

Defining Problems and Solutions of Wash Water Recovery for Golf Courses

By Roger K. Tychsen

Fresh water is not as plentiful as you'd think today in the United States continuous depletion of our water resources could cause us to be facing a critical water shortage in the near future, according to National Geographic Magazine. In one of their recent articles, we learned some interesting statistics which we thought were worth passing along to you to help you better understand the size and scope of the problem.

It is a fact that the earth has virtually the same amount of fresh water today that it did when dinosaurs roamed the planet five hundred million years ago. Ninety-seven percent of the Earth's water supply is in the form of salt water. Only 3% is fresh, and two-thirds of that is ice. That means there is only 1% remaining as fresh water for our use and half of that is locked up in Lake Baikal in Russia. The big problem is simply that there are too many people, and the fact is that we flagrantly abuse one of our most precious and limited of resources.

In California, for example, 78% of the available water supply goes to agriculture and 22% goes to urban uses. The United States withdraws 339 billion gallons of ground and surface water a day. An average of four trillion gallons of water falls on the US daily in the form of precipitation, but much of that disappears in evaporation and runoff. At the same time our rivers and aquifers are being dangerously fouled and depleted.

"Because it is such a limited resource, it becomes all of our responsibilities to end or limit its' abuse. People's attitudes, habits and perceptions of water must change. Blatant misuse, waste and ignorance of water problems need to be vocalized, and awareness of the challenges which lie ahead need to be brought to public attention"...and we agree whole heartedly.

Storm Water Regulation Impact

The Federal Clean Water Act has been slow to be implemented on a proportionate basis state by state, but it has had an impact in many areas already especially in the business of Power Washing. Businesses which work outside and have waste water which drains onto the ground or into the storm sewer have been the first to be affected including: painters, pool repair, construction workers, paving contractors, saw cut operators, carpet cleaners, golf courses, pesticide applicators and auto repair operations.

For years bare dirt and storm drains on the street have been used as the personal sinks of many owners and operators of power wash equipment who have presumed their waste water would be cleaned up by someone else. In truth

the storm drain system is completely different from the sanitary sewer system. Most storm drains empty directly into the ocean, bay, river, creek or other body of water with no treatment at all, eventually affecting our drinking or irrigation water supply

Local owners and operators involved in equipment washing sales or usage have been participating with government wastewater agencies to help with the development of emerging regulations. The result has been the development of a Best Management Practices (BMPs) guide for the power washing industry. Some of the guidelines are:

Pollutants caused by Power washing jobs are:

- * Soaps, detergents and degreasers
- * Petroleum products including oil and grease
- * Any toxic compounds removed during washing
- * Heavy metals—especially copper, nickel, zinc and silver

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Wash Water Recovery—

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- * Corrosive solutions
- * Bacteria from food or animal waste
- * Sediment, sand, dirt and debris

None of these pollutants can be washed onto the street or into the gutter, storm drain system or any body of water or be allowed to soak into the ground. Waste water containing these pollutants must be captured, collected and ultimately treated. If you eventually discharge the water to the sanitary sewer system you may be required to do some testing or use some pretreatment equipment such as an oil/water separator or a water recycling machine.

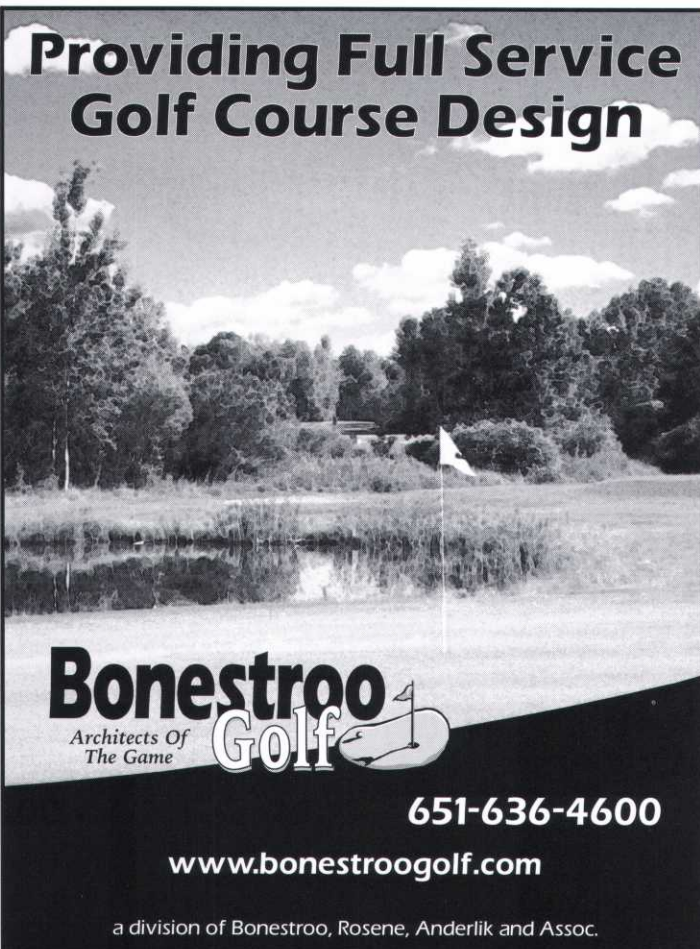
Effects of Pollutants Generated by Equipment Washing

