5 MINUTE GUIDE

Reduce trade waste impact

This 5 Minute Guide provides the tools for companies to review and reduce their trade waste impact. Companies are beginning to realise the potential value of their wastewater and the savings that can be made in avoiding, reusing and recycling onsite, rather than disposal to sewer. Trade waste can often contain valuable materials, not to mention significant volumes of water which could potentially be reused.

Similarly, increasing costs and public pressure to improve efficiencies is resulting in companies investigating cost effective ways of sourcing, reusing or treating and recycling their wastewater. Business and society is increasingly recognising that 'water can be used more than once'.

What is trade waste?

'Trade waste' is any wastewater discharged from commercial, industrial, laboratory or trade activities. It specifically excludes any wastewater discharged from domestic premises.

Discharge of trade waste requires a trade waste agreement, under which trade waste discharge is measured (or a factor is applied based on potable water use) and the quality of the trade waste analysed for pricing.

Trade waste is a blend of many waste streams, including cooling tower and boiler blow down, process by-products, unreacted chemicals and Clean In Process (CIP) waste streams.

Fig.1 Wastewater drain to trade waste

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How is it charged and why?

Trade waste charges are based on volume and the concentration of contaminants. The primary contaminants upon which trade waste charges are calculated are:

- Biological Oxygen Demand (BOD),
- Total Suspended Solids (TSS),
- Total Nitrogen (TN) (or Total Kjeldahl Nitrogen (TKN)),
- Total Phosphorus (TP), and
- Total Dissolved Solids (TDS).

Trade waste charges are calculated on the load of contaminants in kilograms per day, where load = volume of trade waste x concentration. (These charges vary between water authorities, e.g. City West Water does not charge for Phosphorous.) ➲

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Trade waste is a separate charge to sewage and incurs additional costs as these flows require greater effort by the receiving wastewater plant to treat, capture and dispose of the contaminants.

Fig.2 Buffer water storage tank

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Planning for reuse

Planning for reuse of trade waste should take into account the relationship between concentration and load of contaminants. Trade waste charges are based on the mass load of a particular pollutant rather than its concentration. This relationship is important when increasing water efficiency as trade waste volume will decrease resulting in a saving, however, contaminant concentrations can increase as a result of reduced dilution.

Discuss increases in concentration and impacts on the sewerage system with the local water authority to ensure the Health and Safety of sewer workers, that there are no adverse impacts on sewer assets or processes downstream.

Discuss and negotiate with the local water authority when implementing trade waste changes to get recognition of water savings and reduced trade waste impact where possible.

Fig.3 Trade waste from process

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How to reduce trade waste impact

1. Chemical Substitution

One area for trade waste impact reduction is in the substitution of chemicals used in processes, cleaning and wash down procedures. By substituting these with lower impact chemicals that result in less salts or more neutral pH levels, the mix of pollutants entering the sewer can be avoided or reduced.

Example investigation

Company A uses large amounts of sodium hydroxide (NaOH) for their process. Water Authority B, which supplies the infrastructure to Company A, must recycle all of their wastewater effluent as they cannot discharge to a local water body. However, due to the high loads of sodium in their wastewater, reuse is very difficult and limited to the areas where saline water can be handled. Subsequently, Company A must pay significant charges for the sodium in their trade waste discharge.

One potential solution for Company A would be to investigate their ability to substitute NaOH with Potassium Hydroxide (KOH). This step would completely remove their sodium waste stream from their trade waste. In a holistic assessment of the chemical substitution, KOH is more expensive than NaOH, however, with a reduction in their trade waste charges, there may be a payback or breakeven point in this situation. Any additional requirements for storing and using KOH should be

investigated to ensure product quality is not negatively impacted and existing infrastructure is capable of handling the change.

2. Process sequencing / Clean In Place (CIP) sequencing

By carefully considering the sequencing of process batches or production cycles, there are often opportunities to sequence or schedule similar products without the need for CIP cleans and rinses between batches. Even small reductions in CIP wastewater through reduced rinsing time for lower purity products can positively impact overall trade waste load.

By cleverly scheduling process runs, the volume and loads of cleaning chemicals can be reduced, thereby reducing the impact on trade waste.

3. Closed loop systems

In many industries water which is still of high quality is discharged to trade waste after a single use due to strict quality requirements for product manufacturing. This may be from cooling tower bleeds (after a single run through), heating and cooling closed loops, chillers, etc. While this water may not contribute to pollutant loads, it will be included in the volume of trade waste used to calculate the trade waste charges. Removal of this volume can therefore reduce trade waste impact (by reducing volume disposed to sewer) and trade waste charges.

