MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard Baltimore Maryland 21230
(410) 537-3000 1-800-633-6101 http://www.mde.state.md.us

FACT SHEET

General Discharge Permit No. 12-SI
NPDES Permit No. MDG76
Discharges from Swimming Pools & Spas

Background

General permits are discharge permits issued for classes of discharges which are the result of particular operations or treatment processes with similar effluent characteristics. The permit provides effluent limitations and conditions that the discharges must meet, and is subject to the same compliance responsibilities as individual discharge permits. The Maryland Department of the Environment (Department) improves the efficiency of its National Pollution Discharge Elimination System (NPDES) Permit Program by issuing general permits to cover similar types of discharges and, at the same time, provides a service to the regulated community by reducing the time necessary to obtain a permit.

This general permit addresses a variety of discharges from swimming pools and spas, including baptismal fonts. Both federal (U.S. Environmental Protection Agency (EPA) Regulations at 40 CFR Part 122) and state (COMAR 26.08.04) regulations require discharge permits for most of these facilities. Specifically, state regulations require that all discharges of wastes or wastewater regardless of volume shall be authorized by a discharge permit. This includes discharges to surface or ground waters. Federal regulations address discharges to surface waters only.

The Department is revising this permit to clarify eligible discharges based on inquiries since the last permit was issued. The proposed permit requires monitoring of turbidity for discharges associated with back wash water. It also requires a site map be submitted with the notice of intent for coverage which catalogues the discharge locations associated with this permit at the facility along with the wastewater sampling location. Changes included within this proposed permit are clarified below.

Facilities subject to this permit
This permit covers any public or private pool or spa including baptismal fonts. Owners operating private pools or spas are not subject to monitoring and reporting requirements, but are subject to meeting the discharge limits of the permit. Pools or spas discharging to sanitary sewer are not subject to this permit. Private pools or spas are not subject to registration or fees.

Eligible Discharges
This permit authorizes discharges of overflow, drainage (drawdown), filter backwash, and cleaning water from any public or private pool or spa including baptismal fonts. The wastewater may contain chlorine, algaecides, Poly(hexamethylenebiguanide hydrochloride)-related disinfectants (PHMB), other disinfectants, variable pH, and solids.

This permit sets numerical limits on the concentration of the above-mentioned pollutants of concern. The limits are based on what has been demonstrated to be technologically achievable and adequate to protect water quality. This permit contains operational requirements, such as inspection routines and erosion prevention. This permit limits these parameters both directly and indirectly, i.e. by establishing end-of-pipe numerical limits and by requiring operational

measures to prevent the generation of pollutants or their entrainment in the discharge. If there are other significant pollutants likely to be discharged from a facility, then the Department may require an individual permit for that facility. New facilities may not be eligible for coverage under this permit if they discharge to a stream(s) on the state's 303(d) list, or to a stream(s) for which a Total Maximum Daily Load(s) (TMDL) has been established. Additionally this permit includes a narrative condition prohibiting the discharge of floating solids or persistent foam other than trace amounts.

This permit does not include nutrient monitoring requirements as this industry, in the state of Maryland, as it is not considered as a significant point source discharger of nutrients in the Bay tributary strategy.

Origins of the numerical limits

Maryland permits include limits based on protection of water quality standards and available technology. Because a general permit applies to facilities in many parts of the state, it must reflect the most stringent conditions necessary to protect water quality.

Water quality-based limits are derived from water quality criteria, which the Department establishes in its regulations, COMAR 26.08.02 (*http://www.dsd.state.md.us/comar/*). Water quality criteria describe the physical and chemical conditions to support water contact recreation, fishing, aquatic life, wildlife, use as public water supply, and consumption of fish and shellfish.

The chlorine, copper, and silver limits are water quality based effluent limits. These limits are based on water quality criteria found in COMAR 26.08.02.03.

Since the EPA has not established effluent limitation guidelines for facilities identified as being covered by this permit, the remaining parameters in this permit are based on technology based limits and are derived from the Department's best professional judgment (BPJ).

The bromine limit is a technology based limit and its origin is explained below. All other limits in this permit are based on best professional judgment (BPJ) as described below.

Discharge specific limits

A. Solids: All solids shall not exceed a particle size that can pass Tyler designation mesh-20 - meaning all solids shall be no greater than 0.0331-inches in size. An easy way to achieve this narrative limit is to discharge all authorized discharges through a Tyler size #20 mesh screen. Based on the Departments research, wastes from this category of discharges are typically from the users of the pools, mud and fine bits of grass. While some of these materials originate from State waters, these materials did not originate from the area around the outfall and can have a detrimental effect, including oxygen depletion and deposition. Also the Clean Water Act requires all dischargers to remove the maximum amount of pollutant practicable, regardless of impact. The Tyler mesh screen will decrease particle size to only fine particles.

B. Copper, Silver: The disinfectants and algaecides are toxic to aquatic life, so are limited at low levels. Some of these materials, such as copper and silver, can also cause aesthetic problems in drinking water so they are also regulated when discharged to ground water. The surface water discharge limits are based on the water quality criteria for acute aquatic toxicity in fresh and salt water; silver (3.2 and 1.9 ug/L) and copper (13 and 4.8 ug/L) respectively.