* Oils and Oil Emulsions. Very Low concentrations can interfere with respiration and reproduction in fish and other aquatic life as well as destroy algae and plankton. Oily films on water surfaces can interfere with aeration of the water and block needed sunlight required for photosynthesis.

* Nutrients. Cleaners containing nutrients such as phosphorous and nitrogen cause plant life to increase, which can cause oxygen depletion, causing plants to die and decay and thereby depriving fish of oxygen needed for survival.

* Chlorine. Even very low levels can be lethal to aquatic life.

* Ammonia. High levels can be lethal to fish and other aquatic life. Ammonia contains nitrogen, which causes the results previously listed under nutrients.



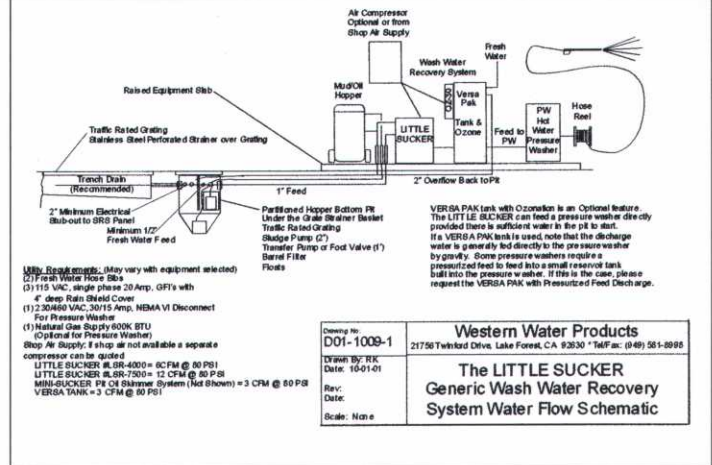
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Simplified System Water Flow Diagram



- * Metals. Cadmium, lead, copper and others can interfere with reproductive cycles of fish, invertebrates and other aquatic life.
- * Sodium Hydroxide. This caustic agent found in some cleaners is toxic to fish and other aquatic life.
- * Phosphoric Acid. Is toxic to aquatic organisms. The nutrient phosphorous also causes the problems listed under nutrients.
- * Potassium Hydroxide and Nitriliacetic Acid. These two agents found in cleaning detergents are harmful to aquatic life.
- * Meta, Para, Ortho-Xylenes. Ingredients found in concentrate cleaners that are harmful to aquatic life in very low concentrations.
- * Hydroflouric Acid. Also toxic to aquatic in very low concentrations.

Liquids from cleaning operations can also cause water to become cloudy and turbid (foul). Turbidity can effect aquatic plant growth by reducing available sunlight. Solids can smother bottom dwelling aquatic organisms.

EPA and Wash Water Issues - Summary

The EPA deals with a variety of environmental issues with their main purpose being to protect the environment. Those issues that are pertinent to the washing industry as a whole are quite simple.

Wash Water is considered a source of Industrial Waste.

If for any reason "wash water" is allowed to soak into the ground, go into a storm drain or drain into any surface water such as a river or a lake, it must meet the "CLEAN WATER ACT'S" contamination requirements, which simply states that it must be as clean as drinking water.

To avoid any conflicts, all the water used needs to be picked up and disposed of properly. Since this is not always practical, then "ZERO DISCHARGE" reclamation is required. This means all the water is picked up, cleaned and reused so as not to pollute any ground or surface waters. Left-over water must be hauled away or cleaned for discharge to local sanitary sewer standards.

Any cleaning, maintenance or other service that does not follow a practice that prevents ground or surface water contamination during its operation is typically in violation of the "CLEAN WATER ACT" and both the owner of the property and the operator could be liable and face legal penalties and be responsible for damages and clean-up costs.

Today, technologies and equipment are available to enable the cleaning industry to be compliant. It is, therefore, in the best interest of the industry at large and in the interest of public health and safety to work towards the goal of 100% compliance.

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Wash Water Recovery—

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To this goal, operators utilizing equipment in the washing process which clean and reuse wash water and/or pick up wash water and remove it from the site or process it to meet sanitary sewer discharge requirements are typically compliant in that they are utilizing "best management practices" to control contamination to ground and surface water. Those, who utilize these "best management practices", limit their own and their clients' exposure and risk of running afoul of EPA regulations relating to this matter.

