Method Statement for Microbiological and Chemical Sampling
Evaporative Cooling Systems

This method statement has been prepared for Suppliers tendering for work that includes the Bacteriological and Chemcial Sampling of Evaporative Cooling Systems. ~~in accordance with ????????~~

This Method Statement deals only with the Technical Aspects of Sampling. It is not a Safety Method Statement and its use is limited to parity of tendering to ensure all tenderers are pricing for the same quality of service.

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Evaporative Cooling Systems

1 Sampling General:

1.1 All samples are to be recorded by the contractor, as prescribed within Annex G of BS 8554 (see Appendix A of this document.

1.2 Each sample bottle will be marked up with indelible marker pen.

1.3 A clean pair of disposable gloves are to be worn when taking each sample.

1.4 Cold (<20ºc) samples will be stored in a cooler bag containing a cool gel pack or some other mechanism of achieving a steady temperature during sample transport unless stated otherwise in the individual method. Please note the following:

a. The ice or gel pack must not come into direct contact with the sample bottle.
b. The storage temperature is dependent on the bacteria being sampled i.e.:
    i. Legionella species need to be kept <20°C ideally circa 18°C which will be possible with a cooler box with ice or gel pack depending on ambient temperature the box is being stored within and the time to transport to the lab. This must be within 6 hours of the sample being taken; beyond this and up to 48 hours a datalogger must monitor the temperature throughout its journey.
    ii. TVC's E-Coli, Coliforms and Pseudomonas aeruginosa samples need to be brought down rapidly to (5 ±3)°C and therefore must be refrigerated. After taking these samples they must be placed in a gel or ice cooled cooler box and transported to either a refrigerated vehicle or a refrigerated cooler box capable of reducing the temperature to (5 ±3)°C. A data logger must be placed within the cooler box and stay with this batch of samples until delivered to the Lab. The sooner these samples are delivered to the Lab the better, but a maximum of 24 hours.
    iii. The sampler must supply the data logger ensuring it is included with the samples throughout their journey from placing the sample batch within the cooler box to their removal, and handover into the care of the Lab. The sampler must present the datalogger report along with the sample certificates from the Lab; including reference identification so the sample batch can be related to the datalogger.

1.5 Hot (>50ºc) samples will be stored in a cooler box or bag. Please note the following:

a. Hot water samples are likely to be 60°C + they need to be reduced and stabilised <20°C for Legionella SPP as soon as practical, for TVC's, Pseudomonas aeruginosa the samples temperature need to be reduced to (5 ±3)°C.
b. (***NOTE:*** E-Coli and Coliforms should not be taken from hot water, as these organisms cannot survive in hot water) Any positive samples are likely to through environmental contamination.
c. If hot water samples are placed directly into a gel or iced cooler bag the heat load is likely to overwhelm the cooling ability of the gel or ice pack. Therefore, after taking these samples they must be placed in a gel or ice cooled cooler box and transported to either a refrigerated vehicle or a refrigerated cooler box capable of reducing the temperature to (5 ±3)°C. A data logger must be placed within the cooler box and stay with this batch of samples until delivered to the Lab. The sooner these samples are delivered to the Lab the better, but a maximum of 24 hours.

1.6 Mixed temperature (38ºc – 43ºc) samples will be stored in a bag with added ice or gel pack. Please note the following:

a. For Legionella these blended samples need to be reduced to <20°C as soon as possible, as 38 to 43°C is within the optimum growth temperature range for most pathogenic bacteria; for TVC's
b. For Pseudomonas aeruginosa, E-Coli and Coliforms the sample temperature needs to be reduced to (5 ±3)°C. If these samples are placed directly into a gel or iced cooler bag the heat load is likely to overwhelm the cooling ability of the gel or ice pack. Therefore after taking these samples they must be placed in a gel or ice cooled cooler box and transported to either a refrigerated vehicle or a refrigerated cooler box capable of reducing the temperature to (5 ±3)°C. A data logger must be placed within the cooler box and stay with this batch of samples until delivered to the Lab. The sooner these samples are delivered to the Lab the better, but a maximum of 24 hours.

1.7 Where Point of use Filters (POUF) are attached to outlets (whb showers etc) which require sampling they are NOT to be removed unless a replacement filter is available to be fitted. Operatives need to be trained on aseptic install of such filters.

~~1~~2 Evaporative Cooling Tower Legionella Sampling: BSEN7592:2008

Sampling Point and Pond Technique:

~~1.1~~2.1 Post-flush samples should be collected from sample taps that have been disinfected 1,000mg/L of Sodium Hypochlorite and left to stand for two minutes for the disinfectant to take effect, it is important to collect samples at locations that correspond (at the time sampled) to the highest risk – the highest numbers of legionellae occur in circulating water just after the pumps have been switched on. Thus, if possible, samples should be collected shortly after pumps have initially been switched on. If sediment accumulation is excessive, it might be advisable to sample the sediment.

~~1.2~~2.2 Ideally, a sample point should be fitted on the return service to the cooling tower, located near to the heat source, for example, just after the refrigerator condenser.

~~1.3~~2.3 During sampling a 1000ml bottle shall be used to collect the sample water in the same fashion as a routine Legionella sample from any other outlet. The cap should be kept in the sampler`s hand and positioned so that debris does not fall into the cap causing contamination hold the internal side of the cap down

~~1.4~~2.4 If no such sample point is available, then a sample should be collected from the cooling tower pond at a point furthest removed from the fresh water inlet valve (a tap might be provided at an appropriate point on the side of the pond furthest removed from the fresh water inlet).

~~1.5~~2.5 Samples should not be taken from the drain valve as part of a routine monitoring programme, as any sample collected might not be representative of the circulating water.

~~1.6~~2.6 Samples should be collected, if possible, when the biocide is at its lowest concentration and there is a maximum potential number of legionellae present, for example:

~~1.7~~2.7 when re-circulating pumps have

i. just been started;
ii. at the time after which any biocidal activity has ceased, and immediately prior to the next biocide addition;
iii. at the period of time just before any dilution of the water takes place either by automatic or manual operation.

~~2~~3 Evaporative Condensor Legionella Sampling: BSEN7592:2008

Sampling Point and Pond Technique:

~~2.1~~3.1 Samples should be collected from the pond at the point furthest removed from the cold-water inlet or a dedicated sample point.

~~2.2~~3.2 The dedicated sample point should be disinfected before sampling in the same manner as domestic outlets.

~~2.3~~3.3 Ensure that 1,000mg/L of Sodium Hypochlorite is poured inside the nozzle of the sample point until is fully drenched and disinfectant runs out.

~~2.4~~3.4 Two minutes should be allowed for the disinfectant process to take place.

~~2.5~~3.5 The sample point should be turned on and water run to waste to ensure all residual disinfectant is removed and all disinfected water flushed out of the outlet, typically 30 s to 60 s.

~~2.6~~3.6 When this has taken place and without adjusting the flow of water, the 1000ml sample container should be filled almost to the top just leaving a small air gap. The cap should be kept in the sampler`s hand and positioned so that debris does not fall into the cap causing contamination hold the internal side of the cap down

~~2.7~~3.7 Record the temperature and/or biocide concentration of the water at the time of sampling.

~~2.8~~3.8 The container should then be capped, and the contents inverted several times to ensure any biocide neutralising agent is well mixed within the water.

~~2.9~~3.9 Samples should not be taken during make-up.

Appendix A – Example Log for avoidance of deviating samples

Annex G (informative) **Example documents used to avoid deviating samples**

Figure G.1 Example log