C. Total Residual Chlorine: Facilities must maintain a balance how chlorine is added to protect the facility users from bacteria and to protect the facility users from the cleaning solution. The parameter is “total residual”, because chlorine may be present either as free chlorine or as an organic compound, such as trihalomethane; both are toxic to aquatic life.

A chlorine molecule or ion kills bacteria, algae, and disease-causing organisms by moving through the cell membranes and deactivating the cell's essential enzymes and structures. All chemical forms of chlorine provide oxidation, but different forms vary in effectiveness depending on how easily they move through the cell membranes.

The limits are based on the water quality criteria for acute aquatic toxicity in fresh (19ug/L) and salt water (13 ug/L). Though these are water quality criteria, in more cases than not, the operator cannot meet or demonstrate compliance with the mixing zone requirements of COMAR 26.08.02.05.C. Compliance for results less than 0.1 mg/L is specified in COMAR 26.08.03.06.D and produces the most meaningful results. While field testing technology is less precise, the immediacy of sample analysis increases accuracy. Laboratory technology is more precise, but less accurate due to the volatility of the pollutant potentially degrading the sample quality prior to laboratory analysis.

D. Total Residual Bromine: Bromine is primarily used in spas but can be used in swimming pools also. Bromine tends to cause a brown staining on the spa surfaces and fittings and is difficult to remove. Bromine, like chlorine, is a chemical element of the halogen family and is a prominent pool or spa disinfecting agent. Bromine compounds used for pool or spa disinfection are manufactured in granular, liquid, and tablet form. Elemental bromine is a liquid, and is rarely used today to disinfect pools or spas. The advantages of bromine include a more stable level of disinfecting power at higher water temperatures, and less objectionable smell. Since all three forms of bromine - hypobromous acid, hypobromite ions, and bromamines - are active disinfectants, the Total Bromine Residual reading is an accurate measure of the amount of active disinfectant. There is no need to measure the total *and* combined levels to determine the free bromine level, as for chlorine.

Bromine has a pH of 4.0-4.5. When bromine is added to water and an oxidizer is present, the bromine forms hypobromous acid (HOBR) and bypobromite ions (OBr). Like chlorine, the percentage of each is affected by pH. However, the effect is not as dramatic as it is with chlorine. Like chlorine, bromine combines with organic impurities to form combined bromine or bromamines. However, combined bromine is still an effective sanitizer, and it does not smell. Because of this, bromine is popular for spas.

The limit identified in the permit (100 ug/L) reflects a technology based limit as the sampling method for Total Residual Bromine minimum detection level is 0.1 mg/L. Although the permit limits total residual chlorine reflecting aquatic toxicity limits, it is understood the sampling method detects to a minimum value of 0.1 mg/L thus the footnote in the permit notes that compliance requires identifying a limit less than 0.1 mg/L. Hence, the total residual bromine limit is expressed in being less than 0.1 mg/L as it is the minimum detection level.

E. pH: Chemical compounds used to dechlorinate depress pH if used in excess. The pH range may also be influenced by the water source. It may be raised if concrete is involved in cleaning. pH is regulated for cleaning discharges because acid is routinely used in this process. The discharge of acidic wastewater to surface waters can kill aquatic life, and discharges to ground water can damage the potability of the water supply. Because of the

natural buffering capacity of the receiving waters, the Department chose to apply technology limits (6.0 to 9.0 standard units) only on the assumption that there would be enough buffering capacity in any receiving water to accommodate the slight difference between this range and the water quality standard of 6.5 to 8.5. The technology range is typically used in effluent limitation guidelines and has always been used by the Department, in lieu of guidelines, as a best professional judgment limit.

F. Turbidity: This permit limits discharges from backwashing and cleaning to 150 NTU's as a daily maximum. The numeric limit is the maximum value for water quality protection in accordance with water quality criteria established in COMAR 26.08.02.03-3. Turbidity is a measure of water clarity; how much the material suspended in water decreases the passage of light through the water. Turbidity can affect the color of the water. Higher turbidity increases water temperatures because suspended particles absorb more heat. This in turn reduces the concentration of dissolved oxygen (DO) because warm water holds less DO than cold. Higher turbidity also reduces the amount of light penetrating the water, which reduces photosynthesis and the production of DO. Suspended materials can clog fish gills, reducing resistance to disease in fish, lowering growth rates, and affecting egg and larval development. As the particles settle, they can blanket the stream bottom, especially in slower waters, and smother fish eggs and benthic macroinvertebrates. Sources of turbidity include: soil erosion, waste discharge, eroding stream banks, and excessive algal growth. Turbidity is measured in units of NTU's.

What are NTU's? The term Nephelometric refers to the way the instrument estimates how light is scattered by suspended particulate material in the water. The Nephelometer, also called a turbidimeter, attached to the RUSS unit has the photocell (similar to the one on your camera or your bathroom nightlight) set at 90 degrees to the direction of the light beam to estimate scattered rather than absorbed light. This measurement generally provides a very good correlation with the concentration of particles in the water that affect clarity.

