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Phosphate Impact Report

MAESGLAS CARE HOME, COACH HOUSE, GREEN STREET, LL14 9JF

Drainage and Phosphate Impact Report

Site Address: Maesglas Care Home, Coach House, Green Street, LL14 9JF

Proposal: Conversion of a 3/4 bed residential care home into two dwellings: one 1-bed house and one 2-bed house.

Executive Summary

This report supports a planning application for the conversion of a small residential care home overflow into two domestic dwellings. A one bed to the east and a 2 bed to the west, with no extensions and the removal of a rear porch.

This report demonstrates a net reduction in wastewater volume and phosphate loading, aligning with Wrexham's Local Development Plan (Policy NE6) and Natural Resources Wales (NRW) guidance supporting nutrient neutrality.

Existing Use – Residential Care Home

The current use of the property is as part of Maesglas Residential Care home, providing beds to 5 full time residents and 2 to 3 staff members. The Care Home has recently changed hands and as part of their restructure, they have sold the Coach House for alternative purposes.

It has been considered that a minimal change of use of the property without any extensions and minor external alterations would be considered the best strategy. Whilst also understanding the demographic where 1- and 2-bedroom properties are so sought after and limited.

What are phosphates?

Phosphates are chemical compounds containing the element phosphorus, which is essential for plant and animal life. In small amounts, phosphorus supports healthy ecosystems. However, according to EU Law in 2018 when present in excess, it becomes a major pollutant in freshwater environments.

Why are phosphates harmful?

Excess phosphates in rivers lead to a process called eutrophication. This occurs when high nutrient levels cause rapid growth of algae and aquatic plants. These algal blooms:

- Block sunlight from reaching other aquatic life
- Deplete oxygen levels when algae die and decompose
- Cause fish kills and disrupt entire ecosystems

Sources of phosphate pollution include:

- **Agricultural runoff** (fertilizers and manure)
- **Sewage and wastewater** from homes and care facilities
- **Industrial discharge**

The main studies and case law have been conducted in the Netherlands and the subsequent Eu Law relating to this revolves around Nitrogen pollution. However, Natural Resources Wales considers the principles should apply to other nutrients, meaning Phosphates in Wales.

Phosphate Impact Assessment

Phosphates are a pollutant in Welsh rivers, contributing to eutrophication and ecological damage. The River Dee SAC, which covers most of Wrexham, is currently failing against NRW's phosphate targets.

Policy Context – Wrexham Local Development Plan

EBNB04 - The Dee Catchment Phosphorous Reduction Strategy (DCPRS)

The DCPRS will deliver measures with two parallel objectives in mind:

a) To facilitate the delivery of development and avoid adverse effects to the SAC from planned growth as a result of the treatment of wastewater:

b) To achieve the conservation objectives of the SAC and Water Framework Directive requirements.

Policy NE6: Wastewater Treatment and River Water Quality

Policy NE6: Wastewater Treatment and River Water Quality requires:

- No adverse effect on SAC integrity
- Nutrient neutrality or reduction
- Preference for mains sewer connection

The proposal:

- Existing connection to mains sewer
- Reduces phosphate discharge
- Complies with NE6 and NRW guidance

The DCPRS supports developments that reduce nutrient loading.

Natural Resources Wales Guidance

NRW's August 2025 guidance:

- Requires Habitats Regulations Assessment (HRA) for SAC catchments
- Allows development if nutrient neutrality or reduction is demonstrated
- Recognises domestic conversions as lower risk

This proposal qualifies as nutrient-reducing, and therefore favourable under HRA screening.

Foul Drainage Strategy

- No new connections
- No private treatment systems
- No increase in discharge volume
- Improved environmental outcome

Key points and Calculations

The use of the existing property was for residential care and institutional care homes produce higher phosphate loads due to medical, laundry, and catering waste. It is seen that domestic dwellings produce lower phosphate concentrations.

- The proposal results in a ~55% reduction in wastewater volume and a substantial reduction in phosphate load.

To assess the expected wastewater output from the proposed development, we refer to the British Water Flows and Loads 4 Code of Practice. This document provides a nationally recognised set of values for estimating the daily volume and strength of sewage produced by different types of properties.

The guidance includes a comprehensive table of loadings, covering flow rates, biochemical oxygen demand (BOD), ammonia, and other key indicators, which allows designers to calculate the total daily sewage load from residential and non-residential buildings. These values are based on the latest research and best practice within the UK wastewater industry and are widely accepted by regulatory bodies including Natural Resources Wales (NRW).

Although originally developed to support the design of non-mains sewage treatment systems, such as septic tanks and package treatment plants, the Flows and Loads data is now commonly used in planning applications to:

- Estimate the environmental impact of new developments
- Support nutrient neutrality assessments
- Demonstrate compliance with local and national drainage policies

It is strongly recommended that all designers and planning applicants use this guidance when calculating wastewater volumes, especially in sensitive catchments like the River Dee SAC, where phosphate pollution is a key concern.

The existing use – 3 to 5 Personal Care Home

Between 3–5 residents which 2–3 staff members day and night.

- Residents: 350 Litres per day, 110 g BOD, 13 g NH_3 per person
- Staff: 90 Litres per day, 38 g BOD, 5 g NH_3 per person and 90 Litres per night, 38 g BOD, 5 g NH_3 per person or
- Resident Staff: 180 Litres per day, 75 g BOD, 10 g NH_3 per person

Estimated daily flow:

- Residents:

  3 x 350 = 1050 Litres per day

  4 × 350 = 1,400 Litres per day

  5 x 350 = 1750 Litres per day

- Staff:

  2 x 90 = 180 Litres per day

  3 × 90 = 270 Litres per day

  1 x 180 = 180 Litres per day

Using an average of 4 residents at 350L and 2-day staff at 180L, 1 resident staff at 180L, this gives us a total of 1,940 litres per day.

This represents high-strength wastewater with elevated phosphate concentrations.

Proposed Use – Two Residential Dwellings

Under Flows and Loads 4, a 1-bedroom property must allow use for 3 people, even though a 1-bedroom house can only officially house 2 people according to Welsh Housing Quality Standard (WHQS) 2023. Whereas a 2-bed must accommodate litre-age for 4 people.

Using Flows and Loads:

- Domestic dwelling: 150 Litre per day, 60 g BOD, 8 g NH_3 per person

Estimated daily flow:

- Unit 1: 3 × 150 = 450 Litre per day
- Unit 2: 4 × 150 = 600 Litre per day

This is standard domestic wastewater and totals 1050 litres per day for both unit. Providing a significantly lower nutrient concentration than the existing use.

Based on the code of practise estimates using the highest flows on the proposed and average lower litre flows on the existing, the proposed conversion from residential care home to two units totalling 3 bedrooms offers an 890-litre reduction per day.

Conclusion

This development:

- Reduces phosphate loading by 890 litres per day
- Complies with Policy NE6 and NRW guidance
- Aligns with positive precedent
- Improves environmental outcomes for the River Dee SAC in accordance with the DCPRS

It should be considered a positive planning application with no adverse impact on protected watercourses.