KE0KOY's Lake Water Purification Method

Step one:

Determine how much bleach you need experimentally by setting up several 5 gallon buckets of lake water next to each other and to each add progressively more bleach than the last. Example, add a quarter teaspoon to the first, a half teaspoon to the second and so on noting the amount on each. When the bacteria die, it turns dark. Find the first bucket that shows no further darkening indicating a complete kill. This is the proper amount of bleach to kill the bacteria in all subsequent buckets for the next month or so. Retest every month as the lakes biology changes with the season.

Step 2: Bleach all buckets and let them sit overnight.

Step 3: perform an electrocoagulation.

A bit of info on that… First of all, you have everything you need at home to do an electrocoagulation, don't let the term scare you away! Electrocoagulation uses electricity (12v from a car battery) and an aluminum anode (to + terminal) and a steel cathode (to – terminal) to separate suspended particles. Several things happen at the same time. The anode will liberate positive aluminum ions into solution, which, at first, removes the - charges on the suspended particles allowing them to fall out of suspension. At the same time the aluminum is also reacting with water to form an insoluble aluminum hydroxide (alum is aluminum hydroxide/sulfate), a gel like substance that captures the particles which are carried

up to the top by the electrolysis bubbles. After a period of time, typically an hour for me, the water will have a nasty looking layer on top and maybe some settled to the bottom, but the main volume in the middle will become substantially more clear than the original dead water. Stop here