G. Cyanuric Acid: The Department limits authorized discharges in this permit to surface waters of the state by setting a daily maximum limit of 100 mg/L. Cyanuric acid forms a weak bond with free chlorine in the pool water, protecting it from the sun’s ultraviolet rays to reduce chlorine loss. Properly managed, cyanuric acid has been shown to reduce the amount of chlorine needed to maintain the minimum chlorine residual in an outdoor pool. In a small pool with a moderate bather load, cyanuric acid can significantly reduce the cost for chemical disinfection. The limits are based on best professional judgment. In the past, the Department had made a conclusion based on the amount thought to be necessary for use in pools. The Department is has modified its rationale based on COMAR 10.17.01.44 which limits cyanuric acid to be maintained between 30 and 100ppm. According to research, at above 50 ppm cyanuric acid, the time it takes to kill bacteria in the water is longer compared to pool water without cyanuric acid. As the level of cyanuric acid builds up, the chlorine will become increasingly less effective in keeping the water clean and problems such as increased cloudiness and exceeding combined chlorine limits can occur.

The main method used to determine compliance with a discharge permit is for permittees to submit monitoring results of their discharge. The results are to be submitted on a Discharge Monitoring Report (DMR) as provided by the Department with registration under this permit. The samples and measurement must be taken at such a time to be representative of the quantity and quality of the discharge during the specified monitoring periods. These samples must be analyzed in accordance with 40 CFR 136. The permit requires quarterly submission of DMRs. Permittees must submit the name and address of the laboratory performing analyses

within 30 days of registration under this permit. If the permittee changes laboratories during the permit term, the Department shall be notified within 30 days in writing.

Additional Permit Requirements

Site Map
The Department requires a site map to be submitted with an application. The map must identify the locations of all discharge points, any significant structures, as well as any surface waters within a quarter-mile of the discharge location. The map must also provide the sampling point of the wastewater. In all cases, the discharge locations shall correspond to those identified on the application.

Algaecides
Algaecides are typically used in pool operations to control and prevent algae outbreaks. If proper pH and free chlorine are not maintained, it is very likely algae will occur. This permit limits the use of algaecides to those with the active ingredient of chlorine, copper or silver, only. If the label on the algaecide contains a warning against discharging water treated with the algaecide into lakes, streams, ponds, or other water bodies, the **algaecide may not be used**.

Monitoring & Record Log
Owners operating private pools or spas are not subject to the monitoring and reporting requirements but must ensure all limits in the permit are met. Monitoring is to be performed and compliant with the numeric and narrative limits of the permit prior to the discharge. For each measurement or sample taken, the permittee must maintain a record log. The record log must include the place, date and time of sample, person performing the measurement, date and time the sample was analyzed, technique used (for all but flow, parameters are to be analyzed using those techniques identified in 40 CFR 136), and the results of the analysis.

Additional Changes to Permit Language

In addition to the changes identified above, the Department has made updates to various standard permit conditions. The updated standard permit conditions include, but are not limited to: requirements to obtain coverage under an individual permit, as necessary; termination of coverage under a permit; continuation of an expired general permit; the definitions for super chlorination, potable water, disinfectant, estimated flow, impaired water, and total maximum daily load (TMDL); notice of intent (application) requirements; submission of notifications once registered under the permit; reporting of laboratory performing analysis; facility operation and maintenance; permit modification; and Civil Penalties for Violations of Permit Conditions.

Also modified in this permit are the requirements for transfer of authorization under this permit from ‘non-transferable to a person’ to ‘non-transferable to a change in location’. This ensures the Department is not authorizing a discharge at a new location without appropriate review through submission of a new application.

Obtaining Registration under this Permit

Application
Applications (NOI) must be completed in full, include a site map, photo copy of algaecide label (if used), and the appropriate fee. Application fees in COMAR are unchanged at this time from the previous permit at $100 per application.

Registration

Upon review and approval of the required items identified above, the Department will provide a letter identifying the registration number and include a copy of the Discharge Monitoring Report (DMR) for use, as applicable.

Owners of private pools and spas, including baptismal fonts

Owners of private pools and spas, including baptismal fonts, are authorized by the permit to discharge wastewater but are not required to register for the permit or monitor the wastewater. Persons responsible for these facilities are advised to reduce the impact of wastewater from their facilities through the following measures.

- Minimize discharges of water from pool draining by maintaining pool filtration system.
- Minimize discharges of water from pool cleaning by covering pools when not in use;
- Do not drain or lower water level in pool until disinfectant levels are nondetectable, by allowing the chlorine to dissipate over a few days.
- If the pool is shock treated, do not backwash or otherwise discharge water until the level of chlorine or other disinfectant has returned to normal. Sodium thiosulfate or sodium metabisulfite can reduce chlorine levels quickly.
- Make sure water used to acid wash pool is neutralized prior to discharge. Soda ash can be used to keep the pH between 6.0 and 9.0 before discharging.
- Confine backwash water discharges to the ground, on your property, if possible. Well vegetated or wooded areas are best.
- Drain pools slowly, using a low volume pump or siphon.