon boat in the water there and carry all treatment chemicals to the boat. No damage to the shore or bank should occur. We have launched there previously with no damage or complications.

BETA2: The Applicant has clarified how they will access the Site; however, the remainder of this comment remains unaddressed. The Applicant should disclose any staging that is required and determine the volume of herbicides to be used based on the provided application rates and areas to be treated.

SLM2: The table below outlines the requested aquatic products. There will be no staging of equipment and/or products in order to facilitate active management of target growth. All materials will be transported via pick-up truck, deployed, and retrieved on the day work is to occur.

² Refer Section IV Part C of *Guidance for Aquatic Plant Management in Lakes and Ponds: As it Relates to the Wetlands Protection Act* for additional information describing the work that should be provided.

³ Note: Figure 2 can be viewed in the provided comment response letter from SŌlitude Lake Management.

BETA3: Comment addressed. Anticipated application rates for each herbicide and algaecide proposed for treatment have been provided and appear to be consistent with the recommended rates as listed in the associated product label.

- A5. Beyond the statement that application of the proposed chemicals will be completed by Certified Applicators, information typically presented in the Material Safety Data Sheet(MSDS) regarding the safe use and handling of the proposed chemicals has not been provided. The MSDS or equivalent should be provided for each of the chemicals discussed in the NOI for use at the Site.

SLM: I have gathered these MSDS sheets. We are emailing the sheets to the conservation commission along with this file.

MSDS sheets usually refer to a concentrated chemical product and these sheets usually are meant as a reference sheet for those who may come in contact with the concentrated product as it is being shipped or stored.

*The product is diluted when applied in the field. For use in the field, a better safety measure is the **product label**. These labels can be multiple pages in length and set rules for how the chemical is carried in the field, how it is applied, safety measures and more.*

I've also included the product labels in separate files.

Per a question about glyphosate that came up during the last meeting – AquaPro is a glyphosate product that is formulated for use in water. It is registered with the EPA for this use.

BETA2: All MSDS and product labels have been provided with the exception of Fluridone (Sonar). Provide the additional MSDS and product label.

SLM2: The Sonar AS (liquid) SDS and EPA label are attached.

BETA3: Comment addressed.

- A6. The Applicant should provide a narrative discussing factors contributing to the development of nuisance aquatic vegetation at the Site, as well as additional factors that should be considered for long-term management (i.e. nutrient control), instead of repeated use of short term management methods⁴.

SLM: The typed of aquatic vegetation found in Spruce Pond is typical for many ponds in Massachusetts. The invasive plants such as milfoil can arrive in many ways, including washing in from other waterbodies, or by clinging to waterfowl or boats. It can be very challenging to keep these plants from entering a water body. But they can be controlled once they are there.

Algae tends to form when a waterbody has high phosphorous levels, often created by rotting vegetation, fertilizer runoff, and animal waste, including aquatic animals.

Limiting nutrients that enter a waterway is a viable way to reduce phosphorous, and in turn plant and algae growth is. The long-term efficacy of nutrient management strategies is determined by the origin of the nutrient load to the system (internal vs. external).

⁴ Section IV Part A of *Guidance for Aquatic Plant Management in Lakes and Ponds: As it Relates to the Wetlands Protection Act*

The condo association should be encouraged to continue limiting the amount of fertilizer used in the area. Pet owners should be encouraged to pick up animal waste.

But a nutrient load can come from multiple external sources within the larger town watershed. Full control of run-off likely needs to be part of a larger set of watershed rule for the town.

BETA2: The Applicant should clarify current fertilizer types and application rates implemented by the Spruce Pond Village Association. Other Best Management Practices (BMPs) such as public pet waste disposal bins that exist onsite, or have the potential to be installed, should be discussed as documentation of pollution prevention practices that are currently in place. While it is understood that offsite activities within the greater watershed can impact water quality, onsite nutrient loading should be minimized concurrently with the use of chemical treatments to increase efficacy and decrease the frequency of future treatments. Comment remains.