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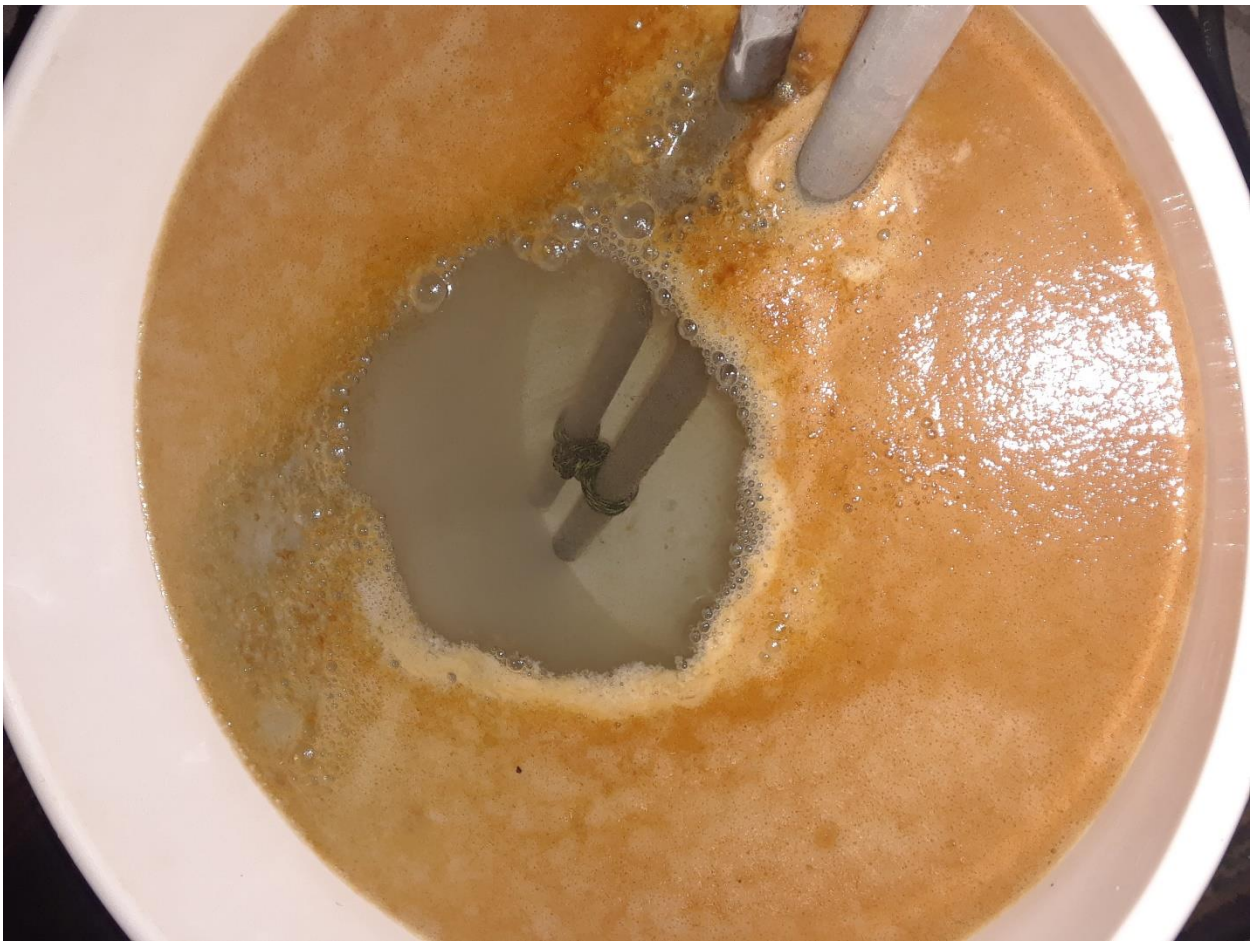
