

Water Treatment Solutions

Presents:

Water Recycling for Stone Shops



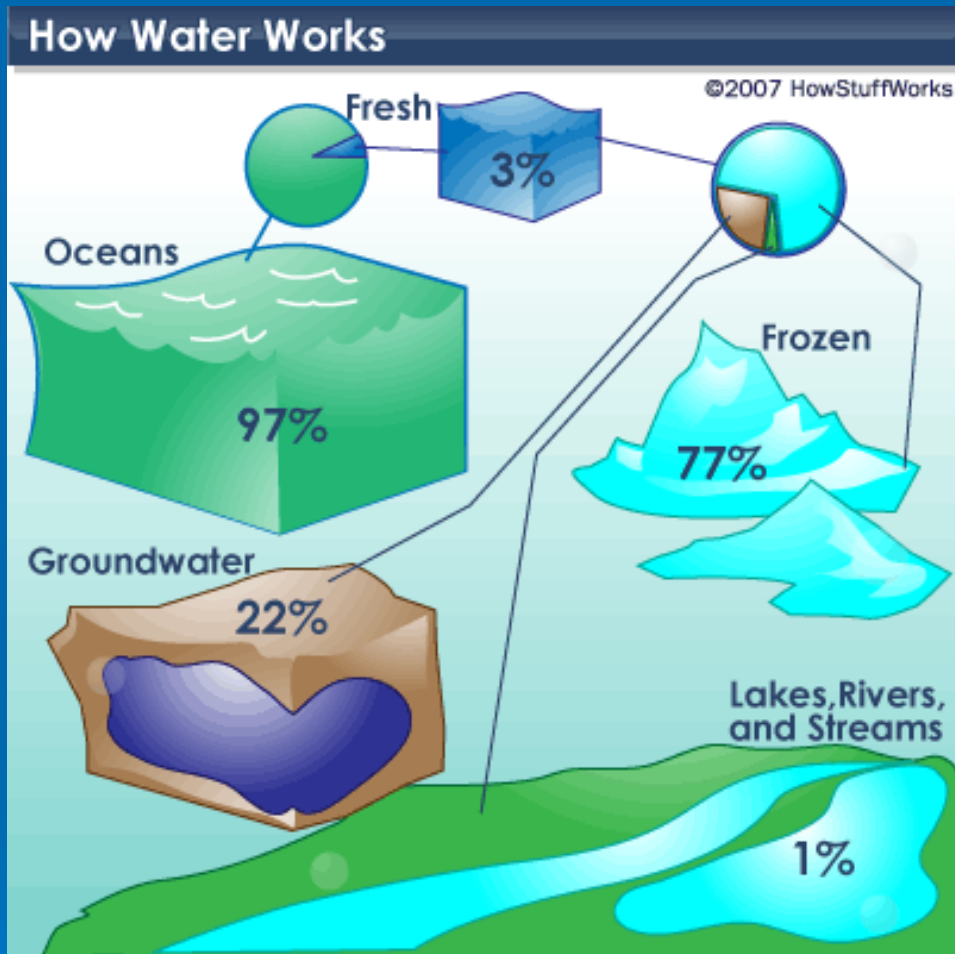


Water is a Precious Resource



- **70% of the earth is covered with water**
- **97% of that is salt water**
- **3% is fresh water**





Where is that 3%?

- 77% is frozen in icecaps and glaciers
- 22% is in sub surface groundwater
- 1% is in surface water (lakes, rivers & streams)

The Amount of Water on Earth Never Changes

The same amount is here today as when our planet was formed



**The only change is the form our
water takes...**

And Its Contaminants



100% of our Water is Recycled



Here are a few little known FACTS !!!

- A birch tree can transpire 70 gallons of water a day
- It takes 50 glasses of water to produce a glass of orange juice
- The average 5 minute shower uses 25 – 50 gallons of water
- The water you drank last, was consumed by 7 people before you

**Have you ever traveled to a foreign country
where you could drink the tap water ?**
(without suffering from Montezuma's revenge)



**Then You Know How Precious
Clean Water is...**



**We owe it to future generations
to do all we can to take care of the
limited fresh water we have**



How can you make a difference?



