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## **Guidelines for Managing Water Quality for Cooling Towers, Swimming Pools and Water Fountains During the Period of Heightened Safe Distancing Measures**

This set of guidelines provides guidance on managing water quality in water features regulated by the National Environment Agency (NEA) during the ongoing COVID-19 situation where tighter safe distancing rules apply and activities are restricted as announced on 3 April 2020.

**During such a situation of heightened safe distancing measures, all swimming pools, aerosol-generating features of water fountains and cooling towers shall be closed. Only cooling towers serving essential services are allowed to operate. Laboratory tests are not required during this period from 7 April to 1 June 2020 (inclusive) for all regulated water features, including cooling towers serving essential services.**

**All companies involved in the maintenance of swimming pools, water fountains and cooling towers are required to submit applications to obtain approval from the Ministry of Trade and Industry (MTI) before they are allowed to continue to operate. One of the conditions for approvals by MTI is to comply with the advisories issued by various relevant authorities.**

**From 7 April to 2020 1 June 2020 (inclusive), all such companies that are approved to operate shall adhere to the maximum manpower of 2 staff deployed per site at a frequency of once every 2 weeks when they carry out maintenance of regulated water features, failing which, approvals to continue to operate may be rescinded.**

Maintenance contractors are to keep a record for all urgent essential repairs during this period and this must be acknowledged by their clients to facilitate contact tracing purposes.

Maintenance contractors should ensure that they have sufficient stock of water treatment chemicals to tide over this period.

## **1. Cooling Towers\* (CTs)**

### **1.1 CTs in operation during the period of heightened safe distancing measures**

1.1.1 A maximum of 2 maintenance personnel are allowed to visit the site once every 2 weeks to conduct necessary maintenance work (e.g. bleed off, cleaning, checking of dosing system, etc) and replenish the chemicals for both auto and manual dosing systems.

1.1.2 Maintenance contractors shall ensure that the water treatment chemicals can last for at least 2 weeks and the treatment programme is able to keep *Legionella* at bay.

1.1.3 Premises owners/occupiers shall ensure that adequate water treatment is carried out to prevent the risk of acquiring *Legionellosis* at all times.

### **1.2 CTs closed during the period of heightened safe distancing measures**

1.2.1 Premises owners/occupiers shall drain all closed CTs of any water and keep these CTs dry.

### **1.3 Procedures of cleaning and testing before re-starting CTs**

1.3.1 For CTs that have not been in use for more than 5 consecutive days, premises owners/occupiers shall thoroughly clean and disinfect these CTs before re-starting.

*(Refer to Code of Practice for The Control of Legionella Bacteria in Cooling Towers for guidance.)*

1.3.2 Water samples taken from the CTs shall pass the regulated limit of Standard Plate Counts stipulated in the Environmental Public Health (Cooling Towers and Water Fountains) Regulations before the CTs are allowed to be re-started.

*\*Untreated CTs (> 5 consecutive days) could pose a risk of Legionellosis which could compromise public health.*

## **2. Water Fountains (WFs)**

### **2.1 WFs closed during the period of heightened safe distancing measures**

2.1.1 Premises owners/occupiers shall switch off the fountain pumps of all WFs (closing of WFs) to cease generation of aerosols.

2.1.2 Except for WFs with auto-dosing pumps and large WFs where draining of water will damage the structure of WFs, premises owners/occupiers shall drain all closed WFs of any water and keep these WFs dry. After which, premises owners/occupiers shall remove any stagnant water formed (e.g. puddles of rain water), dose chlorine tablets to minimise algae growth or engage a Pest Control Operator (PCO) to do larviciding to prevent mosquito breeding.

2.1.3. For the above-mentioned types of WFs which do not require draining of water, maintenance contractors shall take the following steps to prepare for WF closure:

- a. Switch off all pumps
- b. Brush all surfaces of WF to remove as much algae as possible
- c. Remove all debris from WF
- d. If sand filter is used, perform thorough backwash and rinse sand filtration system
- e. Super-chlorinate the water by raising the free chlorine concentration to 10 mg/L for 24 hours to manage algae growth (Pool Water Treatment Advisory Group (PWTAG), UK)
- f. To minimise algae growth and prevent mosquito breeding, maintenance contractor may wish to prepare pre-packed chlorine tablets for premises owners/occupiers to dose intermittently and, if possible, turn on the dosing pump to ensure that the chlorine is properly distributed throughout the WF system.

2.1.4 A maximum of 2 maintenance personnel are allowed to visit the site once every 2 weeks to conduct necessary maintenance work (e.g. water treatment, scrubbing, vacuuming and cleaning of feature surfaces, clearing of strainers, cleaning/backwashing of filters, etc) and replenish the chemicals for both auto and manual dosing systems.