4. Shared trade waste discharge

Many chemical and plastics companies are required to perform pH correction prior to discharge to meet the terms of their trade waste agreement. In some circumstances, neighbouring facilities will be doing the same. Potentially, if one stream is acid and the other alkaline, the two neighbouring facilities could mix their waste streams and both avoid the need for pH correction. This requires several open discussions between the two parties, the water retailer and changes to trade waste agreements but offers both companies the opportunity to reduce their operating costs for pH correction of a stream going to sewer.

5. Treatment and recycling

In some cases where trade waste charges represent a significant cost in the operating budget, treatment and recycling of the wastewater may be economically viable or fit the environmental objectives of the company. Depending on the nature of the trade waste and the type of pollutants, treatment could include filtration, biological digestion, chemical treatment, desalination or other. Investigations into treatment and recycling should include overall impact on operating costs such as energy, carbon emissions, chemical use and any waste streams that may be produced. It is also important to take into account the savings that are achieved both in trade waste charges as well as water use. A cost/payback analysis should be done to take into account all these variables to determine if treatment is appropriate.

Case Study

Colortrend Australia are a colourants company located in Dandenong. In 2009, focussed on reducing their trade waste impact, Colortrend Australia altered the chemicals used in their trade waste treatment process which significantly reduced the quantity of filter cake being produced and thus directed to landfill. The filter cake was also re-categorised from Prescribed Industrial Waste (PIW) to Industrial Waste. Colortrend Australia will in the future look at options to reuse this filter cake in lower grade inks further improving the sustainable use of their products.

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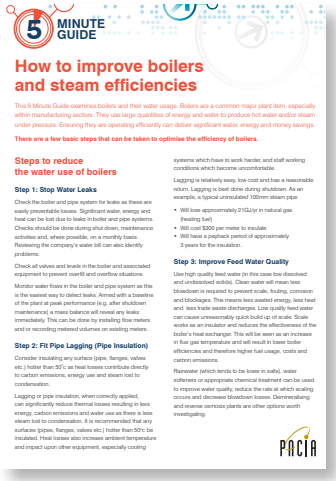

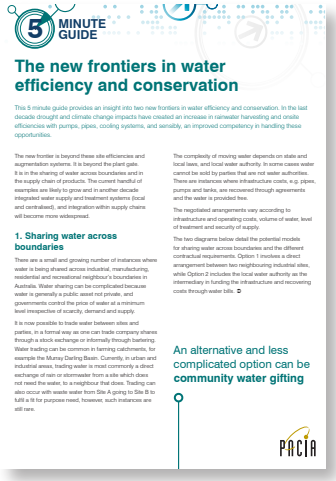

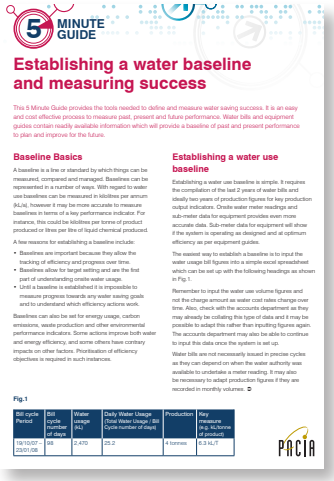

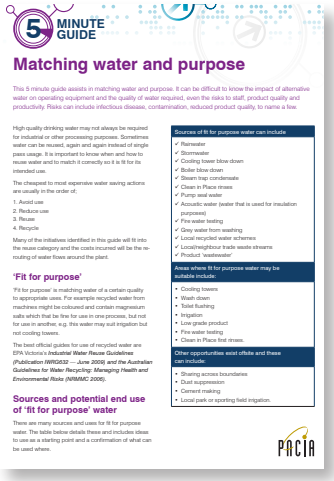

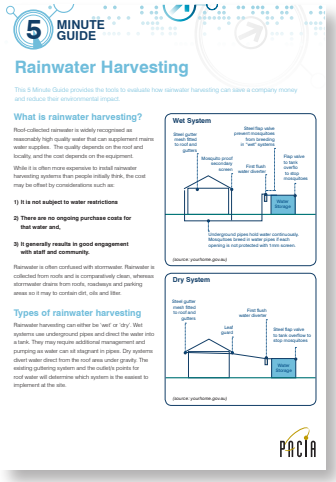

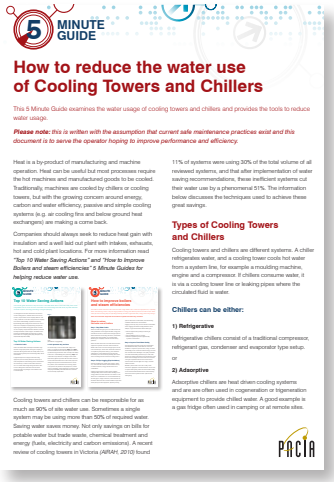

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