Water Usage in Stone Shops



- Used as a coolant and lubricant
- Used to convey solids away from the cutting surface
- Used to eliminate dust
- Usage ranges from 3,000 gallons/day at a very small shop up to 350,000 gallons/day at the largest shops

Silicosis



- Respiratory disease
 - Caused by inhalation of tiny silica particles
 - Irreversible condition; incurable
 - Prevention is critical
- More shops changing from dry to wet processing to minimize this serious hazard

The Clean Water Act of 1972



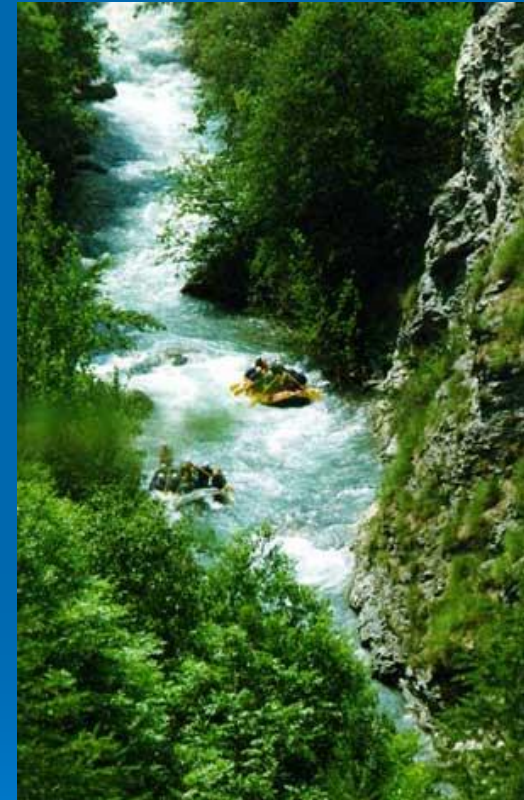
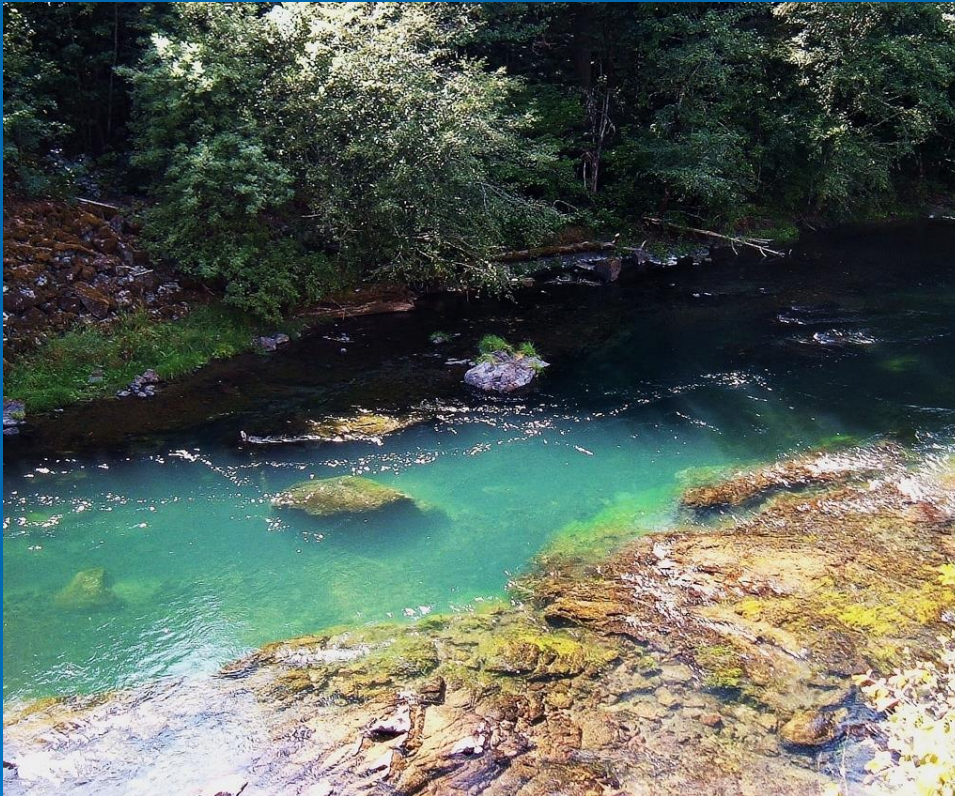
- o Established to clean our fresh water supplies
- o Dissolved oxygen levels in Lakes Erie and Ontario were nearly zero in the late '60s
- o The Cuyahoga River emptying into Lake Erie started on fire in 1969
- o Pollution of our water supply had to be slowed

