Aquacleaner Environmental

"Leaders in the field of Waterfront Restoration Technology"
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Operational Protocol For State or Local Regulatory Agencies
Aqua Cleaner Suction Harvester or Suction Dredge

Back ground: Aquacleaner Environmental has refined and developed technology for suction harvesting, and spot dredging, as a means of controlling and reversing the infestation of invasive plants that are overrunning lakes and bodies of water throughout the US. The current technology that is in use only masks the problem long term and appeases those affected short term. We believe that the removal of these invasive plants in their entirety, with as much of the rooting system as possible is truly the best way of offering longer term relief and with continued use, long term reduction of their spreading.
We also believe that lakes and bodies of water are altered through time because when water travels, it brings things with it that can begin it's demise or at the very least result in less enjoyment for the users of it (run off filling in a waterfront shoreline with silt). We have seen a cycle occur in the water where organic material even from leaves blowing into the water at the shoreline, forms a layer of silt, which then allows invasive plants to grow closer to the lakes shoreline. They die every year, decompose, turning into silt, releasing more seeds of invasive's and then blooming next season with more density. The removal of various types of material from a lake only helps to restore it to the condition it was years earlier. A hard pact bottom makes it harder for aquatic vegetation to flourish, and for the weeds to take hold and multiply. Aquacleaner Environmental is dedicated to restoring individual waterfront properties and lakes as a whole in an environmentally friendly and conscious manner.

Premise: That removing invasive aquatic vegetation by there rooting system and removing them out of the water in their entirety, is the best way to slow down the spread and start reversing the infestation. Removing the silt build up and bringing the bottom back to its original condition, only helps reduce the re growth.

Issues: This is always a trade off between being in business and operating in a manner that conforms to the rules and regulations of an agency such as the DEC. While operating in the water brings with it certain sensitive issues, my hope is that my company can address any concerns that the DEC has and develop a framework that allows my company to function efficiently and conform to your regulations.

A) Marine habitat – The technology of our machine allows for a fish to sucked into the nozzle, and come out swimming on the other end, where the person operating the bagging system can remove it and place it back in the water. The operation of this equipment can be timed so as to not disturb the marine habitats and our company methodology has been that we do not start operations until spawning season is over or in some cases prior to it's commencement.
B) Water quality – A major issue of concern for several reasons;
The Disturbance of the a lake bottom and what it might case in residual affects, and the spreading of turbidity over a large area I'm assuming is your offices biggest concerns relative to our process. The idea that working through years of organic material that has accumulated will release elements in the water column like Nitrogen, Phosphorus, BOD's that will result in blue green algae or other forms of algae is a tangible one depending on the severity and method of the disruption. Our experience with over 7 years of use with the Aqua Cleaner machines show signs of this occurring.
As you are well aware each lakes bottom will vary in it's consistency and it's composition. Firmer bottoms with sand, rock or clay, will only cause a minimum turbidity cloud, one that typically doesn't spread very far, and settles very quickly (typically with in 30 minutes or less).

Silted in area's do create a larger turbidity cloud that will spread in approximately 100' circumference with calm tides. Use of a turbidity curtain will contain this easily.

An important point worth noting is that our water quality study has shown that our machines and the method in which we use them does not cause algae blooms or any residual affects to an area we have worked. We have had extensive use on several lakes with multiple machines and never heard of any after affects that had resulted. Our study was conducted in a 2-acre pond with a silty bottom and wall-to-wall infestation of an invasive plant. During this project we operated 2 machines for almost 6 weeks, removed over 2400 bags of vegetation and the only noticeable spikes in the water column resulted during a 2-day heavy rain where we were not even working.

We believe we have had great success because while some organic silt does get disturbed by our hand pulling of plants, and silt does mix with water and end up at the back of the machine as turbulent water, that this causes no bi products or after affects. Since nothing ever passes through an impeller and the composition of the sediment is not altered, we feel it came out the same way it went in, and is not an issue. The benefit of removing the invasive, and subsequent silt far out ways the risks of leaving both in the water body.

C) Disposal – The disposal of aquatic vegetation is always part of our companies on site plan and varies depending on what the history of the lake is relative to chemical applications. We learn the history of a lake typically from the client and the lake association. When there is no problems we generally have our clients dispose of the vegetation through normal organic compost from their local municipality or as a community compost pile.

Short-term removal vs. long-term health.- Until recently our work has been primarily for individual homeowners but our goal to build larger more industrial sized machines to start cleaning lakes as a whole. We feel that the weed harvesters are only causing an increase in the spread of invasive plants and have seen and heard from enough clients on different lakes to see that our technology can offer better short term results and through continued seasonal use, long term results as well.

Objective: To develop a working relationship and protocol that can exist between UWS and the DEC concerning suction harvesting and the restoration work my other machines are capable of.

Technical Information: While it's true that what we do under the water is unseen, what we do should make sense because of the logistics involved with using our equipment.

A) Suction Harvesting - The perception that a diver just vacuums the lakebed of invasive weeds is incorrect and actually not functional. A diver holding a 5' hose and placing it on the lakes bottom would only find that the nozzle was full of plants and large rocks that would encompass the entire hose and jammed it up, making it unusable for additional plants and material. Instead what we do is hold the nozzle between our legs a foot or so from the lakes bottom, and let the stem and top of the plant go into the nozzle, which lead us to the roots of the plant on the bottom. At that point we stick our hand into the soil and literally pull the roots up and feed them into the nozzle. There the plants are transported up to the barge where they are bagged and removed from the water.

