



NUTRIENT BUDGET CALCULATOR - FAQs

Frequently Asked Questions (FAQS)

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CONTENTS

1. NUTRIENT BUDGET CALCULATOR - USER FAQs	3
1.1 WHAT IS THE NUTRIENT BUDGET CALCULATOR?	3
1.2 WHAT IS A NUTRIENT BUDGET?	3
1.3 HOW DO I USE THE CALCULATOR?	3
1.4 WHAT IS REQUIRED AFTER I HAVE CALCULATED A NUTRIENT BUDGET?	3
1.5 CAN THE CALCULATOR BE USED TO EVIDENCE MITIGATION?	3
1.6 WHAT DEVELOPMENT TYPE ARE CARAVAN SITES?	3
1.7 CAN SOAKAWAYS BUILT UNDER THE BUILDING REGULATIONS BE CLASSIFIED AS SUDS?	3
2. NUTRIENT BUDGET CALCULATOR - EVIDENCE FAQs	4
2.1 WHY HAS TOTAL PHOSPHORUS BEEN USED AS THE PHOSPHORUS UNIT WITHIN THE CALCULATOR?	4
2.2 WHAT TYPES OF DEVELOPMENT CAN BE ASSESSED USING THE CALCULATOR?	4
2.3 IS CLIMATE CHANGE CONSIDERED WITHIN THE CALCULATIONS?	4
2.4 WHAT IS THE DEFAULT CONCENTRATION OF PHOSPHORUS FOR NON-PERMIT LIMITED WASTEWATER TREATMENT WORKS?	4
2.5 IS A 90% OPERATING LIMIT APPLIED TO WWTW WITH PERMITTED LIMITS OF PHOSPHORUS?	5
2.6 ARE THE DEFAULT VALUES FOR PRIVATE SEWERAGE SYSTEMS APPROPRIATE FOR WALES?	5
2.7 HAS ATMOSPHERIC NITROGEN BEEN INCLUDED WITHIN THE NITROGEN CALCULATIONS?	5
2.8 WHAT IS THE SOURCE OF THE 20% PRECAUTIONARY BUFFER?	5
2.9 HOW OFTEN ARE THE NUTRIENT BUDGET CALCULATORS UPDATED?	6
3. NUTRIENT NEUTRALITY BACKGROUND FAQs	7
3.1 WHAT IS THE DRIVER BEHIND NUTRIENT NEUTRALITY?	7
3.2 WHAT IS AN HRA?	7
3.3 WHY IS THE UK AFFECTED BY EU LAW POST-BREXIT?	7

1. NUTRIENT BUDGET CALCULATOR - USER FAQs

1.1 WHAT IS THE NUTRIENT BUDGET CALCULATOR?

The Nutrient Budget Calculator for Special Areas of Conservation (SACs) in Wales is a tool that must be used to calculate a nutrient budget for new development within the catchment of one of the nine SACs with riverine features affected by nutrient neutrality in Wales to achieve planning approval. For more information on nutrient neutrality navigate to the following link: [Principles of nutrient neutrality in relation to development or water discharge permit proposals](#).

1.2 WHAT IS A NUTRIENT BUDGET?

A nutrient budget is the result of a calculation which compares the amount of nutrients generated by the development through the generation of additional wastewater within the catchment and the net change in the amount of nutrients exported through the change in landcovers.

The nutrient budget calculator can be used to calculate a phosphorus and a nitrogen budget. However, for the purposes of securing planning permission, you only need to demonstrate that a phosphorus budget has been calculated. The budget is presented a numerical value of total phosphorus (TP) per kilogram per year (kg TP/yr).

1.3 HOW DO I USE THE CALCULATOR?

The nutrient budget calculator will first need to be downloaded from Welsh Government's website. Once downloaded, opening the calculator will launch Microsoft Excel. The calculator will automatically load to the instructions worksheet. This worksheet contains instructions on how to use the calculator. You must read the instructions before using the calculator. In addition, there is a guidance document which provides further background information and in-depth instructions on how to use the nutrient budget calculator.