What the Clean Water Act has accomplished



- Mandated and funded numerous municipal and industrial water treatment facilities
- Oxygen levels in the Great Lakes (and most rivers) are near safe levels
- Sport fishing and aquatic wildlife habitats are flourishing
- Pristine streams are carefully protected

In short, regulation is in place and is enforced to protect our water supply



How Does the Clean Water Act Affect Stone Shop Operations?

- ***“Isn’t this Act just for cities and towns?”***

- If you discharge any water, you are required by law to obtain a permit.

- ***“I simply let the pit overflow into a lagoon on my property. Nothing goes to the sewer.”***

- Lagoons leach into sub surface waters, also classified as waterways of the United States, just like rivers, lakes and streams. Actually the permitting requirement for this type of discharge is far worse according to the law than is obtaining a permit to discharge to a sewer.

- ***“I simply let the pit overflow to the city sewer or storm drain. Nothing goes to a stream.”***

- Contaminants in the waste water are regulated by the city since the water from your facility will eventually end up in a receiving stream of some sort. Over 50% of the names on the EPA’s quarterly list of non-compliant violators are cities and towns.
 - If you wish to discharge to a sewer, you must file the appropriate documents with the city or town requesting approval for such discharge . They will inspect your facility, test your waste water for thousands of contaminants, tell you how much water you are permitted to discharge and what treatment methods you must employ prior to discharge. They will also have the right to test your waste water discharge, without prior notice, to insure compliance. The process will cost you thousands of dollars, take months to receive a permit, you will pay annual fees thereafter, and will incur monthly charges for water and sewer usage.

- ***“What could be in the water that would affect the sewage plant discharge?”***

- Suspended Solids (stone slurry), resins, dyes, heavy metals, hydrocarbons, glycols, high or low pH, etc.

Fairfax County, VA



County of Fairfax, Virginia

To protect and enrich the quality of life for the people, neighborhoods and diverse communities of Fairfax County

NOTICE TO Marble, Stone, and Granite Fabricators

Release Date: January 2007

Fairfax County Wastewater Management is notifying marble, stone, and granite fabricators of sanitary sewer discharge requirements. Stone dust is prohibited from entering the sanitary sewer because of the potential to obstruct sewer lines and cause back-ups or release of untreated sewage into the environment. Fairfax County requires the installation of sediment traps or interceptors to prevent stone dust from entering the sanitary sewer. **Direct discharge of this wastewater to the storm sewer or ground is prohibited.**

Charlotte-Mecklenburg, NC



600 E. Fourth Street
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Fax 704.336.6586

March 10, 2008

Dear Business Owner or Manager,

In the past six months, three different stone fabrication companies in the Charlotte-Mecklenburg area were found to be discharging water from their stone cutting process to the ground outside of their buildings. This letter is meant to be proactive by alerting local businesses in the stone fabrication industry that such discharges are in violation of Federal and State law and local storm water pollution control ordinances.