SLM2: We agree that BMPs should be a part of the Spruce Pond Village Association's overall property and pond management program. Given that it will take some time to identify current fertilization and pet waste disposal practices at a minimum, we ask that the Commission condition this project requiring the development of a staff/Commission approved BMP plan within a timeframe specified.

BETA3: BETA defers to the Commission for approval of the Applicants request and inclusion of their recommended condition in the Order of Conditions.

- A7. Monitoring of the Site before, during, and after chemical application should also include monitoring of water quality such as temperature and pH to provide a comparative benchmark. The Application should provide a more robust monitoring plan that is inclusive of water quality testing in additional to visual observations⁵.

SLM: We agree to test for PH, temperature and O2 and visibility. Are their specific tests the town would like to request?

BETA2: The Applicant has not prepared a formal monitoring plan/protocol. This document should include methods for testing pH, temperature, dissolved oxygen concentrations, turbidity, and aquatic vegetation regrowth, as well as include the frequency of pre- and post-treatment testing. The document should also include methods for collecting, compiling, and reporting the gathered data. Comment remains.

SLM2: During the course of the growing season the pond will be visited on a monthly basis and inspected to determine the aquatic plant and algae growth conditions. These routine inspections consist of aquatic plant identification, species mapping using WAAS enabled hand-held GPS. Identified plant species will also be assigned a basic percent cover and biomass index value. These indices are outlined below.

Percent Cover

- 1%-25% of the bottom covered by vegetation
- 26%-50% of the bottom covered by vegetation
- 51%-75% of the bottom covered by vegetation

⁵ Section 4.6.6.3 of *Eutrophication and Aquatic Plant Management in Massachusetts: Final Generic Environmental Impact Report*.

- 76%-100% of the bottom covered by vegetation

Biomass Index (1-4)

- 1 - subject macrophyte growth is present only in the first 25% of the water column
- 2 - subject vegetation growth is present in the first 50% of the water column
- 3 - subject vegetation growth is present in the first 75% of the water column
- 4 - subject vegetation is growing throughout the entire water column to the surface

In addition filamentous algae mats (surface & benthic) will be mapped. Secchi disk transparency readings will also be conducted. This vegetation information will be recorded monthly during the growing season (April-September) and will be the basis for determining if active vegetation and/or algae management is required. In the event that treatment is necessary the following additional water quality monitoring will be conducted at two in-pond locations.

Pre-Treatment

Immediately prior to conducting a scheduled treatment, a temperature and dissolved oxygen profile will be recorded using a YSI Pro20 in situ meter. Measurements will be collected at 1ft. intervals, including surface and bottom, throughout the water column.

pH and turbidity profiles will also be collected using an In Situ multi-meter.

Post-Treatment

Two weeks following a conducted treatment the pre-treatment water column and vegetation monitoring will be replicated.

Any sampling anomalies or observed detrimental impacts will be reported to the Commission immediately. All other survey and monitoring data will be reported to the Commission in a Year-End Report that will summarize the management work conducted and all vegetation and water quality data.

BETA3: Comment addressed.

- A8. "Figure 2: Vegetation Assemblage" appears to depict treatment within the Kings Street Right of Way. The Applicant should provide documentation showing the Town's approval for work on their property.

SLM: We have dropped this treatment area from our request. The black dotted outline in Figure 1 shows the area that we will avoid.

Note: Figure 1 can be viewed in the provided comment response letter from SŌlitude Lake Management.

BETA2: Comment resolved.

Additional SLM comments:

This Project is adjacent to Bordering Vegetated Wetlands (BVW) and inland Bank but no discussion of these Resource Areas at the Site or how the work may or may not impact these Resource Areas has been provided.

SLM: We do not plan to enter the BVW area. The inland bank area is addressed in our answers in section W3 below.

BETA2: No further comment required.

