

PROCEDURES FOR THE PROPER DISCHARGE OF WATER FROM SWIMMING POOLS

BACKGROUND ON SWIMMING POOL OPERATIONS

Many swimming pool facilities operate with chemical addition and filtration to maintain a closed-recirculating system. Chemicals are added for disinfection and control of pH, alkalinity, and hardness. Sanitizers are added to kill and control disease-carrying bacteria, algae and dirt. The most common sanitizers are chlorine and chlorine compounds (trichloroisocyanuric acid, calcium hypochlorite, sodium dichloroisocyanurate, sodium dichloroisocyanurate dihydrate, lithium hypochlorite, and sodium hypochlorite). Other sanitizing agents may include 1,3-dichlorohydantoin, 1,3-dichloro-5,5-dimethylhydantoin, 3-chloro-4,4-dimethyl-2-oxazolidinone and 1-chloro-3-bromo-5,5-dimethylhydantoin. Upon addition these algaecides float. To get the most effective use of the chemicals added, standard operating procedures would call for complete mixing (i.e., approximately 24 hours) prior to backwash of the filter.

The control of pH in the range of 7.2 - 7.6 is necessary for swimmer comfort and optimal effectiveness of chlorine. Hydrochloric acid or sodium bisulfate is added to lower pH and sodium carbonate is added to raise it. A balance between pH, alkalinity and hardness must be maintained to control corrosion and scaling. Sodium bicarbonate is generally added to increase alkalinity and muriatic (hydrochloric) acid or sodium bisulfate to reduce it. Hardness is raised with calcium chloride and lowered by draining out pool water and replacing with lower hardness makeup water. A facility may pass pool water through a softener or demineralize to reduce hardness.

Pool water needs to be continuously filtered for removal of organic and inorganic suspended solids which would otherwise cloud water and interfere with disinfection. Since pool water is commonly used for backwash, the filter backwash also usually provides for blowdown of hardness, perspiration, body oils, lotions, nitrogen compounds (chloramines) and other dissolved solids as the pool water is replaced with fresh water. The wastewater discharges from swimming pool type facilities include pool cleaning, filter backwash, and pool drainage.

A. Pool Cleaning

Extensive pool cleaning may take place at the beginning of the season. Highly concentrated muriatic (hydrochloric) acid may be used for cleaning. The chemicals disperse in the volume of water remaining in the pool prior to drainage. It is anticipated that discharge will have a pH between 6 and 9.

Minor pool cleaning with muriatic acid also takes place throughout the year. This is the same acid used for pH adjustment and the acid for pool cleaning is just calculated into the total amount necessary for proper pool pH adjustment.

B. Filter Backwash

Filter systems include granular media filters (sand or anthracite filters) and fabric filters (paper or cloth cartridge filters and precoat diatomaceous earth filters). Backwash of sand filters will result in the discharge of an initial high concentration of solids. Backwash of diatomaceous earth filters will result in the discharge of the same types of solids as from sand filters plus the precoat diatomaceous earth added

to the filter fabric. Cloth cartridge filters are manually cleaned by rinsing in water and paper cartridges can be cleaned or simply disposed of. Since pool water is commonly used for backwash, the filter backwash water will usually contain chlorine at a concentration equivalent to the level maintained in the pool (a minimum of 1 to 1.5 mg/l free available chlorine).

C. Pool Drainage

Pool drainage typically occurs when maintenance must be done on the pool.

REQUIREMENTS FOR SANITARY SEWER DISCHARGES

All discharges to the sanitary sewer of swimming pool filter backwash, pool cleaning water, or pool draining water shall first be approved by the local wastewater agency having jurisdiction in the area.

The following policy applies within the areas served by the Monterey Regional Water Pollution Control Agency (MRWPCA), the regional wastewater agency in much of the area covered by this MRSWMP:

Swimming pool discharges to the sanitary sewer are acceptable without any pretreatment. The discharge piping needs to either be hard plumbed to a drain on site, or a hose discharging to a drain on site can be used. No hoses discharging to a manhole in the street are allowed. Backwash water from pool filter systems may also be discharged to the sanitary sewer, but the discharge cannot contain any carbon, clay or diatomaceous earth. Before discharging pool or backwash water, the pool operator should contact MRWPCA's Customer Service Department to check on any billing requirements, and with the City's Public Works Department to determine the maximum allowable flow rate of the sanitary sewer line they will be discharging into, so the discharge does not cause surcharging or potential overflow of the sewer line.

Before discharging to a sanitary sewer outside of the MRWPCA service area, the local wastewater agency should be consulted.

REQUIREMENTS FOR SURFACE WATER DISCHARGES

Surface water discharges include ditches, storm sewers and pipes that convey wastewater to creeks, streams, rivers, lakes and the ocean. To protect the aquatic environment of the receiving water, these disinfectant concentrations must be minimized prior to discharge to meet effluent limitations. The following are acceptable minimization methods:

Natural Dissipation - For pool drainage, discontinuing chlorination and allowing the active chlorine to dissipate through aeration by having the pool water sit for three days prior to drainage should be sufficient in most cases. The water should be tested to verify that the chlorine level has been sufficiently reduced before beginning the discharge. Testing for residual chlorine should be performed every half-hour during the discharge event to confirm that chlorine reduction has been achieved. If chlorine levels above those listed below are detected, the discharge should be halted and the water allowed to sit for an additional time period until sufficient reduction has been achieved, and the discharge can be resumed.

Chemical Reduction - A treatment system consisting of a holding tank and chemical addition may be necessary for the elimination of chlorine in the filter backwash water and other highly chlorinated discharges.

Where the discharge of pool water to the sanitary sewer is not feasible, federal law allows the release of dechlorinated swimming pool water. Compliance with these requirements can be determined by using a pool testing kit. In general, the guidelines for such releases require pool owners to ensure that all the following criteria are met:

- The residual chlorine does not exceed 0.1 mg/l (parts per million);
- The pH is between 6.5 and 8.5;
- The water is free of any unusual coloration;
- There is no discharge of filter media;
- There is no discharge of acid cleaning wastes.

The table below provides a guide to the amount of chemical that will need to be added to achieve the required level of chlorine residual reduction.

The discharge of filter backwash water to a storm drain system or any type of surface discharge is not allowable.

Neutralization Chemical	Chlorine Concentration Before Neutralization			
	1.0 mg/l	2.0 mg/l	10.0 mg/l	50.0 mg/l
Sulfur Dioxide (SO ₂)	0.8 lbs	1.7 lbs	8.3 lbs	41.7 lbs
Sodium Bisulfite (NaHSO ₃)	1.2 lbs	2.5 lbs	12.5 lbs	62.6 lbs
Sodium Sulfite (Na ₂ SO ₃)	1.4 lbs	2.9 lbs	14.6 lbs	73.0 lbs
Sodium Thiosulfate (Na ₂ S ₂ O ₃ ·5H ₂ O)	1.2 lbs	2.4 lbs	12.0 lbs	60.0 lbs

Source: Santa Clara Valley Water District. Water Utility O&M Pollution Prevention Plan