Trade Waste Strategies for CEC Management

for the qldwater

Emerging Contaminants Workshop

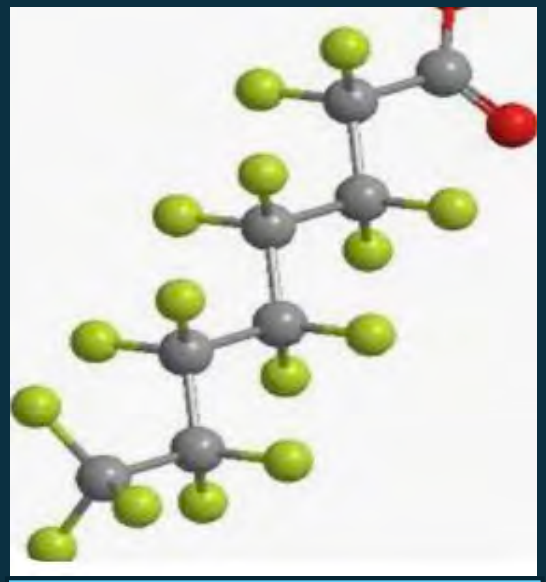
James Cook University, Townsville

21-22 November 2024

Colin Hester - qldwater

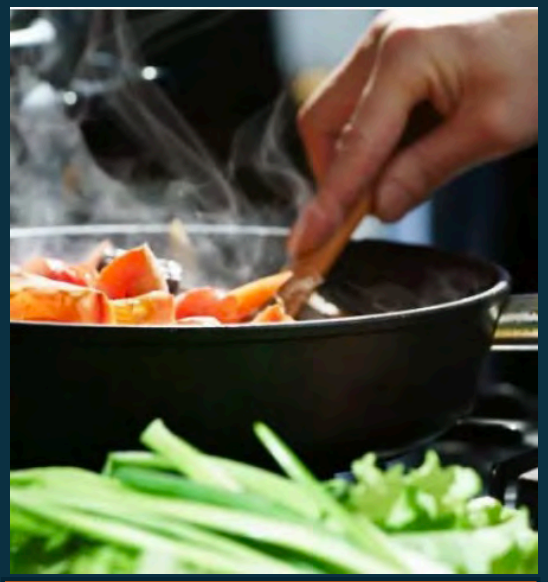
THE SADLY LINEAR LIFE CYCLE OF MOST CEC'S

MAKING THEM



IMPORTING THEM

USING THEM



DISPOSING OF THEM

WATER SERVICES
ASSOCIATION OF AUSTRALIA

TRADE WASTE GUIDANCE VALUES FOR WATER UTI

Addendum to the Australian Wastewater Quality Management G

August 2024

Equation 2: Calculation of Uncon

L_{UNC} = (Influent [BOD] mg/L)(WW

= (220 mg/L)(4.2 ML/d) = 92

Where:

Influent [BOD] = Current influent BOD concentration (m

$WWTP_{VOL}$ = Current hydraulic load at WWTP (ML/d

Calculating the MAIL

In this case, the utility has determined that it does not wish to excee without commencing capital works augmentation. To enable the hig business, the utility has elected to not apply a safety factor for this well-characterised in its monitoring programs and treatment proces

Equation 3: Calculation of

MAIL = MAHL(SF) – (L_{UNC} + Ta

Where:

MAIL = Maximum allowable industrial load
MAHL = Maximum allowable headworks load (1260 kg/d)
SF = Safety factor (in this case no safety factor applied)
TaW= Tankered waste
L_{UNC} = Load from uncontrolled and other sources (924 kg/
GA = An allowance for growth (126 kg/d = 10% WWTP c
i.e. MAIL = 1260(1.00) - (924 kg + 120 kg + 126 kg) = 90 kg

The maximum allowable industrial load (above the existing backgro 10% treatment capacity is calculated to be 90 kg/d (Equation 3).