EPA and Industrial Waste - Detail

Why does the US EPA regulate the discharge of industrial wastewaters?

The Threat to Public Health & Environment: Many businesses generate waste and wastewater during daily operations. If these wastewaters are disposed of into shallow injection wells, such as septic drain fields, dry wells, cesspools or pits, constituents from these wastewaters pass through septic systems and discharge to ground water unchanged.

If these wastewaters are disposed into storm drains or sewers, they may endanger surface water such as streams, lakes and estuaries.

The Safe Drinking Water Act

EPA and State Underground Injection Control (UIC) programs are established to protect underground sources of drinking water from contamination by injection wells.

EPA has found that contaminant concentrations in ground-water resulting from industrial discharges may exceed the maximum contaminant levels (MCL's) identified in the EPA primary drinking water standards. EPA prohibits the injection or run-off of fluids that will endanger ground water that is or could be and underground source of drinking water.

The Clean Water Act

EPA prohibits the discharge of wastewater into storm drains or sewers under the authority of the Clean Water Act.

The Resource Conservation Recovery Act (RCRA): EPA has recently added 20 new chemicals to the list defining toxic waste (March 29, 1990). Industrial wastewaters contain many of these toxic chemicals.

If you discharge RCRA-regulated wastes into a septic system, drain field, drywell, cesspool, pit or other injection well, you may be operating an unauthorized, hazardous, waste disposal site.

Solutions:

You must stop discharging industrial wastes to your septic system, drain fields, dry wells, cesspools, pits or separate storm drains or sewers.

Stop using the well for these wastes!

Facilities that use these types of disposal systems may be in violation of federal, state or local requirements and subject to monetary penalties.

First: Temporarily seal the floor drains or other means of wastewater entry to the injection wells and surface waters. If the floor drains are necessary to comply with state or local laws, the discharge point to the injection well should be blocked or disconnected. You should then use one of the following plans for alternate disposal:

Eliminate the wastewater, if possible, through recycling, improved housekeeping, waste minimization or other means.

Route all wastewater to a municipal wastewater treatment facility, if available, and if it will accept your waste.

If a municipal treatment plant is not available, or it will not accept your waste, route the waste to a tank or container for proper accumulation and disposal.

Second: Initiate a waste minimization and pollution prevention program. Even if you cannot eliminate the waste entirely, you may be able to reduce the volume and toxicity. This may reduce your costs, liabilities and the regulatory burden of hazardous waste management, while preserving the environment and precious ground-water resources.

Minimize wastes by recycling wherever and whenever possible.

Third: Implement clean-up. In many states you will need to contact the appropriate EPA, state and local agencies regarding their closure and permit requirements.

In most instances, you will need to:

Pressure wash any discharge lines or piping leading to the septic system, cesspool or drywell.

Clean out liquids and solids from all lines and tanks, dry wells or pits. Dispose of the contents by acceptable methods for waste disposal.

Fill the dry well, cesspool or pit with an inert material, seal with asphalt or cement, or as otherwise required by state and local authorities.

In the future use implement a water conservation program by using wash water recovery equipment designed to save precious water and clean up the water you are using for reuse in your application.

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New Golf Course Water Recovery System Concentrates on Getting the Grass Out –

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As a contributor of this article, Western Water Products, Lake Forest, CA, announces the introduction of a new water recovery system designed specifically for golf course applications...The LITTLE SUCKER Wash Water Recovery System.

In the real world, golf courses pose a particularly difficult problem for wash water recovery applications due to high amounts of dirt and grass clippings. Grass clippings, if not removed, create conditions allowing organic fermentation to occur. Also, green algae and other micro-organisms will bloom out of control. If not removed, grass clippings can cause severe odor problems and damage high pressure wash equipment.

With the addition of a Grass Catcher Filtration Tank to its' already successful LITTLE SUCKER wash water recovery system, Western Water Products has created a system which eliminates the majority of grass clippings from the water with a unique easily cleanable series of filter-strainer baskets.

In a typical application, Western Water Products recommends the wash pad be designed to include a trench drain, sand trap and/or single hopper bottom pit. The Hopper Bottom Pit is a unique design offered only by Western Water Products and when combined with their exclusive Independent Sludge Removal System pulls additional grass and dirt from the pit and deposits it

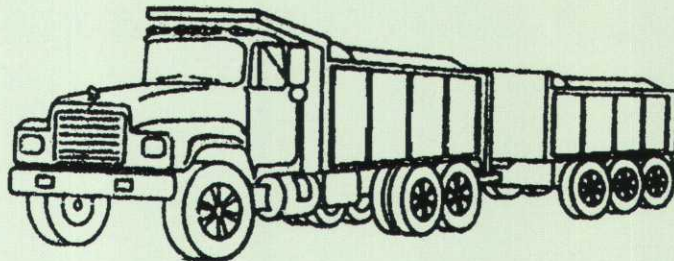
in an easy to clean Above Ground Mud Hopper. Also, with the introduction of this new Golf Course Water Recovery System, Western Water Products also announces the introduction of a pre-formed Hopper Bottom Pit and Grate design which can be located in the center of the wash pad or off to the side. The pit is large enough to accommodate both a Transfer Pump and a Heavy-Duty Sludge Removal Pump.