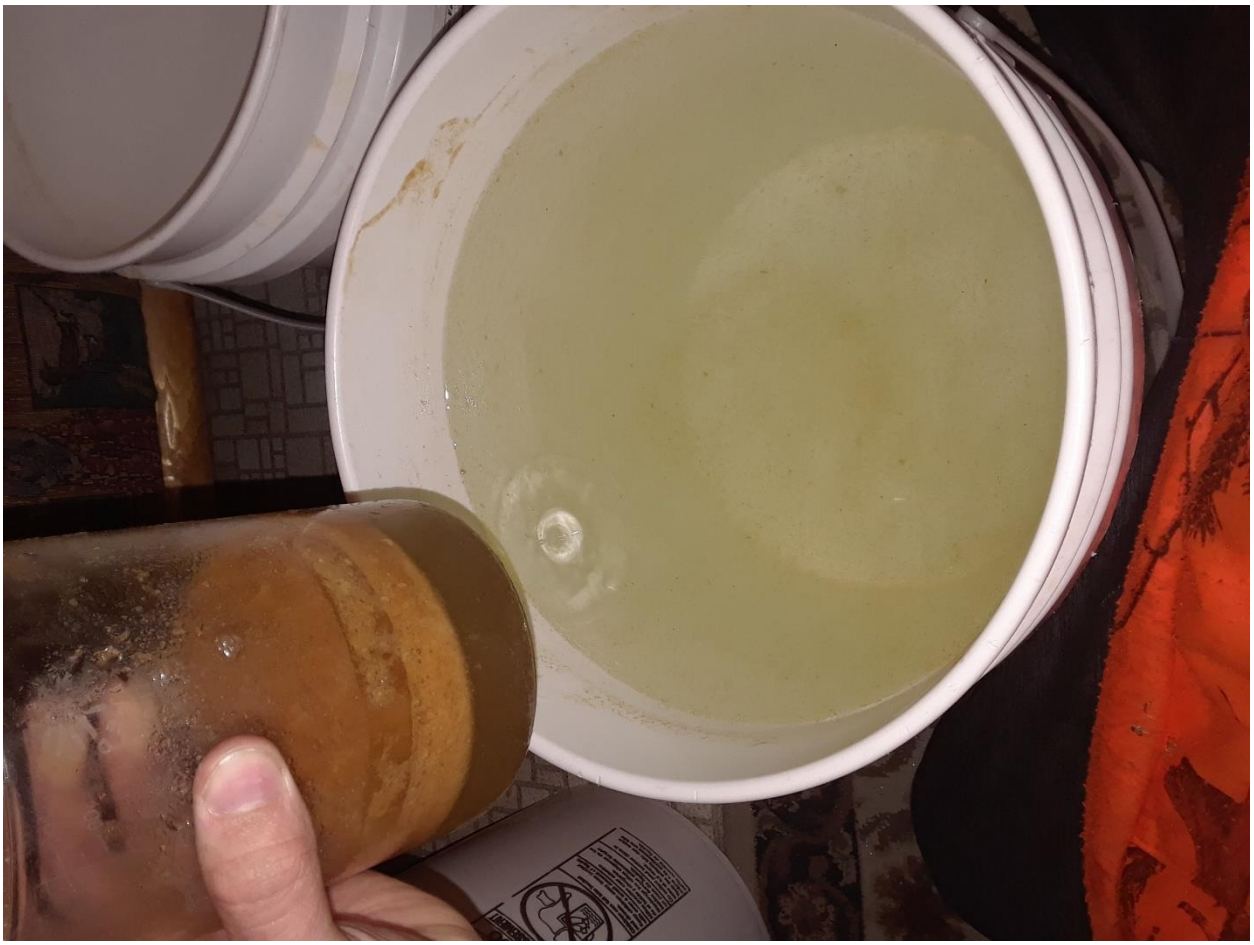
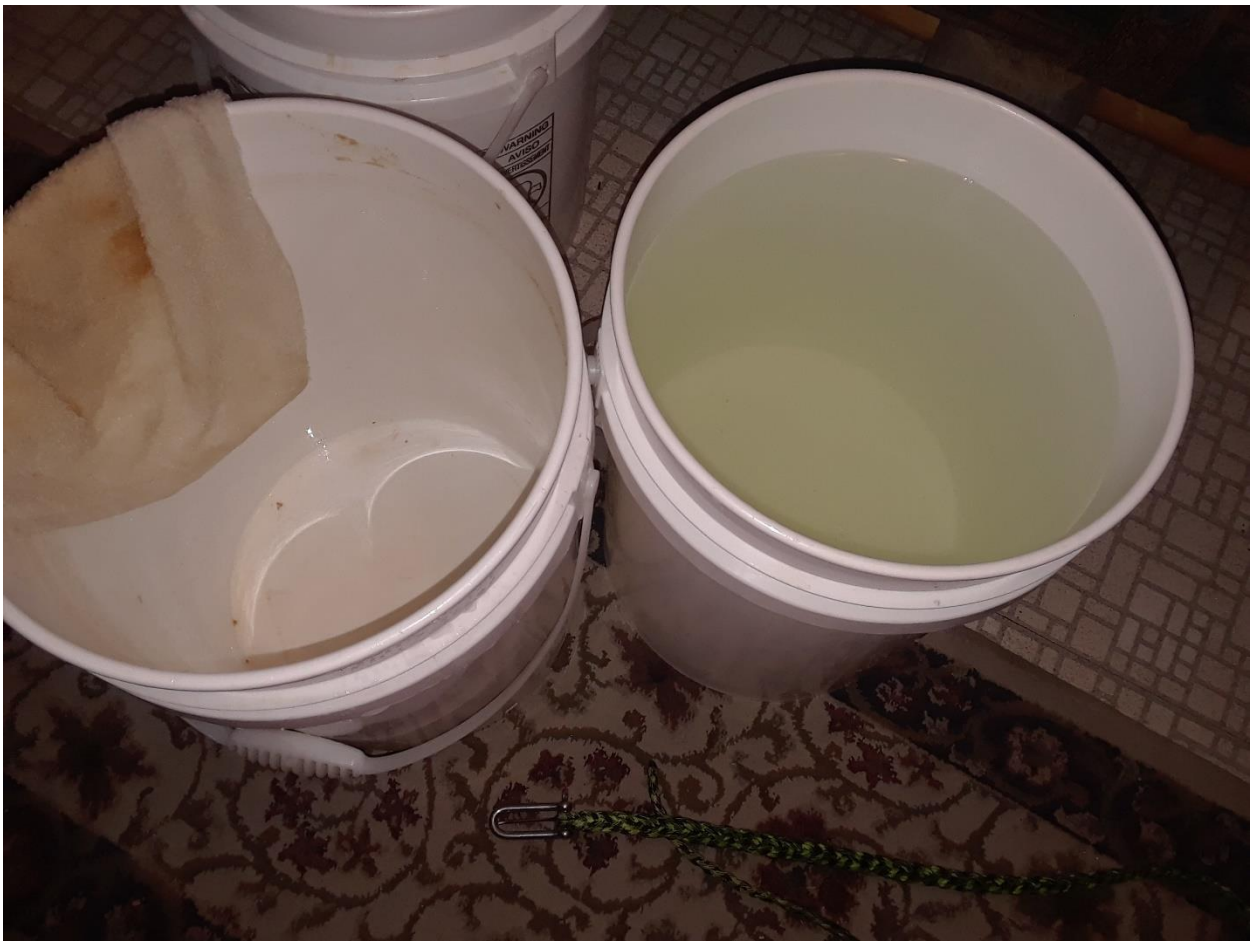