Methods of chemical application

Methods of chemical application specific to Site have not been discussed, and detailed information for the proposed chemicals such as Material Safety Data Sheets have not been provided. Therefore, additional information is required to describe the work and the effects of the work on the interests of the Act and the Bylaw.

SLM: Tribune:

During the application, approximately 62% of the pond (5.25 acres) will be treated with Tribune. A Jon boat will be utilized for the treatment, outfitted with onboard containment -where the diquat herbicide will be diluted with lake water before application (as per the requirements of the product label). A calibrated pump system will be used to apply the chemical mixture subsurface through a weighted hose system while the vessel is guided by GPS to ensure even application throughout the treatment areas.

Glyphosate:

Stands of purple loosestrife within the designated treatment area of the pond will be treated with AquaPro (Glyphosate). The herbicide will be diluted with pond water and applied directly to the foliage of the plant via a low-pressure backpack sprayer or hand-wicker from a small jon boat and by walking around the perimeter of the ponds.

Copper-based algaecides

There areas where filamentous algae is present will be targeted with copper-based algaecides. We most often use Captain XTR, SeClear, and GreenClean PRO. These also will be distributed from a jon boat using a pump system, over the areas where algae is found.

We will provide data sheets for all chem.

BETA2: See BETA2 response to Comment A5.

BETA3: Comment Addressed. See BETA3 response to Comment A5.

WETLAND RESOURCE AREAS AND REGULATORY REVIEW

BETA conducted an onsite and completed a regulatory review of the submitted document, focusing on compliance with Resource Area definitions and Performance Standards set forth in the Act and the Bylaw. The Project is proposed within Land Under Water and as such is subject to specific Performance Standards under the Act. Additionally, the Project is adjacent to Bordering Vegetated Wetlands (BVW) and inland Bank but no discussion of these Resource Areas at the Site or how the work may or may not impact these Resource Areas has been provided.

The NOI application includes narrative information describing the Project, and the proposed impacts associated with the chemical treatments have been generally described. Methods of chemical application specific to Site have not been discussed, and detailed information for the proposed chemicals such as Material Safety Data Sheets have not been provided. Therefore, additional information is required to describe the work and the effects of the work on the interests of the Act and the Bylaw.

RESOURCE AREA AND BOUNDARY COMMENTS

BETA conducted a Site visit on April 26, 2023 to assess existing conditions at the Site with specific focus on proposed management areas.

- W1. BETA observed water lilies at the northern extent of Spruce Pond along Kings Street as mapped on the Site plan; however, the time of year is not appropriate to provide comment on the extent of the nuisance vegetation described in the NOI.

SLM2: The aquatic management program proposed for Spruce Pond is a maintenance level program, so nuisance level growth conditions may not always develop. As indicated in our response to A1 & A7, active management will only be conducted when routine survey data indicates an exceedance of the criteria outlined for each management zone.

BETA3: Comment addressed.

- W2. Although work is proposed to generally occur within Spruce Pond, the surrounding Resource Areas including BVW and inland Bank were not identified or specifically discussed. BETA defers to the Commission on whether they will require the identification of these Resource Areas through field delineation, or if they will accept approximation through orthoimagery⁶.

SLM: We will not enter any adjacent wetlands. All work will take place in the area we outlined in our map and description. The only part of the bank we will interact with is where (and if) some purple loosestrife may grow on the bank.

BETA2: BETA defers to the Commission regarding the identification and delineation of onsite Resource Areas.

SLM2: We do not feel that resource area delineation is necessary, given that work and/or activity within Bank and BVW will consist primarily of ingress and egress to the pond.

BETA3: BETA defers to the Commission regarding the identification and delineation of onsite Resource Areas.

MITIGATION COMMENTS

- W3. The NOI requests the use of an algaecide should nuisance algae conditions develop in the pond but provides no analysis supporting that use of algaecide is preferred over other methods of algae control. As suggested in *Guidance for Aquatic Plant Management in Lakes and Ponds: As it Relates to the Wetlands Protection Act* "Control of nutrients is used to achieve control of algae and associated water quality problems (e.g., oxygen depletion, taste and odor), but as algae tend to be the symptom and nutrients constitute the real problem, the focus is on nutrient control". The Alternatives Analysis within the NOI should be revised to discuss alternatives to the use of algaecide including nutrient control methods⁷.