The **LITTLE SUCKER** utilizes 14 proven water recovery technologies, and with the addition of a newly designed Double Redundant Grass Strainer System, the LITTLE SUCKER is able to overcome the major problem in golf course applications of eliminating grass from the waste water. Elimination of grass has been a major problem in the past with other systems, because it was so difficult to remove and created a breeding ground for algae and other odor causing organisms. The secret to Western Water Products success is two fold.

1) Western Water Products utilizes an exclusive pit "Sludge Removal System" and has developed a unique hopper bottom pit design to promote the collection of sludge at a central point for easy removal.

2) Western Water Products has also developed a "Double Redundant" Grass Strainer Technology incorporating two grass strainers in the pit and two in an above ground "Grass Catcher Tank" and positioned them all in series for maximum grass removal.

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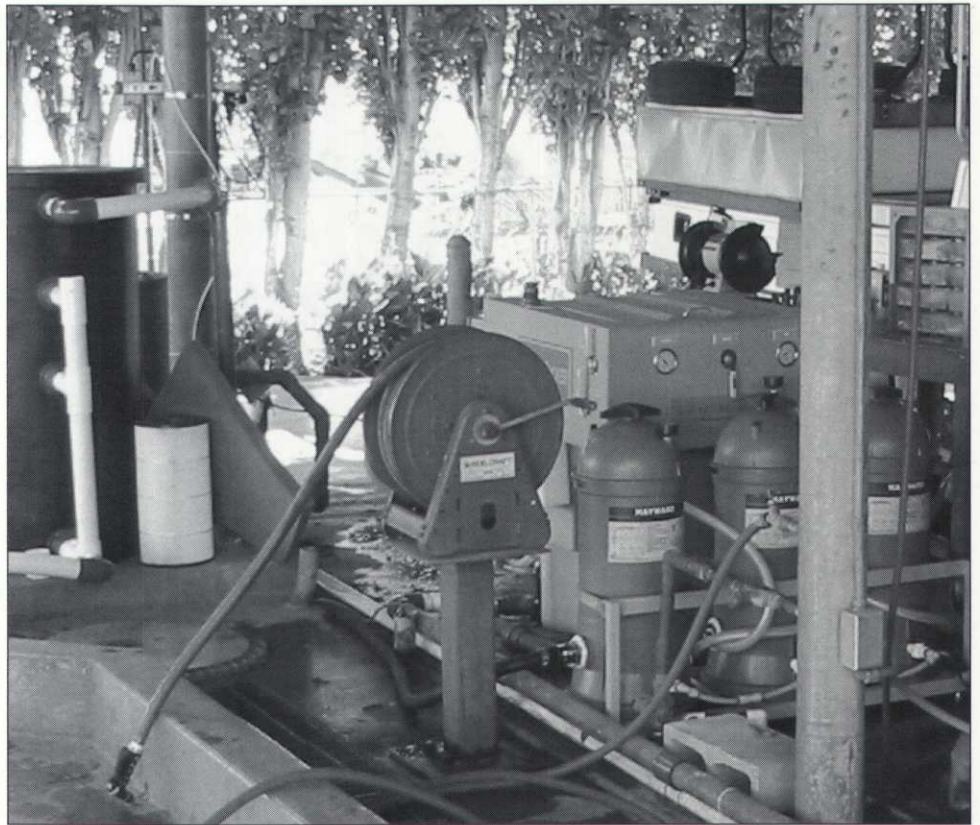
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Kapolei Golf Course, Hawaii: The LITTLE SUCKER Wash Water Recovery System with Grass Catcher (right).

The result is that the complete system is easier to operate, provides cleaner wash water without a major odor problem, and maintenance has been limited to an average of 1 hour a week. These systems are easy to install, easy to operate and easy to maintain. They take up less space, come ready to assemble and the complete Golf Course System is competitively priced below the competition's partial system.

(Editor's Note: For more information in reference to this article by Roger K. Tychsen, please contact Western Water Products 949-581-8998.)

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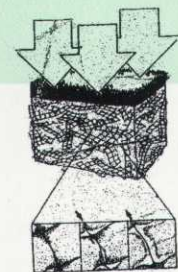
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