B) Dredging – Our dredge machine and our methodology is probably the least invasive form of dredging in the industry because it barely disturbs the bottom other than the immediate area we are operating in. The norm in the dredge industry is bigger and faster at the expensive of stirring up the bottom and leaving a large turbidity cloud. The 2 methods of dredging are pumps and mechanical excavators. Neither technology actually has somebody in the water operating the equipment from the lakes bottom. We have created a system we call Aqua Dredging where we have a diver sit on the lakes bottom, a hold a control rod that has a small water agetater and behind it a 3" suction hose behind it. The hose has a cage surrounding it with 2' holes so that nothing to big can get into the suction line. In some cases (like pure organic silt) we don't need to use the agetater because we can control the nozzle's height off the bottom and let the hose mix water and silt together and thus create it's own slurry. This barely disturbs the lakes bottom but it is an effective methodology that allows us to remove 10 cubic yards an hour and create a minimal turbidity cloud.

De Watering - Because we pump a low volume of water, and a high concentration of solids, we are able to contain, separate and manage the spoils with ease. Our process is a 2 step filtration process. First we pumps the water and the spoils into a de watering, geo textile bag made to size to fit the clients property. This allows water to filter out with good clarity but then we add the second step. Building a berm with hay that surrounds the de watering bag, and has a woven fabric that has very dense holes and allows the water to be filtered to an even cleaner level.

Turbidity – Whichever type of project we are doing we start with building and placement of a turbidity curtain that's built with fabric that is the same as the de-watering bag. We use buoys to keep the curtain floating, and a weighted bottom, to keep it hung below towards the bottom. Our typical depth of the curtain is 6'. The curtain is a key component to maintaining the water quality in the area's that surround the work site. While the area within the curtain will contain turbidity, the area outside the curtain remains clean.

Issues surrounding Dredging – When looking to perform dredge work, we are aware of the concerns of the DEC.

- What is in the soil, dictates where that material ends up.
- How and where it is de watered or pumped depends on the surrounding landscaping
- Why an area needs to be dredged relates to a clients usage or in the case of coves or areas where run off from a stream or storm water runs off a matter of function ability (like a marina or boat dock)
- Where an area to be dredged is located is an issue relative to disturbing sensitive ecological area's

Proposed format when permits are required:

I am proposing a plan whereby UWS can have easier access to permits so that I can accommodate the needs of my clients in a timely fashion. Typically a season lasts only a few moths so that the urgency in permitting is a key aspect to our business success but also so that the client can get as much use of their cleaner property during the season.

While I am familiar with the key aspects of obtaining a permit my hope here is to establish a set business protocol and methodology that is acceptable to your office and then have a series of criteria that I can work with each permitting office in the winter to help facilitate permits pre season and an expedited permitting process during the season

Protocol For Suction Harvesting

1) Define area's to be worked on

2) Define types plants to be removed
3) Agreed procedures for use of the machine
4) Use of turbidity curtains when the area to be worked on meets certain requirements
5) Set disposal procedures
6) Time frame for seasonal operations depending on each particular lake and the areas that are hot spots.

Protocol for Permitting

1) Defining what Lakes and types of aquatic vegetation removal we are looking at working on
2) Pre season notification (during the winter)
3) Diagrams of each job to be done
4) Defining Hot Spots on a given Lake that we need to use a more conservative approach (removing partial amounts of plants or silt) in area's that can be ecologically sensitive. Example: Lilly Pads in a wetland. Instead of complete removal perhaps partial removal so the client can have a useable area to enjoy while leaving some of the patch intact for environmental purposes. When necessary possibly using hand removal only with no machine present.

Preseason – While things are slower for your office (assumption) and for us, we can work with each office to notify them of potential clients that have expressed interest and the lakes they are on, for our services for next season. I believe that this would be a huge value because it allows for your staff to do their backgrounds on each lake as a whole and for the individuals already interested and give me the criteria they want me to met as well as any Hot Spots that are of concern. My interest here is to be able to expedite the process during the following season by not having to wait for one or some of your staff to do on site inspections.

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During the season – To allow my company to notify the DEC section of each new client interested in work, provide a site map, with a description of the property (including what the composition of the bottom is, what the surrounding landscaping is like and a diagram of each specific area for proposed work). Then to have an expedited permit that can be issued in days not weeks or months.

Hot spots on a given lake – Wet lands whether protected or not, water ways that are used for drinking supplies or that run into tributaries that feed into reservoirs for drinking supplies. Plus area's that may ecologically sensitive, with a list of restrictions or requirements that can allow for work to be done in those areas.

Lake Wide Permits: A Lake wide permit would be the best scenario for my company because it would allow me to just send over a site diagram with the necessary information provided and allow us to have a minimal time delay in getting into a job with spot permits and their parameters, inspections or familiarity of property.

Lake management: While it's true that as a business my goal is to create profits for my company the more altruistic goal is the cleaning up of lakes and large bodies of water with a short term affect that's going in a long term direction. In striving to reach that goal, we educate our clients that the removal of all aquatic vegetation is not our objective but rather the restoration process involves replaces noxious, invasive, aquatic vegetation with native plants that will not choke a body of water but rather enhance it to keep the ecosystem intact and flourishing.

My hope is that your office and my company can work together as I do in several other states where offices such as yours have realized the value of my technology and methodology and where we work hand in hand to address problems that few other companies or technologies can achieve similar results.

It starts with my simple premise but really comes down to people enjoying their waterfront properties and starting to reverse some of the issues that I have addressed in this proposal.