SLM: We would like to add the following text to the Alternatives Analysis Unbalanced growth of cyanobacteria or other algae species is in some way a function of an abundance of available nutrients. In freshwater systems the limiting nutrient necessary for plant and algae growth is phosphorus. Therefore managing/reducing phosphorus availability can indirectly limit the production of algae. The long-term efficacy of nutrient management strategies is determined by the origin of the nutrient load to the system (internal vs. external). If the majority of the nutrient

⁶As suggested in Section IV Part B of *Guidance for Aquatic Plant Management in Lakes and Ponds: As it Relates to the Wetlands Protection Act*

⁷ Methods as presented in Section 3.1 through 3.7 of *Eutrophication and Aquatic Plant Management in Massachusetts: Final Generic Environmental Impact Report* and discussed in greater detail in the *Practical Guide to Lake Management in Massachusetts*.

load is coming from external sources (watershed), control of the nutrient load is out of the hands of the Spruce Pond Village Association. Control likely needs to be part of a larger set of watershed rules for the town. Also, the benefits of in-lake nutrient management strategies are generally more short-lived. Under these circumstances more frequent lower-dose treatments with phosphorus binding compounds provide better prevention of elevated phosphorus conditions. As a result, additional investigation or nutrient budgeting should be performed in order to fully be able to evaluate long-term efficacy of efforts to limit nutrient loads.

BETA2: The Applicant should perform, at a minimum, a cursory investigation regarding nutrient loading at the Site as discussed in the BETA2 response to Comment A6.

SLM2: Although nutrient mitigation strategies may lessen algae production in the system, it will likely result in more frequent treatment and do very little to impact problematic rooted plant growth. With that said we are agreeable to some baseline sampling to investigate nutrient loading in the Spruce Pond.

We recommend three rounds (spring, summer, fall) of baseflow sampling and one stormflow sampling event. The baseflow samples will be collected from four locations (inlet, mid-pond, mid-pond deep, and outlet). The stormflow samples will be taken from primary tributaries to the pond during the first flush of storm event.

Like the BMP plan, however, we feel that if this is something that Commission wants the project can be conditioned to require the development of a suitable sampling plan and execution timetable.

BETA3: Comment addressed. BETA concurs with the recommended baseflow sampling and defers to the Commission for inclusion of this sampling as a condition of Project approval.

- W4. The Commission could consider requiring advanced notification for algaecide applications, with a requirement that the Applicant demonstrate establishment of algae onsite.

SLM: We always do pond surveys before planning treatment, and we always provide advanced notification. If we see algae, we can send photos to the town and highlight our treatment plans.

BETA2: Comment resolved.

- W5. The Applicant should provide a detailed alternative analysis for the proposed chemicals, outlining why certain herbicides and algaecides were selected, and which will be used in certain conditions.

SLM:

Alternatives Analysis

Alternatives to the proposed Aquatic Plant Management Plan were considered. SOLitude evaluated all available strategies for management of Spruce Pond. Findings and recommendations are based on direct experience and discussions found in the "Eutrophication and Aquatic Plant Management" in Massachusetts GEIR, EOE 2004

Bottom Weed Barriers: Not Recommended

Physical controls, such as the use of bottom weed barriers (i.e. Aquatic Weed Net or Palco) can be effective for small dense patches of nuisance vegetation, but are not cost effective or feasible for large areas. Weed barriers are expensive to install and maintain at ~\$1.75/ft² (material & installation). Semi-annual maintenance to retrieve, clean and re-deploy the barriers would be expensive and time consuming. Additionally, covering expansive areas of the pond bottom may

also have detrimental impacts on invertebrates or other types of wildlife.