2.1.5 For fish ponds with aerosol-generating features (WFs containing fishes), sections 2.1.2 and 2.1.3 do not apply. Aerators and other pumps (e.g. filtration pumps, treatment pumps), except fountain pumps, are allowed to continue to operate.

2.1.6 This set of guidelines does not apply to fish ponds without aerosol-generating features. Premises owners/occupiers may wish to consult the National Parks Board (NParks) for advice on any requirements or guidelines for such water features during this period of heightened safe distancing measures.

### **2.2 Procedures of cleaning and testing before re-starting WFs**

2.2.1 For WFs that have not been in use for more than 5 consecutive days, premises owners/occupiers shall thoroughly clean and disinfect WFs before re-starting.

2.2.2 Water samples taken from the WFs shall pass the regulated limit of Standard Plate Counts stipulated in the Environmental Public Health (Cooling Towers and Water Fountains) Regulations before the WFs are allowed to be restarted.

### **3. Swimming Pools (SPs)**

Algae will bloom in SPs if nutrients are present and the residual chlorine level is low or negligible. This may happen to untreated closed pools. Large quantities of chlorine-based chemicals are required to kill algae and destroy odours. It may require multiple times of backwash to remove algae. If the sand filter is infested with algae, it may require a replacement.

In addition to algae growth in the pools, closed pools may pose a risk as breeding grounds for mosquitoes.

Prior to the closure of SPs, premises owners/occupiers shall ensure that treatment is carried out to minimise microbial amplification and prevent damage to the filtration system and pump.

#### **3.1 Steps to prepare for pool closure**

- 3.1.1 Maintenance contractors shall take the following steps to prepare for pool closure:
- a. Close the pool
  - b. Brush all surfaces of pool to remove as much algae as possible
  - c. Vacuum the pool to remove all debris
  - d. Clear wastes from all strainers
  - e. Perform thorough backwash and rinse filtration system
  - f. Super-chlorinate the pool water by raising the free chlorine concentration to 10 mg/L for 24 hours to manage algae growth (Pool Water Treatment Advisory Group (PWTAG), UK)
  - g. Add calcium hypochlorite/sodium hypochlorite to tap water in the bucket until fully dissolved and dispense evenly throughout the pool. Continue to agitate the container to ensure the solution mixes well while dispensing. Failure to dilute properly and spread evenly can result in the precipitation of scales.
  - h. Super-chlorination will raise pH, so acid will be needed to be added to reduce the pH value to 7.5 or less.
  - i. Ensure filtration system is operating. Test for chlorine level to ensure 10 mg/L is achieved during super-chlorination.

#### **3.2 Procedures during pool closure**

3.2.1 A maximum of 2 maintenance personnel are allowed to visit the site once every 2 weeks to conduct necessary maintenance (e.g. water treatment, scrubbing, vacuuming and cleaning of pool surfaces, clearing of strainers, cleaning/backwashing of filters, etc) and replenish the chemicals for both auto and manual dosing systems. The pool shall be dosed with 5-10 mg/L of chlorine every two weeks during this period. Maintenance contractors are to operate the pump to circulate and distribute chlorine throughout the pool for 2 to 6 hours, depending on the turnover rate.

3.2.2 To minimise algae growth and prevent mosquito breeding, maintenance contractor may wish to prepare pre-packed chlorine tablets for premises owners/occupiers to dose intermittently and if possible, turn on the dosing pump to ensure that the chlorine is properly distributed throughout the SP system.

### **3.3 Steps to remove algae in SPs before re-opening SPs**

3.3.1 Premises owners/occupiers shall brush all surfaces of SP to remove as much algae as possible.

3.3.2 Maintenance contractors shall re-start the pool filtration system and proceed to super-chlorinate the pool with 10 mg/L of chlorine for 24 hours to kill the algae. The pool filtration system should continue to run for 24 hours a day.

3.3.3 If the condition of the SP does not significantly improve after 24 hours of filtration, maintenance contractors shall repeat this process until the algae has been eliminated.

3.3.4 Once the algae are dead, it will turn to white greyish colour, and suspend in the pool water or settle down on the floor. When there is no sign of green colour in the pool, premises owners/occupiers shall thoroughly vacuum the SP. Dead algae should be removed through draining to sewer and not through the filter.

3.3.5 The pool filtration system should be backwashed to ensure that any dead algae is not trapped inside the filtration system.

3.3.6 Water samples taken from the SPs shall pass all regulated limits stipulated in the Environmental Public Health (Swimming Pools) Regulations before the SPs are allowed to be re-opened for use.