1.4 WHAT IS REQUIRED AFTER I HAVE CALCULATED A NUTRIENT BUDGET?

If the nutrient budget shows there is no additional phosphorus generated (0 kg TP/year), no further action is required. However, you must submit the completed nutrient budget calculator as part of your planning application.

If the nutrient budget is a non-zero value, you must mitigate the amount of phosphorus generated by the development to achieve nutrient neutrality. Furthermore, you must provide evidence that you have secured mitigation.

1.5 CAN THE CALCULATOR BE USED TO EVIDENCE MITIGATION?

The nutrient budget calculator does not have the functionality to assist with assessing the effectiveness of mitigation measures, nor can the calculator assist with locating nutrient mitigation solutions. The nutrient budget calculator could be used to assess the net change in nutrient export following landcover change. For example, the impact of taking agricultural landcover out of production could be assessed using the nutrient budget calculator by entering the landcovers.

1.6 WHAT DEVELOPMENT TYPE ARE CARAVAN SITES?

The tourism development type should be used for caravan sites.

1.7 CAN SOAKAWAYS BUILT UNDER THE BUILDING REGULATIONS BE CLASSIFIED AS SUDS?

Soakaways built in line with the building regulations can be classified as sustainable urban drainage systems (SuDS) provided that the same level of scrutiny is applied. For example, the developer would need to demonstrate that the soil permeability has been assessed, the water table level has been measured, and that modelling has been completed to show the soakaway can withstand rainfall events of the required return periods.

2. NUTRIENT BUDGET CALCULATOR - EVIDENCE FAQs

2.1 WHY HAS TOTAL PHOSPHORUS BEEN USED AS THE PHOSPHORUS UNIT WITHIN THE CALCULATOR?

It would be useful to consider soluble reactive phosphorus (SRP) in order to provide a better representation on the sources of phosphorus that could be more likely to lead to eutrophication; SRP is more bioavailable than particulate phosphorus, for example. In addition, 'reactive P' (now defined as SRP) is the WQ parameter measured in the aquatic environment under the WFD to represent orthophosphate ions and is used to assess the ecological condition.

However, most P permit limited WwTW are limited for: 0348: Phosphorus, Total as P (mg/l). The phosphorus export coefficients for landcovers, developed through Farmscoper modelling and from literature, are in the units of TP/kg/year.

2.2 WHAT TYPES OF DEVELOPMENT CAN BE ASSESSED USING THE CALCULATOR?

The following types of development can be assessed using the tool: Residential; Commercial; Leisure; Public service infrastructure; Tourism.

Can agricultural development be assessed using the calculator?

Agricultural development cannot be assessed using the calculator. This would have required incorporating additional agricultural models within the calculator, such as the PSYCHIC model. Adding in these models was not within the project scope. Furthermore, this modelling can currently be completed within the Farmscoper tool.

2.3 IS CLIMATE CHANGE CONSIDERED WITHIN THE CALCULATIONS?

The impact of climate change on nutrient pollution has not been considered directly in the calculator. However, a 20% precautionary buffer is embedded within the nutrient budget calculation to reduce the risk of underestimating the nutrient budget.

The postcode lookup function within Stage 1 of the calculator retrieves the standard annual average rainfall for the 1990-2019 period. This was the most up-to-date rainfall data when the calculator was created.

The use of climate model projections was considered to identify estimated percentage changes in rainfall at each rainfall grid square. However, the United Kingdom Climate Model (UKCM) suggests that for the representative concentration pathway (RCP) 8.5, the most precautionary RCP from a climate change perspective, there will be a reduction in the amount of rainfall. Furthermore, the precipitation patterns may change with each modelled climate period. As such, applying climate change modelling projections may have lead to an underestimation in the amount of nutrient loading.