Step 4: using a cup, carefully submerge it and scoot the top crap with your fingers into the cup (without stirring it back in or wasting too much water). Discard that. If you skip this step, the gel will immediately plug the towel in the next step.



Step 5: using a belt, fix a common bath towel or thick rag to the top of an empty bucket and carefully pour the remaining liquid through it to catch the rest of the suspended coagulant. This should take only a minute if the above steps are followed and care is taken to not mix the floating crap back in during step 4. The towel is then removed and rinsed twice with a splash of water and is ready for reuse.



Step 5: run liquid through 1 foot clean sand.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Portable Operating

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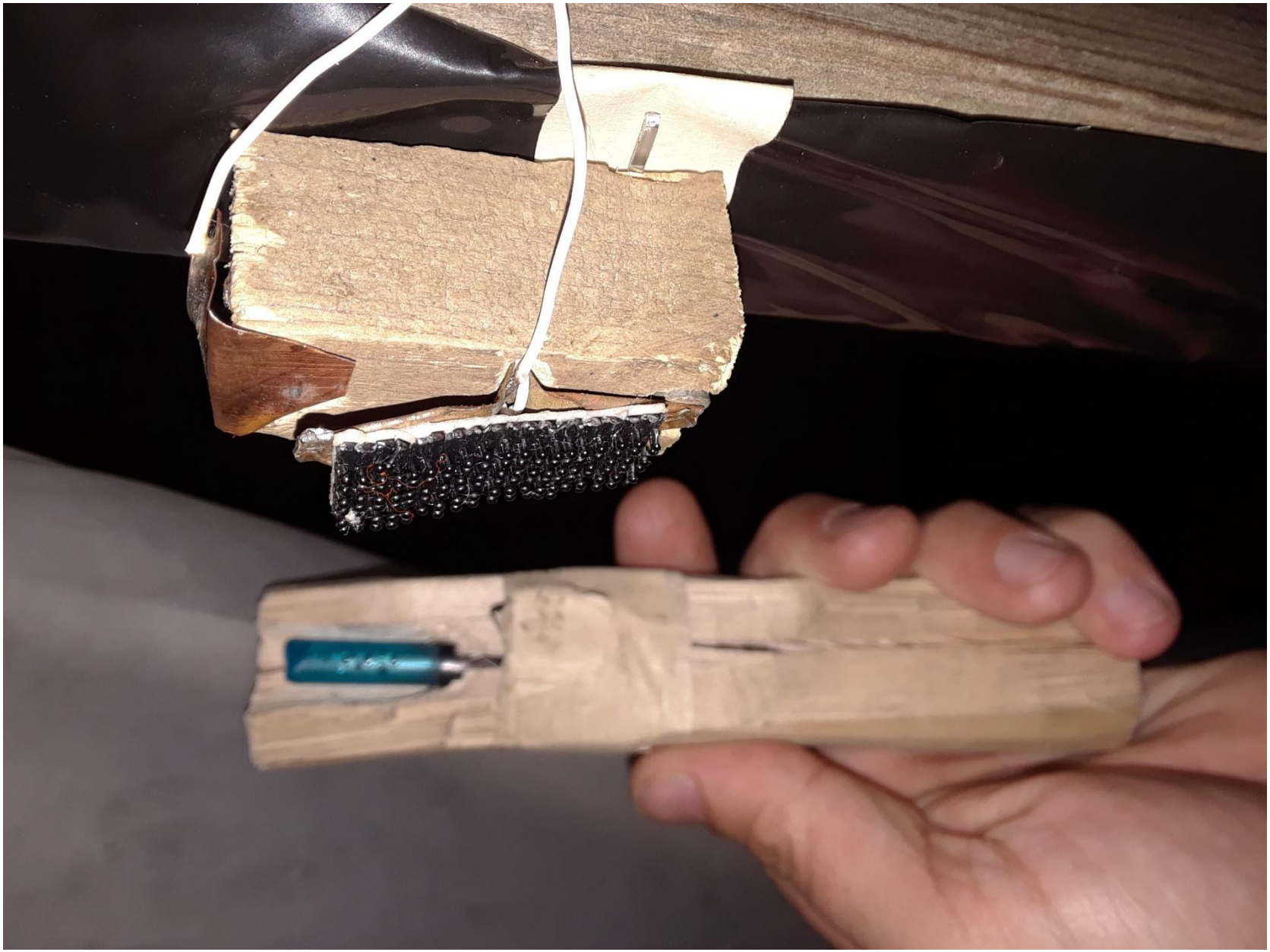
Optional steps and notes:

Electrocoagulation does not remove infinitely soluble substances and cannot remove metals lighter than calcium. The resulting water will have a pH around 8 due to the bleach. This is ok as most electrolyte water is 8 anyhow. If you want to cut down on the city water smell and lower the pH a bit without adding chemicals, simply use an aquarium bubbler to bubble air through the water while in storage. This forces the chlorine out, and, due to the CO2 in the air, the resulting calcium hydroxide (bleach minus chlorine) will form calcium carbonate and become far less soluble. Be extremely careful handling the electrode while connected to the battery. There is no fuse (due to my laziness) and wedding rings will instantly melt to your finger if caught between the rods! Mine averages one half ampere draw.

The filter is set up to be fed via siphon to minimize effort. The filter is just a foot of sandblasting sand held in with a t-shirt. There will be times where the filter slows down to a drip instead of a steady stream. If this happens, use a stick and gently stir the top inch of sand to push the trapped coagulant gel out of the way. Eventually, you will need to replace the sand, however, I just rinse it well and reuse without issue. Note the chunk of wood! When the top bucket gets empty, the filter will tip it over without the added weight!

I take no responsibility for anything you try, of course ☺

And as promised, I'm adding pics of my off-grid winter shower. The homebrew toggle switch has magnets under the contacts and works very well. Everything but the grain bucket on the floor and ford windshield washer pump is homebrewed. Enjoy!




WARNING
AVISO