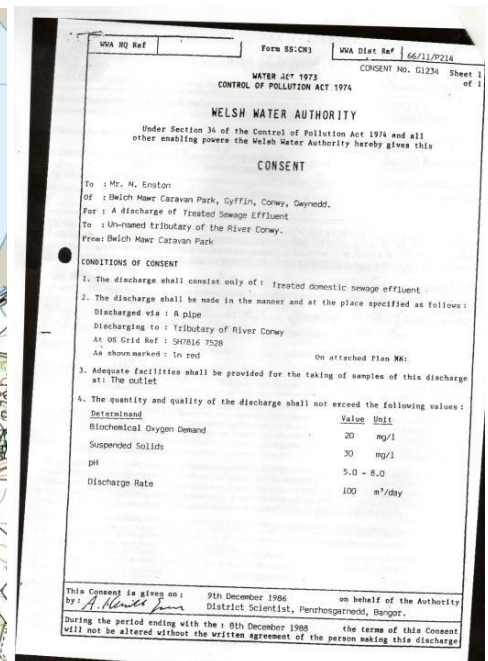


Dominic Enston
Conwy Lodge Park
Conwy
LL32 8UX

10th December 2025
Ref: STR-L10122025

Re: Wastewater Treatment Capacity Assessment



We inspected the wastewater treatment system on **10 December 2025** and found that the existing treatment plant was operational at the time of inspection and discharging final effluent to a surface watercourse in accordance with its consented outfall.

Regulatory Context and Assessment Basis

The wastewater treatment system is a **long-established discharge**, having been installed in **1985**. The works therefore **pre-date current wastewater treatment design and installation standards** and are regulated under an **existing bespoke Environmental Permit / historic consent to discharge**.

Assessment of treatment capacity and performance has accordingly been based on:

- Measured and historic site water-use data
- Installed treatment infrastructure
- Observed hydraulic behaviour
- Long-term operational and compliance history

rather than comparison with modern package treatment plant certification standards.

Description of the Existing Treatment Works

Biological Treatment Stage

The biological treatment stage comprises **five aerated tanks arranged in series**, providing a

combined active biological process volume of approximately **355.25 m³**, calculated as follows:

- Tank 1: 95,250 litres
- Tank 2: 65,000 litres
- Tank 3: 65,000 litres
- Tank 4: 65,000 litres
- Tank 5: 65,000 litres

Total active aerated volume: 355,250 litres ($\approx$ 355.25 m³)

Aeration is provided by **two rotary lobe blowers**, each rated at **10.5 kW**, giving a total installed aeration power of approximately **21 kW**. The biological stage is followed by a tertiary treatment stage comprising **two filter beds**.

A further **150 m³ tank** is available for recommissioning as **aerated equalisation and/or maturation capacity**, increasing the total active process volume to approximately **505.25 m³** where brought into service.

Tertiary Treatment Stage (Filter Beds)

Prior to discharge to the watercourse, final effluent passes through **two tertiary filter beds**, each approximately **3 m × 3 m × 3 m** in size:

- Individual filter bed volume: **27 m³**
- Combined media volume: **54 m³**
- Combined plan area: **18 m²**
-

At the assessed wastewater flows of:

- **~30 m³/day average**, and
- **~60 m³/day peak**,

the filter beds operate at hydraulic loadings of approximately **1.7-3.3 m³/m²/day**.

Assuming a typical domestic BOD concentration of **300-350 mg/L** at the filter inlet, the resulting **volumetric BOD loading** is approximately **0.2 kg/m³/day**, which is well within typical design ranges for tertiary polishing filters. The filter beds therefore provide effective additional removal of residual BOD, suspended solids and ammonia, and enhance overall process resilience during peak loading conditions.

Measured Flows and Seasonal Usage

Historic site water-use data indicates a **strongly seasonal loading profile**, typical of a holiday/caravan park:

- **Average daily water usage (annualised): ~40 m³/day**
- **Peak summer water usage: ~80 m³/day**
- **Estimated non-wastewater use: ~25%**

Estimated wastewater flows to treatment are therefore:

- **Average wastewater flow: ~30 m³/day**
- **Peak wastewater flow: ~60 m³/day**

The data indicate that the works currently operate well below continuous maximum loading.

Hydraulic Capacity and Retention Time

Based on the existing biological tanks (**355.25 m³**):

- **Average HRT:** ~8.4 days
- **Peak HRT:** ~4.2 days

Where the additional **150 m³ tank** is recommissioned and operated as aerated equalisation or maturation volume, total process volume increases to approximately **505 m³**, providing improved hydraulic buffering and enhanced biological stability during peak periods.

Aeration Capacity

- **Blower type:** DH52M rotary lobe
- **Rated power:** 14 HP (10.5 kW) each
- **Speed:** 1475 rpm
- **Operating pressure:** ~0.5 bar
- **Number of blowers:** 2
- **Total installed power:** ~21 kW
- **Indicative airflow:** ~800-1150 m³/hour

This level of aeration provision is consistent with a **1500 to 1850 PE extended aeration system**, subject to appropriate operational control and maintenance.

Capacity Assessment and Conclusions

Based on:

- Measured wastewater flows,
- Installed aeration capacity,
- Hydraulic retention times,
- Presence of tertiary polishing filters, and
- Observed long-term compliant operation,

the treatment works can be **conservatively rated at 1500 PE** under normal operation.

With the recommissioning of the **150 m³ aerated equalisation tank** a realistic upper operating envelope of up to approximately **2000 PE** can be achievable.

Limitations and Declaration

We are independent septic tank and sewage treatment plant installers. This report is based on the **observable condition and performance of the wastewater treatment system as inspected on 10 December 2025**, together with information provided by the client and available historic data. No intrusive investigation or extended performance testing was undertaken as part of this assessment.

I hope this report meets with your satisfaction, if you have any queries then please feel free to contact me.

Lee Wiggins

Tekneka Ltd