The City of Charlotte, Mecklenburg County and the six incorporated Towns within Mecklenburg County have water pollution control ordinances that only allow, with a few exceptions, the discharge of storm water into the municipal storm water system. Process water resulting from stone cutting contains pollutants such as residue/sediment from the stone as well as lubricants and chemicals associated with the use of cutting equipment. A common response from the stone fabrication industry is, "Stone is a natural substance, so how can it be a pollutant?" Many natural substances, such as stone and dirt, are not pollutants until they are altered and/or displaced from their natural settings. When humans displace the substance from its natural setting and discharge it to the ground where it can be picked up by storm water and carried into a creek or lake, that's when it becomes a pollutant. The reason is that such substances cover up stream and lake habitat, clog drainage systems and waterways, and may contribute to flooding problems.

**How can a stone shop
avoid all this
regulation?**

Don't Discharge Water!



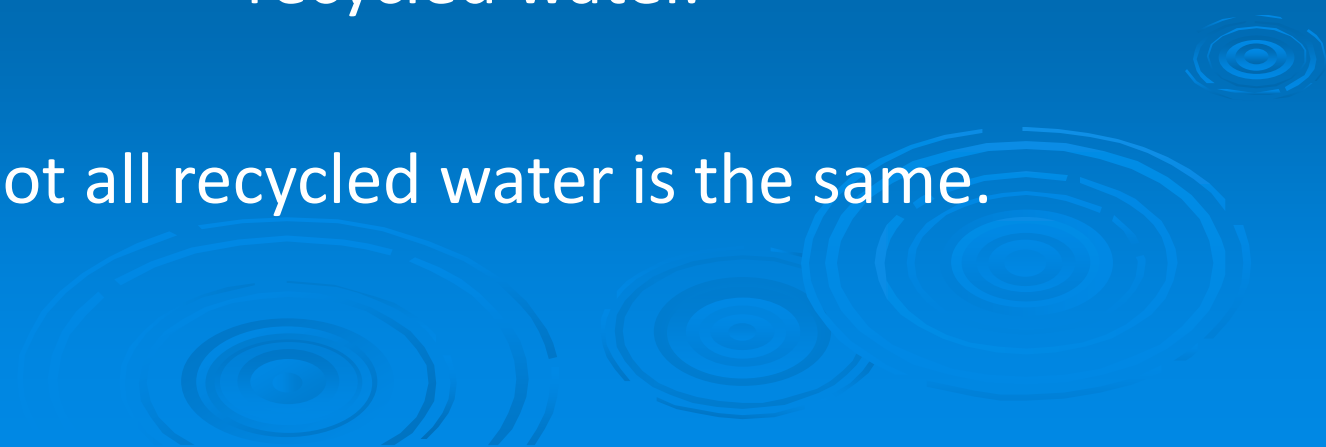
How is that possible?

**Water is critical to
my operation.**

Recycle the Water



Recycle

- Once stone fines are removed from the water, it can be effectively reused.
 - Different levels of treatment provide different levels of quality in the recycled water.
 - Not all recycled water is the same.
- 
- The background of the slide is a solid blue color. In the bottom right corner, there are several concentric white circles of varying sizes, resembling ripples on water. These circles are arranged in a way that they appear to be emanating from a point, with some overlapping each other.

What are the various levels of Treatment used in Water Recycling Systems?

- Simple Cascading or Settling Tanks
 - Gravity Settling Systems
- Centrifugal / Cyclonic Separation
 - Filter Press Based “Filtration”



Settling Systems utilize a series of cascading or overflowing tanks

1. Least expensive
2. Least effective
3. Typically only usable at bridge saw



Gravity Settling System



- Improved settling, using a cone bottom tank with integral clarifier
- Often incorporate flocculants to assist with settling
- Uses bag or small filter press to collect solids
- Produces higher quality gray water, requires additional point of use filtration to improve quality

