Restorative ⚗
Lake Sciences

Professional Aquatic Consulting Services Contract
For Magician Lake, Cass and Van Buren Counties, Michigan
January 1, 2018-December 31, 2018 (Renewable Annually)

The Magician Lake Improvement Association Board, hereinafter called the Association Board, Silver Creek Township Board, hereinafter called the Township Board, and Restorative Lake Sciences, LLC, hereinafter called the "Consultant" agree to this contract made on this ⟨9⟩ day of ⟨November⟩ , 2017.

Part I – Professional Lake Management Consulting Components:

The following items will be included in the professional consulting services:

1. Have a Restorative Lake Sciences, LLC scientist in attendance at Magician Lake Improvement Association Board meetings that are conducted for purposes of improvements to Magician Lake (i.e. the SAD procedures, or other technical and/or scientific issues) or upon request to present critical information to the Boards. The program will be discussed with Silver Creek and Keeler Townships before implementation.
2. Preparation of required contractor documents, analysis of documents, and recommendations to the Boards. If in the future, other lake management techniques are necessitated (i.e., weevils), then also the preparation, dissemination, and analysis of associated bid documentation, and recommendations of contractor selection to the Boards.
3. Technical assistance and dissemination of scientific information to the Boards regarding the ecological status of Magician Lake or other factors (external or internal) that may affect the balance of the Magician Lake aquatic ecosystem.
4. Oversight and management of the lake, including GPS and AVAS grid point aquatic vegetation surveys (including exotic emergent aquatic plants) and analysis of vegetation data. Lake aquatic vegetation surveys using a combination of methods including the Aquatic Vegetation Assessment Site Survey (AVAS) method endorsed and required by the Michigan Department of Environmental Quality (MDEQ) protocol for aquatic vegetation surveys will be conducted on Magician Lake each spring and fall. In addition, regular post-treatment aquatic vegetation surveys will also be conducted. The entire littoral zone of Magician Lake will be surveyed for all aquatic vegetation growth forms, including non-rooted submersed, rooted submersed, floating-leaved, and emergent vegetation. Each species and their relative abundance will be documented for each sampling quadrat. In shallow offshore areas, GPS grid points will be recorded using the Point-Intercept method (U.S. Army Corps of Engineers, 1999) to assure that the entire littoral zone has been surveyed. Data will be tabulated in a relative abundance and frequency table and each aquatic plant will be described in detail. Such detail will include the common name, scientific name, type, growth form, relative abundance, and importance of each specific aquatic plant within Magician Lake. The GPS data points will serve as constant baselines that are uploaded into a 50-satellite GPS WAAS-enabled depth sounding unit (accuracy within 2 feet) and will allow for long-term monitoring of the Magician Lake aquatic vegetation communities with time.
5. Periodic water quality sampling (which includes the parameters of water temperature, dissolved oxygen, pH, turbidity, total dissolved solids, oxidative reduction potential, conductivity, total phosphorus, and algal species at the Deep Basin(s). Also, soils analysis and Best Management Practices (BMP's) will be developed for the lake as well. At Deep Basin 1: At a profile from depth = 0 feet to depth = 40 feet, total phosphorus, total kjeldahl nitrogen, and total alkalinity will

be collected at the top, middle, and bottom depths. At 10 feet intervals, parameters such as water temperature, dissolved oxygen, pH, conductivity, secchi disk transparency, total dissolved solids, turbidity, and oxidative reduction potential will be assessed. At Deep Basin 2: At a profile from depth = 0 feet to depth = 30 feet, total phosphorus, total kjeldahl nitrogen, and total alkalinity will be collected at the top, middle, and bottom depths. At 10 feet intervals, parameters such as water temperature, dissolved oxygen, pH, conductivity, secchi disk transparency, total dissolved solids, turbidity, and oxidative reduction potential will be assessed.

6. Preparation of a Magician Lake annual progress report (primarily updates on the current program and proposed future plans will be presented each fall- the reports will include water quality data, aquatic vegetation survey results, detailed data on both pure strain milfoil and (if present) hybridized milfoil, documentation of the GPS and AVAS grid point aquatic vegetation survey GPS locations and map of milfoil and aquatic plant species, and verification that all contractor activities were successfully executed.

7. Attendance at any public hearings of practicability and/or assessment roll for the current or future treatment program(s). This includes attendance at both hearings. Coordination of the hearings with both Silver Creek and Keeler Townships (if applicable) will be facilitated.

Part II – Payments to Consultant

1. The total cost of consulting services for this contract will be at a total annual lump sum cost of up to $7,000 for all work listed in this contract. Payments are due quarterly in an amount of $1,750 within a net 15 day timeframe as invoiced by Restorative Lake Sciences, LLC. Furthermore RLS understands that funds are not paid by the Magician Lake Improvement Association but rather by Silver Creek Township. Payments may begin only after the Special Assessment funds have been collected by the township. If all of the services in this contract are not utilized, then a cost-reduction would apply based on the cost of the associated service.

2. For additional evaluation items requested by the Boards, the Consultant will be paid an additional amount agreed upon at a billing rate of $85 per hour by both the Boards and the Consultant.

IN WITNESS WHEREOF, the Boards and Restorative Lake Sciences, LLC execute this agreement.

Consultant

By_____
Jennifer L. Jermalowicz-Jones, PhD
Water Resources Director
Restorative Lake Sciences, LLC

Magician Lake Improvement Association Board

By_____ – for review purposes
Magician Lake Improvement Association Board

Silver Creek Township Board

By_____
Silver Creek Township Board