Harvesting: Not Recommended

Harvesting of variable watermilfoil is not recommended because its ability to reproduce through vegetative fragmentation, leading to increased spread into previously un-infested areas or further intensifying growth rates. Additionally, harvesting would be costly and at best would only provide a season of relief from the native vegetation growth with no guarantee of success. The disruption and non target impacts would be more significant than with spot-treatments using aquatic herbicides.

Biological: Not Recommended

There are no proven biological controls available or approved by the State for the control of the invasive aquatic plant species present at McCain Pond.

Sediment Excavation/Dredging: Not Recommended

Dredging nutrient rich bottom sediment is sometimes used as a strategy to control excessive weed growth. Conventional (dry) or hydraulic dredging would require the expenditure of hundreds of thousands of dollars in design and permitting fees alone. Dredging may also have severe impacts to aquatic organisms (i.e. fish and macroinvertebrates) in the ponds with no guarantees of elimination of invasive vegetation.

Hydro Raking: Not Recommended

Hydro raking of weeds is not recommended for these types of weeds. It would not be a long-term solution. It would also be extremely challenging because of the location of McCain pond (in a wooded area) and because of the size of the infestation. Hydro raking would not be feasible or cost effective for this size area.

Do Nothing: Not Recommended

If the invasive and nuisance plant and algae growth is allowed to continue unabated, eutrophication and filling-in at the pond will continue to occur at an accelerated rate due to the annual decomposition of excessive plant material. Anoxic conditions would degrade water quality and potentially impact fish and other aquatic organisms. Stagnant conditions will also increase water temperatures promoting both algae and bacterial growth as well as providing extensive mosquito breeding habitat. The pond's recreational and aesthetic value would be significantly degraded.

BETA2: The Applicant has provided an Alternatives Analysis for different treatment methods; however, the Applicant has not assessed alternatives as they relate to the selected chemicals. Comment remains.

SLM2: Some related information is provided in the table included in the response for A4. Given that this program is intended to maintain desirable conditions, the suite of products selected was based on the combined ability to address the variety of potential management conditions that may be encountered over the course of the program.

Diquat - *Diquat is a fast acting contact herbicide that is particularly effective on variable milfoil and a variety of other species. Its fast absorption by target plants following application makes it effective for smaller partial pond area selective management.*

Diquat can also be used in conjunction with copper-based algaecides to address difficult to control filamentous algae species (Pithophora, etc.). Diquat improves penetration through the mucilaginous sheath formed by many filamentous algae species.

Glyphosate - *Glyphosate is a systemic foliar active herbicide that is used to control emergent and floating-leaf plant species. This was selected to address nuisance waterlily growth and invasive purple loosestrife. There is no other aquatic labeled foliar product on the market.*

Fluridone - *Fluridone is a slow acting systemic herbicide that can be effective at controlling a wide array of nuisance plant growth. Its ultra low dose characteristics enable species selectivity by targeting narrow dose ranges. It can be effective in both area selective partial treatment scenarios and large scale treatments.*

Copper - *Copper is the primary active ingredient in most algaecides available in aquatics. This has a long track record of use and is very effective on a wide range of algae species.*

Peroxide - *Peroxide based algaecides are most effective on cyanobacteria (blue-green) algae. Although these products have limited effectiveness, they provide a greener and less impactful means to control cyanos. Given that oxygen is a breakdown product of peroxide there are less concerns about depleting dissolved oxygen with this product and the oxidative nature of the mode of action eliminates cyanobacteria toxins, if present.*

BETA3: The Applicant has provided supporting information for the chosen chemical treatments. BETA defers to the Commission to determine if the information provided by the Applicant is sufficient to support the prescriptive use of herbicides and algaecides as identified in the submitted Project documents.

- W6. A more detailed vegetation assessment than that provided on “Figure 2: Vegetation Assemblage” should be provided for the pond, noting areas of specific native and invasive aquatic vegetation, with the relative abundance. As an Ecological Restoration Limited Project, native aquatic vegetation should be preserved to the extent practicable, and the Applicant should demonstrate how they plan to preserve native vegetation.

