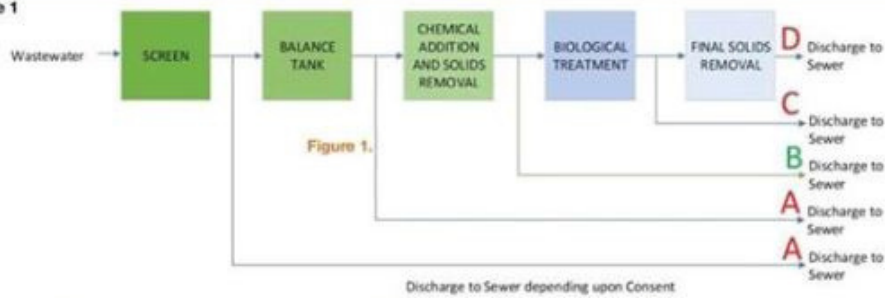


Figure 1



Parameter	Consent	A	B	C	D
Flow m <sup>3</sup> /hour	20	10	10	10	10
Settled COD mg/l	4,000	4,000	2,000	500	250
Suspended solids mg/l	2,000	2,000	150	300	20
Annual Charge		£550,000	£175,000	£100,000	£50,000
Savings over A			£375,000	£450,000	£500,000

Assume plant runs 20 hours a day, 350 days a year and for illustration only – excludes any sewer connections charges, operating costs and capital costs.

# A win/win situation

David Gaskill discusses meeting regulatory and environmental compliance requirements through proper wastewater management.

During the production of food and beverages, wastewater (effluent) is often created as a by-product. Sometimes this is as a direct result of the product, but often it is caused by the cleaning-in-place (CIP) solution often used on equipment within food production facilities. This wastewater needs to leave the site in order for the factory to operate, and produce goods.

As the demand for water grows around the World it is now considered a major resource, so re-using water not only helps to reduce a company's reliance on its

oxygen required to reduce the organic content of the wastewater. For Mogden, the sample is usually left to settle for an hour before the supernatant is tested.

- **TSS:** This is the total suspended solids within the wastewater.

Assuming the site has implemented a water audit and is producing minimal wastewater, on site treatment plants can easily reduce the suspended solids and associated COD, therefore ensuring Discharge Compliance and cost savings. Figure 1 demonstrates a typical wastewater treatment plant at a food and beverage site and the various stages where savings can be made.

In the Figure 1 example, it is assumed that if the factory is already in compliance for discharge to sewer, meaning the Mogden costs could be around £550,000 per annum. By installing a balance tank, chemical addition and solids reduction stage (B), companies could save up to £375,000 per annum against untreated

supply, it also provides cost savings for the business. These savings come from the 'bottom line', meaning any savings made result in increased profit for the company.

The wastewater generated can be disposed of either by tankering off site or by on site treatment, which can then be discharged to a sewer or river. Tankering can be cost effective when there are small volumes of wastewater, but the factory is still reliant on the tankers for a safe and legal disposal route, to enable the factory to continue producing goods. Whereas, depending upon the requirements, wastewater can be treated for re-use in the factory. This often occurs in the vegetable industry where the wastewater is treated and then re-used for washing the vegetables, with the final rinse using potable water.

If there are sufficient volumes of wastewater it is often discharged to drain (sewer). In doing so, it must meet the Discharge Consent imposed by the local Water Companies. Not meeting the

discharge to sewer. As more stages are added, such as reducing the COD and suspended solids further, the savings on the Mogden Charges also reduce in magnitude. For discharge to river, all the above stages would be needed to ensure compliance.

## Easily implemented

Chemical addition and solids reduction can easily be implemented in the form of chemical mix tanks followed by either settlement tanks or dissolved air flotation. These process stages reduce the suspended solids and the COD associated with solids. This stage offers the biggest savings on the Mogden Charges and often enables consents to be met without further treatment. If further treatment stages are required for consent compliance, then additional savings under the Mogden Costs are achieved and the factory can continue producing their goods. This is a win/win.

Even if discharging under consent, reduction of the Mogden Charge will

Discharge Consent could result in a fine.

As well as the Discharge Consent, the local water company will also charge a fee based on the characteristics of the wastewater and the volume discharged which is known as the Mogden Formula which is the cost that UK water companies charge a business to dispose of the wastewater into the foul sewer.

There are several aspects to the Mogden Charge which creates the bill. In order to reduce the Mogden Charge the following three variables can be altered – listed in terms of the highest impact to the lowest:

- **Flow:** The lower the flow, the less the charge will be. So, look at water management across the site and put the findings in place. Simple tips like putting stop guns on manual wash hoses can not only reduce the cost of water coming into the factory but also reduce the cost of wastewater leaving the factory.
- **COD:** COD is Chemical Oxygen Demand of the wastewater. This is the amount of

provide bottom line savings for the business. In the figure 1 example, approximately £375,000 savings per annum can be made which can be put towards the business case for the new treatment plant. Since the savings are ongoing, this reduces costs to the company. How much product needs to be sold to generate this amount of money to pay the bill, which can easily be saved through investment?

Installation of equipment for balancing, chemical conditioning and suspended solids reduction of wastewater is a typical and standard approach within the food and beverage industry. For capital plant, the project may take several months to complete but equipment can be hired in while the main plant is being built, providing instant discharge compliance and cost savings. Equipment from Silbuster has been hired for just such situations, as well as Biological Treatment stages if needed. ■

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