Allocating MAIL

The utility should now give consideration (based on local context) to the significant industrial customer and any customers that may eme apply a mass load limit in its approval – such limit is usually applied

A utility may set specific limits on a case-by-case basis – this is like appearance of another significant industrial discharger is unlikely. If load to a discharger, they should make sure the mass load is efficie pretreatment options are installed, maintained in accordance with g allocate up to 90 kg/d subject to assurances that the load is efficien

A utility may decide that it should retain capacity for future significar than a nominal percentage of the MAIL (e.g. 25%) to any emerging the authority expects additional business to seek discharge approva industrial park that is not yet fully occupied).
e.g. the authority may allocate 25% of the MAIL (22.5 kg/d) subject generated.

In all cases, the utility should ensure it does not over-allocate the M program to track and compare the influent loading against the alloc

Source: Colin Hester – Queensland Water Directorate

Case Study: Setting a Local Limit for a Significant Discharger – Queensland Water Directorate

A local trade waste limit is developed where a significant industrial discharger seeks approval to discharge BOD_5 within a relatively small regional sewerage catchment.

Background

A large food processer is an important component of the local economy in a regional town and seeks to discharge a higher than guideline amount of organic material (measured as biochemical oxygen demand) to support an expansion of their business.

The following background data is relevant:

Regional WWTP rated average design capacity (organic):	21,000 EP
BOD per EP (per planning scheme):	60 g
Volume per EP (per planning scheme):	210 L/p/d
Current WWTP average hydraulic loading:	4.2 ML/d
Current WWTP influent [BOD_5]:	220 mg/L

The utility wishes to assess, consider and verify the amount of BOD_5 discharge it should approve as trade waste from the individual significant industrial discharger (having a view to maximising support for the local company without risking WWTP overload or preventing growth).

Problem

What is an appropriate methodology for determining a BOD_5 discharge limit for a large industrial discharger in a relatively small regional sewerage catchment?

Solution

General Approach

In general, when setting local limits, the utility should calculate the allowable headworks load (AHL) based on each environmental and treatment process criterion (land application/sludge specification limit, effluent discharge limit, treatment capacity, process inhibition limit). The most stringent limit is referred to as the maximum allowable headworks load (MAHL).

MAHL for Conventional Contaminant

Because BOD_5 is a conventional contaminant the WWTP is designed to remove, the MAHL can be estimated from the plant's rated average design capacity (21,000 EP).

[This approach can be applied to other conventional contaminants, such as nutrients and total oil and grease, but for non-conventional contaminants, such as metals and organics, full consideration must be given to each individual AHL to determine the limiting MAHL].

Evaluation

Using the known average design capacity, the MAHL is calculated using Equation 1:

Equation 1: Calculation of MAHL

$MAHL = EP_{DESIGN} . EP_{BOD}$

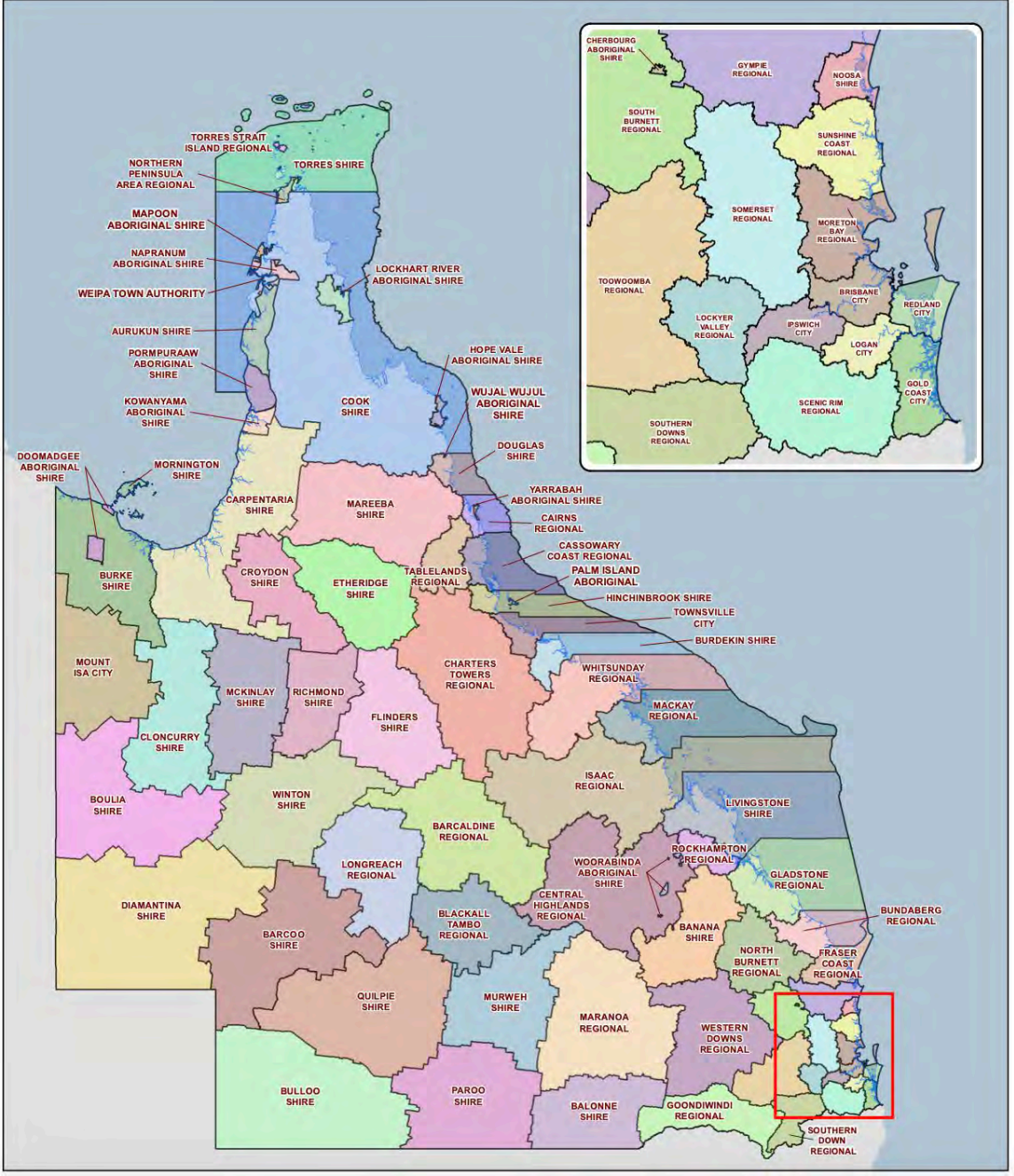
Where:

MAHL = Maximum allowable headworks load

EP_{DESIGN} = WWTP average design capacity (organic) 21,000 EP

EP_{BOD} = Planning scheme grams BOD per EP 60 g/EP

i.e. MAHL = (21,000 EP)(60 g/EP) = 1260 kg/d



A Workable Strategy

- Gain support for the idea of a consistent model trade waste management system. Communicate that it's better for customers, enables regulatory support and an avenue for prioritisation, provides guidance, and costs less.

- Develop and demonstrate implantation at the QWRAP (Council alliance) level. This enables the input of local government and regulatory stakeholders at a scale that is low risk and manageable to start with.
    - Look critically at the desirable outcomes of twenty-first century trade waste and gently drop the lower priority activities.

    - Redirect effort from low priorities to higher priorities (including emerging contaminants)

- Review and adjust the performance of the model at the QWRAP level.

- Expand the model TWM system for state-wide implementation

A Workable Trade Waste Strategy

1. Embrace the “portfolio approach” to management of CEC (do your best work in trade waste management).

2. Come along with *qldwater* on its project to develop a model Trade Waste Management System in 2025 (supported by you, WSAA and the state-funded QWRAP program)

   It will enable you to participate in a project to materially uplift Queensland’s trade waste management performance through:

   a. Critical re-evaluation of 21st century trade waste management priorities.

   b. Identification and implementation of trade waste efficiencies.

   c. Development of clear guidance and consistent documentation.

   d. Advocacy for legislative levers to support practitioners.

Coming next year…

10 – 12 September 2025 in Brisbane

WSAA Wastewater Source Management Network meeting

Hosted at qldwater premises in Eagle Farm


HAVE A SAFE TRIP