SLM: We conducted a detailed survey in mid-June and shared our map of the vegetation (figure1) on page 2 of this document. As detailed in our answer to A1, our goal is to eliminate the invasive and aggressive nuisance species in order to allow native species to return. This replacement growth can sometimes take a few months.

BETA2: The Applicant should revise the figure to define areas of native vegetation and note that treatment will not be permitted within these areas to support the presence and continued propagation of native species. Further, the pond to the south is depicted as being included within the management area (PDF Page 100 of the revised NOI); however, it does not appear that data on existing vegetation was collected here. The Applicant should also clarify the limits of work and provide additional vegetation survey data as appropriate.

SLM2: We believe that this comment is addressed in our response to A1. Current vegetation data can be routinely provided to the Commission as a result of the monthly vegetation monitoring.

BETA3: Comment addressed. The Spruce Pond Aquatic Vegetation Management Zone provided as Figure 1 notes three Management Zone which includes a Habitat Preservation Zone. Although treatment of invasive milfoil is proposed in this Zone using Diquat (Tribune) to promote propagation of native species, no management of native species is proposed in this Zone. BETA concurs that regular vegetation monitoring should occur to inform the level of treatment in each Management Zone. BETA recommends the Commission be provided with monthly survey data as discussed above.

WPA PERFORMANCE STANDARDS COMMENTS

- W7. The Project is an Ecological Restoration Limited Project proposed within LUW of Spruce Pond. The Applicant has provided *Appendix A: Ecological Restoration Limited Project Checklists* as part of the NOI submission as instructed on the WPA Form 3.
- W8. The discussion of how the proposed Project will protect the interests of the Act should include more detailed information relating the protection of fisheries, such as spawning periods of species present at the Site to avoid potential fish kills⁸.

SLM: We do hundreds of applications in MA and we always follow the dosing on the label. When this is followed there is minimal danger.

The following spawning seasons for in-water animals is noted as follows:

Turtles: *Late April or early May. But there can be occasions when a lone female will decide to lay eggs at other times of the year.*

SmallMouth Bass: *Mid May though late June. This also applied to most other species of fish found in New England ponds.*

Bullfrogs: *Main spawning season is April. Some frogs may spawn into the summer, through August.*

Geese: *Mostly mid April to Mid may.*

*Most other **New England Birds** will lay eggs from late March to late may. Second or third broods may happen, for some species, into August.*

BETA2: **Based on the above date ranges, treatment in late summer will avoid impacting the typical aquatic species identified by the applicant. Comment addressed.**

SLM2: Although this is true, treatment late in the growing season is not always desirable as it has the potential to result in greater stress on the ecosystem. Plants that have been allowed to grow to full maturity do not actively put energy into new vegetative growth. As a result they do not readily uptake herbicides and often require higher doses to achieve effective control. Increased treatment doses further limits area and species selectivity. In addition, the added biomass of target plants in late season increases the risk of oxygen depletion resulting from plant decomposition following treatment. It is better to treat earlier in plant development when less biomass is present and water temperatures are cooler with higher concentrations of dissolved oxygen.

BETA3: **Comment addressed. As indicated by the Applicant, treatment early in the growing season can have the greatest impact on the target species⁹. Although this timing often correlates with the spawning periods for various aquatic species and waterfowl, prior studies on the impacts of the proposed herbicides and algaecides to these non-target species indicates that when applied at the recommended rates and using appropriate methods, impacts to the non-target aquatic species and waterfowl were not observed, or were observed to be minimal**

⁸ Per Section IV Part E of *Guidance for Aquatic Plant Management in Lakes and Ponds: As it Relates to the Wetlands Protection Act*.