Centrifugal / Cyclonic Separation



- Wastewater “spins” through cyclonic separator or centrifuge
- Solids are collected in a bag
- Produces higher quality gray water, requires additional point of use filtration to improve quality

Filter Press Based “Filtration”

- Removes nearly all suspended solids – to less than 2 microns
- Water is clean enough for reuse at all critical applications, such as CNC spindles & intensifier pumps
- No water added = no water discharged



Stone Shop Waste Water Discharge Options

1. Legal discharge to a city sewer or storm drain
 - Requires a discharge permit
 - Requires you meet the local waste water discharge criteria and that the proper forms be filled out and submitted
 - Typically requires a licensed engineer to approve of the treatment plan



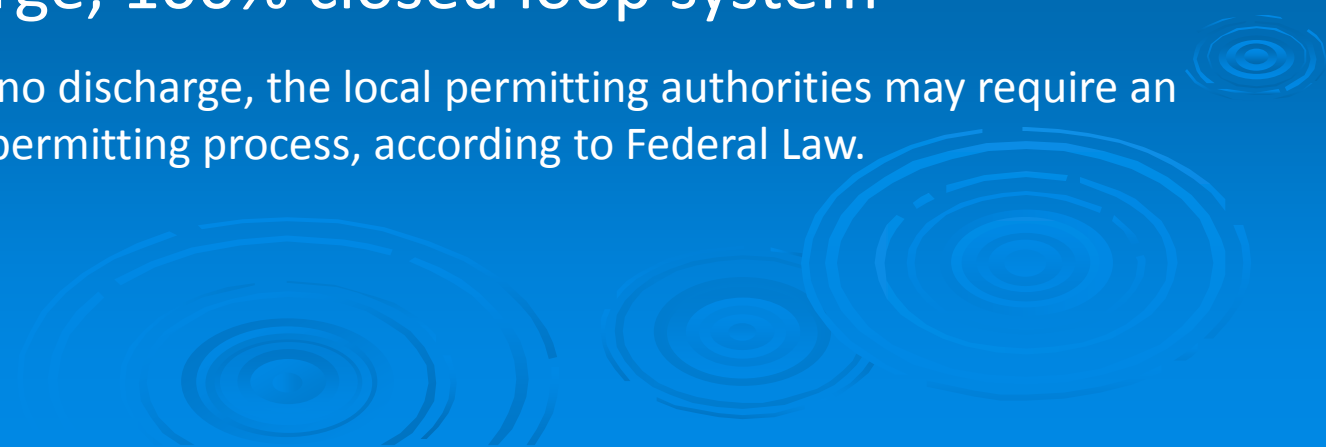
2. Legal discharge to a stream, river, dry well, retention pond, etc.

- Requires an NPDES permit; much harder to obtain than a discharge permit to a city sewer. Not all states are authorized by the EPA to grant these permits

3. All other discharges are illegal and you are subject to a maximum fine of \$25,000 per day.

4. Zero discharge, 100% closed loop system

- Even though no discharge, the local permitting authorities may require an abbreviated permitting process, according to Federal Law.



How Do You Start to Find the Recycling System You Need?

1. Evaluate your water recycling needs

- List each piece of fabrication equipment.
- Obtain water quality requirements from each manufacturer.

2. If you plan to discharge legally:

- Contact local permitting authority.
- Obtain and submit appropriate forms.

3. If you choose not to discharge any water:

- Confirm that the recycling system supplier can supply water to meet all the water quality requirements you listed in Step 1.

4. Be careful before you buy.

- This is a serious investment.
- Ask for references and visit operating sites.
- Ask for guarantees.

**If you add too much water;
discharge is inevitable**



Further advantages of 100% water recycling

- No outside oversight required
- No impact on city sewer system
- No impact on city wastewater plant
- Minimal impact on city water plant
 - Only replace water lost to evaporation
- Substantial savings in water and sewer charges



Further advantages of 100% water recycling

- Green – being a good neighbor
- Not affected by water restrictions
- Not affected by municipal
“Discharge Requirements”



