

# Aquacleaner Environmental

"Leaders in the field of Waterfront Restoration Technology"

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## **The Aqua Cleaner Suction Dredging System vs Traditional Hydraulic Dredgers**



**Background:** Aquacleaner Environmental (AE) has refined and developed technology for dredging as a means of restoring and reclaiming lakes and ponds by manufacturing a small dredge pump and a unique system that delivers impressive results. Typical issues involved in the permitting process focus on the disturbance in the water and up land. Our system offers the means to remove accumulated organic sediment with a minor, short term impact in the water and because we don't move large amounts of material at any given time, we can manage what we move up land with minimal impact as well. Our system is so unique that it was featured on the discovery channels show "Dirty Jobs".

**Premise:** Removing the organic silt build up that has accumulated over time and bringing the bottom back to its natural condition, will aid in the restoration and reclamation of a water body by reducing the nutrient load, removing layers of dead decomposing invasive plants and reclaiming the natural bottom.

**Science & Dynamics:** Dredging is no longer a nasty eight letter word but rather the natural progression in the remediation of your water way because you are removing the biomass and nutrients that have accumulated over the years in an environmentally sound manner. Firming up the bottom and removing the layers of fragments of invasive plants along with the organic silt has been shown to reduce the growth of invasive plants and prevent algae blooms. Our machines are designed to only extract the soft organic material and not change the natural hardpan contours of your bottom.

## **Aquacleaner Suction Dredging vs Hydraulic Dredge Systems(HDS)**

### **In the Water**

**Set Up-** Our equipment is small and portable and is carried off a utility trailer to the lakes edge, where it is assembled on shore and placed into the water. 3" and 4" hose is then run from the machine to the site of the staging area.

HDS come off a semi and require a large piece of construction equipment to place it in the water. The norm is 6" or larger pipe, which is assembled and put into place.

**Turbidity Curtain** – While all such dredge projects will require the use of turbidity curtains, the amount of turbidity created and the ability to contain it is where our system differs dramatically. Hydraulic dredge systems typically use an auger or cutter head to turn up the bottom and create their slurry (mixture of water and sediment). Their very nature is to alter natural bottoms of various densities and deepen water. Our system entails a diver manually holding a nozzle off the bottom or shooting the bottom with water to create the slurry. This creates a minimal turbidity cloud, which can be compared to that of suction harvesting and is very manageable.

**Marine Life** – Our dredge heads have openings that are 1 ½" so that nothing larger than that can enter the intake hose.

### **Upland**

The differences between our system and hydraulic dredging relative to the activities upland are significant.

**Staging Area** – An area will have to be set up that allows for the placement of the de-watering bag. We look for locations that are flat, clear and close to the watercourse so that water management is simplified. Since we move less water at any given time we can manage what we move with less space, which allows for easy removal with minimal disruption.

**Staging Area Components** – 6mm plastic is placed on top of the ground before the erection of the staging area. This protects the ground and allows us to direct the flow of the discharge water. A bag is then placed on top. A hay bail berm is created that surrounds the entire area and is supported and reinforced by rebar and rope. A layer of "felt like" fabric is then placed inside the berm so that all discharge water out of the bag can then be filtered a second time before exiting back to the water source. Not moving large quantities of water at any one time allows us to manage the return water using a minimal amount of space up land

**Return Water** – The water that exists the bag and then is filtered is known as return water. Managing this water over the duration of a project is important so as not to create ruts or wash additional soil back into the water source. We also don't want to flood any areas upland. Return water filters out with good clarity from the de watering bag, but then passes through a permeation berm where it's filtered to an even cleaner level and allowed to return to the source. The remaining water slowly leaches out and over a short period of time, the silt contained in the bag will harden and can then be removed

**How It Works:** The traditional method for removing soil entailed having a large construction excavator operate either from your dock or out on a barge. This process is imprecise and not very effective. Scooping large volumes of soil from a water way is intrusive, disrupting the ecosystem and doesn't afford a close tight cleaning. Pumps are the preferred method of dredging but the norm in the industry is large, aggressive machines, which move huge amounts of water (1500gpm and up) along with sediment and are very hard to manage in a small-contained area like the backyard of your lakefront property.

## **Bigger is not always Better**

Standard dredge machines move large amounts of sediment that are accompanied by large amounts of water, 1500gpm and higher, their slurry mixture is mostly water and less sediment. As a result the amount of space that is required to de-water this slurry is also significant. A logistical aspect that typically is hard to accommodate. Our Aquacleaner machines move only 300gpm, with a significantly higher percentage of solids, which allows us to manage our slurry in a smaller, confined area.

Hydraulic cutter and auger heads cut into the bottom and create large amounts of turbidity in the process, which can be difficult to manage as opposed to our method of suction dredging. They cannot just remove small depths of sediment because by nature they are designed to permeate hard bottoms and create substantial depth. This hand's on approach allows us to overcome the obstacles and challenges that lakes and ponds inevitably bring and has made UWS the leaders in water front restoration