⁹ Section 4.6.6. of *Eutrophication and Aquatic Plant Management in Massachusetts: Final Generic Environmental Impact Report*.

and/or short-term with an overall long term benefit provided by the treatments ¹⁰. The Applicant has provided more detailed information indicating that a lower dosage of herbicide can be used when performing treatments earlier in the season.

Should treatment be expected to occur early in the growing season, it should occur only when weather conditions are appropriate (i.e dry weather and calm winds) and application rates should remain consistent with the recommended rates for the product.

BYLAW REGULATORY COMMENTS

W9. The interests of the Act are generally discussed within the NOI, but this information is not specific enough to demonstrate that the proposed project will not negatively impact the functions and characteristics on onsite Resource Areas. A Function and Characteristics statement should be provided per Section 7.10 of the Bylaw that is specific to the Site.

SLM: This section states: It is the applicant's burden of proof to demonstrate that their proposed project/activity will not result in any significant individual or cumulative adverse effect to the functions and characteristics of resource areas, and the functions and characteristics statement is the applicant's opportunity to do so.

We believe the project will not have any adverse effects on the resource area. All chemicals we use are rigorously tested under supervision of federal and state governments. They are labelled as appropriate and safe for use in lakes, ponds, and other aquatic sites. We always apply them in a manner consistent with their labelling.

All pesticide applications made directly to the water or along the shoreline for the control of algae, aquatic weeds, or other aquatic pests will meet or exceed all of the Company's legal regulatory requirements as set forth by the EPA and related state agencies for National Pollutant Discharge Elimination System (NPDES) and Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) We perform treatments that are consistent with their compliance standards. All staff are fully trained to perform applications in compliance with all federal, state, and local law.

BETA2: The Applicant has not included the information required under Section 7.10 of the Bylaw. Comment remains.

SLM2: Section 6.0 of the original NOI addresses much of the requirements of section 7.10 of the Bylaw. Excerpts from the GEIR Practical Guide related to the interests of the Wetlands Protection Act are also provided within the descriptions of each herbicide and algaecide. In most all cases we believe that the judicious management of aquatic vegetation to provide a balanced aquatic ecosystem, is a net benefit to these specific interests.

Protection of public and private water supply – *Spruce Pond is not used directly as a drinking water supply. Aquatic herbicide treatment at the pond will not have any adverse impacts on the public or private water supply when used in accordance with the product label and conditions of the MA DEP License to Apply Chemicals.*

Protection of groundwater supply – *According to available studies, there is no reason to believe that the groundwater supply will be adversely impacted by the proposed management strategies,*

¹⁰ Section 4.6.6. of *Eutrophication and Aquatic Plant Management in Massachusetts: Final Generic Environmental Impact Report*.

specifically the application of the chemicals at the proposed rates to Spruce Pond, when used in accordance with the product labels. Contamination of groundwater by aquatic herbicides is limited by their low rate of application, rapid rate of degradation for the chemicals, and uptake by target plants. SŌLitude's State licensed applicators take all necessary precautions when mixing and disposing of all chemical containers.

Flood Control and Storm Damage Prevention – *No construction, dredging or alterations of the existing floodplain and storm damage prevention characteristics of the pond are proposed. However, in some instances, abundant and excessive aquatic plant growth can contribute to high water and flooding. Most commonly this occurs in the vicinity of waterbody outlets or water conveyance channels and structures. The unmanaged, annual growth and decomposition of abundant plant growth is also known to increase sediment deposition at an accelerated rate. Therefore, the proposed management approaches may increase the capacity of the resource area over the long-term to provide flood protection.*

Erosion & Sedimentation - *No construction or earthmoving tasks are proposed as part of this project. The maintenance level management of aquatic vegetation that is proposed will not result in any erosion or sedimentation of the resource area.*

Water Quality & Prevention of Pollution – *No degradation of water quality or increased pollution is expected by the proposed management approaches. The proposed herbicides are relatively slow-acting in controlling the nuisance vegetation. This results in a slow release of nutrients from the decaying plants, reducing the potential for increases in nutrients that can cause algae blooms. Removal of the excessive growth of aquatic vegetation will contribute to improved water circulation and a reduction in the potential for anoxic conditions. The post-treatment decrease in plant biomass will help to decrease the rate of eutrophication currently caused by the decomposing of excessive plant material.*