2.4 WHAT IS THE DEFAULT CONCENTRATION OF PHOSPHORUS FOR NON-PERMIT LIMITED WASTEWATER TREATMENT WORKS?

For wastewater treatment works (WwTW) with a dry weather flow (DWF) permitted limit of less than 20 m³/day, a default concentration of 8 mg TP/l is applied.

For wastewater treatment works (WwTW) with a DWF permitted limit that exceeds 20 m³/day, a default concentration of 5 mg TP/l is applied.

The 8 mg TP/l figure has been successfully defended in the high court by Natural England for their nutrient neutrality approach. Unpublished monitoring of WwTW with a DWF permitted limit that exceeds 20 m³/day suggests that these facilities do not exceed 5 mg TP/l.

2.5 IS A 90% OPERATING LIMIT APPLIED TO WWTW WITH PERMITTED LIMITS OF PHOSPHORUS?

Unlike the nutrient neutrality methodology in England, a 90% operating threshold of the permitted limit of a phosphorus or nitrogen is not applied to the calculations of the nutrient budgets. It was not possible within the project scope to identify if this assumption was appropriate. Therefore, it was decided that the most precautionary approach was to not apply the assumption.

2.6 ARE THE DEFAULT VALUES FOR PRIVATE SEWERAGE SYSTEMS APPROPRIATE FOR WALES?

The default concentrations are: 96.3 mg TN/l and 11.6 mg TP/l for Septic Tanks; and 72.9 mg TN/l and 9.7 mg TP/l for Package Treatment Plants. These values are based on a literature review of monitored concentrations of nutrients in the final effluent from private sewerage systems. All monitored systems are based in England. A search for literature did not return any Welsh specific monitoring studies. The values are the same as those applied by Natural England in their nutrient neutrality methodology, which has been successfully defended in the high court.

It is not within the scope of this project to monitor the concentrations of private sewerage systems in Wales. Studies show that the concentration of nutrients in the final effluent from private sewerage systems in England is extremely variable. It is unlikely that private sewerage systems in Wales will exhibit any deviation from the variation observed within England. Therefore, in lieu of a Welsh-specific study, it is assumed that the concentrations of nutrient in the final effluent from private sewerage systems in appropriate for the nutrient budget calculator for Wales.

2.7 HAS ATMOSPHERIC NITROGEN BEEN INCLUDED WITHIN THE NITROGEN CALCULATIONS?

Atmospheric nitrogen (N) has been included in the default values for landcovers. A default atmospheric deposition value of 16 kg N/ha has been assumed. This value is used as a default in the Farmscoper modelling and natural / semi-natural greenspace / woodland values. The urban export coefficients are based on event mean concentrations of observed surface runoff events which by nature include the nutrient inputs from atmospheric deposition.

2.8 WHAT IS THE SOURCE OF THE 20% PRECAUTIONARY BUFFER?

The nutrient budget calculation, and subsequent mitigation, falls under the Appropriate Assessment stage of the Habitats Regulations Assessment (HRA) process. A precautionary approach must be applied at each stage of the HRA process. Accordingly, the precautionary buffer precautionary buffer is embedded within the nutrient budget calculations to reduce the risk of underestimating the nutrient budget. Underestimating the nutrient budget could result in the potential increases in nutrient input to a SAC being higher than that removed by the nutrient mitigation measures, resulting in a net increase in the nutrients entering the SAC river environment.

The 20% precautionary buffer is applied to account for the uncertainties that underlie the inputs to Stage 1 to Stage 3 of the nutrient budget calculations, as well as accounting for some potential nutrient sources associated with new development that cannot be readily quantified. To cover all possible inputs to a nutrient budget with a high enough certainty to remove the need for the precautionary buffer would require extensive site-specific investigations. The 20% precautionary buffer is a way of accounting for the uncertainties within the nutrient budget calculations and providing confidence that mitigation of the nutrient budget will remove the risk of adverse effects on site integrity in SACs.

