Acceptance guideline 10: Cooling tower / Boiler Discharges

Overview

The purpose of this acceptance guideline is to outline under what circumstances Icon Water will permit the discharge of liquid waste into the sewerage network.

Under section 35 of the *Utilities (Technical Regulation) Act 2014*, it is an offence to discharge into the water or sewerage network any substance that is likely to interfere with the network, or form compounds that would be likely to interfere, unless the consent of the utility is obtained. Significant fines, imprisonment or both may result from an offence. Discharges entering an Icon Water sewer that are in breach of the conditions set out in this guideline will probably constitute a breach of section 35 of the *Utilities (Technical Regulation) Act 2014* and may lead to prosecution of the person discharging the waste, or allowing the waste to be discharged.

This Guideline contains specific information on waste types and discharge requirements. The requirements of this Guideline are in addition to the requirements specified in *Trade waste guideline 1: General acceptance criteria for liquid waste.*

Cooling towers

Description of activity

The continuous “bleed off” and other wastewater from both commercial and industrial cooling towers is liquid trade waste.

“Comfort and process air-conditioning cooling towers” are defined as cooling towers that are dedicated exclusively to (and are an integral part of) heating, ventilation, air-conditioning or refrigeration systems associated with commercial living space air-conditioning, or commercial process air-conditioning such as computer rooms. The discharge rate from cooling towers in this classification should not exceed 500 L/h.

“Industrial Cooling Towers” are cooling towers used in manufacturing for rejecting heat extracted from a manufacturing process. This activity is classified as High Risk and High Risk Guidelines need to be followed.

Other issues

Commercial and industrial cooling towers generate wastewaters that vary considerably in the contaminants they contain according to the water treatment utilised.

Icon Water strongly encourages the use of chemical free water treatment systems. Each specific cooling tower chemical should be approved by Icon Water prior to discharge to the sewerage network.

Boiler blowdown

Description of activity

Boiler blowdown, or bleed-off, is the water discharged from a boiler. During the boiler blowdown process, water is discharged from the boiler to avoid the negative impacts of dissolved solids (impurities) on boiler efficiency and maintenance.

The discharge from boilers is generally continuous. However, Icon Water may approve applications for a one-off discharge from closed boiler water systems (e.g. due to periodic maintenance/cleaning). These discharges may involve high volume of trade waste over a short period of time and can be approved provided that the discharge is at an approved rate. This rate is generally taken to be 500 L/h to a sewerage system serving not less than six (6) tenements.

If chromate has been used in a closed boiler water system, the wastewater must not be discharged to the sewerage system. It should be collected in containers and transported off site for disposal in accordance with ACT EPA requirements.

Pre-treatment requirements

The boiler blowdown water is often very hot and can cause damage to sewerage infrastructure. It can also increase biological activity, which can rapidly reduce the oxygen content of the sewage, resulting in the generation of sulphides and corrosion of the sewerage system.

A cooling pit/tank is required to reduce the wastewater temperature to less than 38°C. To achieve the temperature requirement, the volume of the proposed cooling pit/tank should be at least three (3) times the maximum blowdown volume. If the pit/tank is smaller than this, Icon Water would require the applicant to provide cooling pit size calculations for pit/tank to achieve the required temperature, authorised by an Engineer. Pits should also be ventilated to assist with the cooling of the water within the pit.

As boiler blowdown water contains metals, pH adjustment may be required to drop-out the metals and then pH correction prior to discharge.

Other issues

Chemical additives

Chemicals may be added to the boiler water to inhibit corrosion or reduce scale. These may contain chromium. Alternative chemical additives should be used in place of chromate additives. The discharge of chromium-bearing liquid trade waste is prohibited.

Heating/Cooling Activities		
Boiler blowdown	Total Dissolved Solids, high temperature	Cooling pit/tank to reduce wastewater temperature to less than 38°C. If the volume is less than three times the maximum blowdown volume, cooling calculations are to be provided by the applicant.
Cooling tower bleed off	Corrosion inhibitors, biocides	No treatment. The use of products containing chromate is not permitted.

Table 2: Chemical waste acceptance criteria

Class		Chemical	Discharge acceptance limit (mg/L)
1.	**Oxidising Biocides**		
(a)	Chlorine releasing compounds	Chlorine Calcium hypochlorite Sodium dichloroisocyanurate Sodium hypochlorite Trichloroisocyanuric acid	5 mg/L total for all chlorine releasing compounds except as noted below [(1)]
(b)	Bromine releasing compounds	Bromine Sodium hypobromite (hypochlorite generated)	10 mg/L total for all bromine releasing compounds [(1)]
(c)	Halogenated hydantoins	Bromochlorodimethyl-hydantoin	5 mg/L chlorine 10 mg/L bromine
(d)	Hydrogen peroxide		no upper limit [(2)]
(e)	Ozone		No upper limit [(2)]
2.	**Non-oxidising biocides**		
(a)	Pentachlorophenol	Pentachlorophenol Sodium Pentachlorophenate	Prohibited
(b)	Organo-tin compounds	Tributyltin Tributyltin oxide	Prohibited
(c)	Aldehydes	Glutaraldehyde	0.05 mg/L
(d)	Chromium compounds	ALL	Prohibited

These limits are as prescribed for bromine and chlorine in Acceptance Guideline 1.

[(1)]Acceptable, subject to agreement to management plan for use of these substances, since these materials are not persistent.

[(2)]The limit for ammonia prescribed in Acceptance Guideline 1 does not apply since quats do not readily break down to ammonia and have very low toxicity.

Approval conditions

Chemicals for which limits are not indicated above or in Acceptance Guideline 1, or which a customer may wish to discharge in concentrations in excess of these limits, will be considered for acceptance to the sewer on the basis of their potential to affect the sewerage system, i.e. that the chemical(s) will not detrimentally effect:

- Biological sewage treatment processes,
- Value of reuse products derived from the sewage stream,-
- In-sewer conditions such as to create public or OH&S risks,
- Fabric of the sewerage system; and
- The environment from resulting sewerage system discharges or emissions.

Some chemicals may be unacceptable for entry to the sewerage system. The customer may need to incorporate such restrictions into the specification for the operations and maintenance contract.

Overdosing of chemicals and use of expired date chemicals is not permitted.

Icon Water may prescribe discharge flow rates as part of the approval conditions.

Customers must keep service contracts which include the cooling water system management plan available for inspection by Icon Water.

Stormwater

Icon Water does not permit the discharge of stormwater to sewer. All areas draining to sewer must be roofed and bunded to prevent the entry of stormwater, including rain descending at an angle of up to ten degrees from the vertical.

Further information

Additional information about the discharge of liquid waste into Icon Water's sewerage network is available at **iconwater.com.au/tradewaste** or by contacting us on **02 6248 3111** or via email on **talktous@iconwater.com.au**