

Clean Marine Solutions

Marina Wastewater Compliance Systems

As featured in the 2011 December issue of Professional BoatBuilder magazine:

Clean Marine Solutions' Manual Powerwash Wastewater Treatment System

Clean Marine Solutions manufactures wastewater treatment and recycle systems designed to remove heavy metals and other contaminants that are typically found in powerwash wastewater. Our VANISH systems are automated and come with all necessary sensors, pumps, mixers, tanks, valves and plumbing. Treatment operations and processes are monitored and controlled by our proprietary Programmable Logic Controller (PLC). The VANISH product line has systems capable of treating thousands of gallons of wastewater daily with the push of a button.

We realized that in this tough economy, some small boatyards and marinas would have to cease boat-washing operations or face fines from environmental compliance authorities. We have developed a low-cost manual wastewater treatment system that produces clarified water to the same industry leading standards that our VANISH systems produce.



Frequently Asked Questions:

Why not simply have our wastewater hauled off-site? There are several reasons. But the bottom line business reason is that treating wastewater on-site is much cheaper than having the wastewater hauled-off.

For example, assume your yard generates 3,000 gallons of wastewater per year. Haul fees are generally \$0.60 or more per gallon. So the annual haul fees would be \$1,800.00 or more. An increasing number of licensed waste haulers now require the testing of wastewater to determine precisely what chemicals / toxins are in the wastewater BEFORE they will pick it up. These tests can easily cost from \$250 - \$500.

The Manual Treatment System's supplies cost about \$0.03 per gallon or about \$90.00 for 3,000 gallons.

Cost Comparison	Qty. Wastewater generated annually	Haul fees vs. supply costs per gallon	Annual costs
Haul-Off Site	3000 gallons	\$ 0.60*	\$1,800
Manual Treatment System	3000 gallons	\$ 0.03*	\$90

**Supply costs are good faith estimates and are not guaranteed. Chemical costs, like all commodities, are subject to fluctuations. Each yard's savings will vary.*

With our manual treatment system, you can pay for the system and maybe save a couple of hundred dollars in the first year. In subsequent years, your annual savings may be more than \$1,000.

How hard is the system to use? An employee who can properly mix resins and paints could be trained to perform treatment in less than thirty minutes.

Wastewater is pumped (pump provided by yard) from the washdown pad into the treatment tank.

The operator can treat any quantity of wastewater in the tank at anytime.

For example, a yard accumulates 100 gallons of wastewater and decides to treat the wastewater.

In the manual, a standard recipe is provided that will most likely cause the wastewater to clarify quickly. The process is forgiving; it works well even if the precise quantities are not added and/or the wastewater is dirtier.

Particulate is clearly seen settling out of the wastewater one minute after stirring in last chemical



The clarified water would most likely meet discharge to sewer standards. (We will help you determine this before purchase.) But some locations do not allow any industrial wastewater whatsoever to be discharged to sewer and some allow it but make it so costly that it is not the way to go.

A small boatyard can easily be drip the clarified water onto their impervious washdown pad where it will evaporate. *(It is difficult to conceive of environmental compliance authorities objecting to the evaporation of clarified wastewater with fewer metals than drinking water. BUT, to be sure, check with your compliance officials.)*

System Setup

Solution Preparation - After the tank is setup, the chemical treatment solutions are prepared. The concentrated chemicals must be diluted with tap water. Dilution is very simple because the chemicals come in pre-measured.

A labeled 5-gallon bucket is provided for each of the three chemicals. Each bucket has a “fill to here” line. The operator simply adds water to each bucket to the marked line. They then add the contents of the respective chemical to its corresponding bucket and stirs. Voila! , the solutions are prepared.

Dry NaOH powder in pre-measured container

Diluted solution of NaOH is prepared by filling the NaOH pail with tap water to the fill-line. The contents of the dry NaOH container are slowly added to the water and stirred.



Dedicated NaOH mixing pail

Fill line

A container of CMS NaOH will treat approximately 2,500 gallons of wastewater

A Typical Day Using the Clean Marine Manual Treatment System:

The operator notes the gallons of wastewater in the treatment tank by reading the increments on the tank. Using the standard mix ratio, they calculate the amount of treatment chemicals that must be added. For example:

Solution	mL per gallon	Quantity to be treated (gallons)	Gallons of Solution Required
Dilute NaOH	3	100	300 mL
Polymer #1	3	100	300 mL
Polymer #2	5	100	500 mL

The 1st solution is added and stirred, then the 2nd is added and then stirred and the same for the 3rd solution.

Voila! , the precipitation of the metals and other particulate will be noticed in less than a minute.

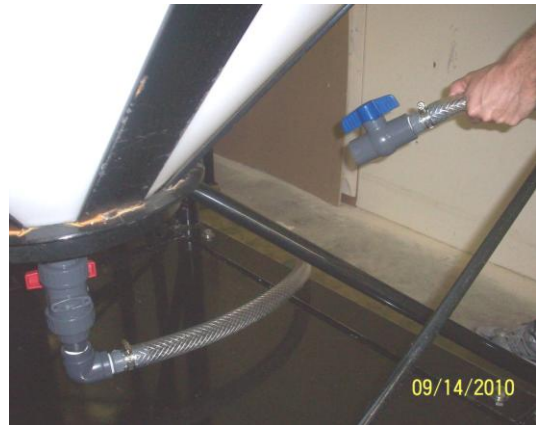
Particulate is clearly seen settling out of the wastewater one minute after stirring in last chemical



Clarified water sample 15 minutes after stirring in last chemical



Sludge from the 200 gallon treatment tank is periodically drained from the bottom of the cone- bottomed tank by opening a ball valve on the end of the sludge hose.



The sludge is poured through the dewatering filter. (Operator should be wearing gloves provided)



wearing

Dewatered sludge is periodically poured onto the drying pad. Once dry, the particulate is typically classified as a non-hazardous waste



The filter containing dewatered sludge is emptied onto the drying pad provided. Once dry, the heavy metals are in effect bound by the treatment chemical polymers. The dry particulate is typically classified as non-hazardous and can typically be disposed of in the dumpster with other yard trash. Before dumpster disposal, you must verify that your landfill considers the particulate non-hazardous.

Manual Powerwash Wastewater Treatment System includes:

- 200 gallon, UV resistant polyethylene cone bottomed tank with powder coated steel stand
- Tank sludge drain (includes 2 ball valves and 6 ft reinforced hose)
- Hose spigot to drain treated (clarified) wastewater
- Sludge dewatering bucket, 6 reusable filters and drying pad
- Treatment Chemicals for 3,000 gallons of wastewater
- Calibrated mixing buckets with safety pour lids for each chemical
- Syringes to add chemicals during tests
- Spiral chemical mixer
- Pail opener
- pH test strips
- Personal safety protection (apron, splash goggles, gloves)
- Wastewater Treatment manual

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