Protection of Fisheries and Shellfisheries – *Contiguous, dense beds of aquatic vegetation provide poor habitat for most species of fish. Dense plant cover frequently results in significant diurnal fluctuations in dissolved oxygen as well as oxygen depletion during certain times of the year. While temporary effects on some desirable submersed and floating-leafed species may occur following the application of an aquatic herbicide, non-target plants typically rebound quickly. Shoreline emergent plants will not be impacted following the use of aquatic herbicides.*

Protection of Wildlife and Wildlife Habitat – *In general, excessive and abundant plant growth, especially non-native plants, provides poor wildlife habitat for fish and other wildlife. The proposed management plan is expected to help prevent further degradation of the waterbody through excessive weed growth and improve the wildlife habitat value of the pond in the long-term. Maintaining a balance of open water and vegetated areas is intended.*

Agriculture – *The proposed aquatic vegetation management program will not preclude the site or downstream from being used for agricultural purposes.*

Aquaculture – *Neither the pond or downstream waters are used for aquaculture. However, both diquat and GreanClean products are routinely used in aquaculture operations to maintain desirable water quality conditions and prevent disease among the fish.*

Recreation – *In general, excessive and abundant plant growth are not conducive to water recreation. Boating and swimming can be difficult and potentially dangerous under dense growth conditions. Management of cyanobacteria that can produce toxins reduce the risk to water users.*

BETA3: Comment addressed. A Functions and Characteristics Statement pursuant to Section 7.10 of the Bylaw Regulations has been provided.

- W10. A sequence and schedule of the proposed chemical application should be provided pursuant to Section 7.15 of the Bylaw that is inclusive of the time of year, methods of application (i.e. via boat or on land), and application rate.

SLM: See Methods of chemical application section above. Final schedule cannot be set until the project is approved. We would like to treat by early to mid July. All three treatments can be delivered on the same day.

BETA2: As noted in the BETA2 response to Comment A4, more detailed information on the application rates (i.e., anticipated total volume of each herbicide required based on the relevant treatment areas) should be provided. Comment remains.

SLM2: See herbicide/algae table provided in response to A4.

BETA3: Comment addressed.

- W11. The Bylaw Regulations state that no work is permitted within 25 feet of a Resource Area. A portion of the Project includes management of purple loosestrife populations within the Bylaw 25-foot buffer zone. The Applicant must submit a Variance Request that meets the provisions of Section 5 of the Bylaw Regulations.

SLM We will remove our request for treatment along King street. This was originally proposed in order to treat reed plants that were growing and blocking the outlet of the pond. This is less of an issue now, and we don't need to treat this area.

BETA2: As noted above, the Applicant is required to submit a formal Variance Request for work within LUW, Bank, and the 25-foot Buffer Zone per Section 5 of the Bylaw Regulations. Comment remains.

SLM2: A formal Variance Request for the selective control of purple loosestrife is attached for the Commission's review and consideration.

BETA3: Comment addressed. A Variance Request has been provided with an alternatives analysis as required under Section 7.13 of the Bylaw Regulations. BETA defers to the Commission for approval of this Variance.

Ms. Breeka Lí Goodlander, Agent

September 20, 2023

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REVIEW SUMMARY

Based on our review of the NOI submittal and Project plans, the Applicant has provided sufficient information to describe the Site, the work, and the effect of the work on the interests identified in the Act and the Bylaw.

If we can be of any further assistance regarding this matter, please contact us at our office.

Very truly yours,

BETA Group, Inc.



Elyse Tripp
Staff Scientist



Jonathan Niro
Project Scientist

cc: Amy Love, Town Planner

Bryan Taberner, AICP, Director of Planning & Community Development

Matt Crowley, P.E., BETA