The 20% figure has been successfully defended in the high court by Natural England for their nutrient neutrality approach. However, it is difficult to precisely quantify uncertainty. A review of the uncertainty embedded within

the data inputs was completed for the Carmarthenshire Nutrient Budget methodology. This review found that the inputs to the nutrient budget calculation which had the most uncertainty were:

- Nutrient concentrations for non-permit limited WwTW;
- Phosphorus concentrations in package treatment plant and septic tank effluent
- Export coefficients from agricultural land
- Built environment land use export coefficients

The methodology used to generate agricultural export coefficients for this nutrient budget methodology improved on the methods used for Carmarthenshire's nutrient budget methodology. Therefore, considering the level of uncertainty was mainly the same, the use of a 20% figure, as is the case in England, is considered a sensible and precautionary value.

2.9 HOW OFTEN ARE THE NUTRIENT BUDGET CALCULATORS UPDATED?

Certain aspects of the nutrient budget calculator can be updated as information changes, for example WwTW permitted limits. However, other inputs, such as the agricultural export coefficients, require a update of the modelling. It is recommended that the calculator inputs are reviewed every 2 years, to ensure they are correct, and completely redesigned every 5 years.

3. NUTRIENT NEUTRALITY BACKGROUND FAQs

3.1 WHAT IS THE DRIVER BEHIND NUTRIENT NEUTRALITY?

Following the Court of Justice of the European Union's 2018 judgement, referred to as the "Dutch Case", Habitat Regulations Assessments (HRAs) of new development in England and Wales require local planning authorities (LPAs) to assess and mitigate the impact of additional nutrient loading on European designated sites (Designated Sites) with riverine features that are in unfavourable condition due to excessive nutrient concentrations. Should a development lead to the generation of additional nutrients, a nutrient neutrality approach is recommended, whereby mitigation is implemented to 'neutralise' the impact. Without mitigation, developments cannot achieve planning consent.

3.2 WHAT IS AN HRA?

A Habitat Regulations Assessment (HRA) is a key process within the framework established by the Habitats Regulations 2017 (Regulations 63 and 64). It ensures that any plan or project, particularly those related to land use and development, does not adversely affect the integrity of European designated sites, such as Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) which form part of the Natura 2000 network. Ramsar sites are included in the HRA process due to UK policy and planning guidelines, which treat them as equivalent to European sites for the purposes of protection. Paragraph 181 of the NPPF reinforces this policy by explicitly stating that Ramsar sites should receive the same level of protection, which includes consideration in HRAs.

Regulation 70 of the Conservation of Habitats and Species Regulations 2017 pertains to the duties of local planning authorities when granting planning permission in relation to European sites and European offshore marine sites. Regulation 70 ensures that local planning authorities fully integrate the HRA process into their decision-making when granting planning permissions. It binds them to the legal requirements established in Regulations 63 and 64, thereby ensuring that European sites are not adversely affected by development projects unless strict conditions are met. This regulation plays a crucial role in protecting the integrity of European sites.

3.3 WHY IS THE UK AFFECTED BY EU LAW POST-BREXIT?

The EU's Habitats Directive (Directive 92/43/EEC) was designed to protect habitats and species of European importance, establishing a network of protected areas known as Natura 2000 sites.

In the UK, the provisions of the Habitats Directive were implemented through the Conservation of Habitats and Species Regulations, commonly referred to as the Habitats Regulations. The 2017 version consolidated and updated previous regulations, ensuring the UK's compliance with the Directive.

The EU (Withdrawal) Act 2018 facilitated the retention of most EU laws into UK domestic law when the UK left the European Union, ensuring legal continuity. This included the Habitats Directive (Directive 92/43/EEC) and related environmental protections.

Following Brexit, the Habitats Regulations 2017 have been retained in UK law, but the government has the ability to amend or diverge from these regulations as necessary. The core principles of habitat protection and species conservation, however, remain grounded in the framework initially established by the EU's Habitats Directive.



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