

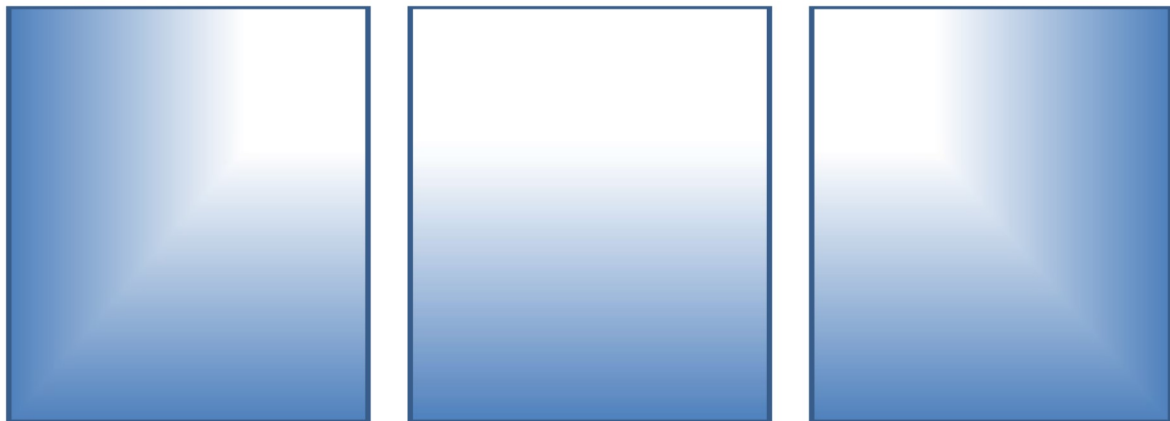
# HalpinRobbins

Ecology & Environmental Services

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## Nutrient Neutrality Assessment and Mitigation Strategy

Creation of a 10-pitch campsite at Holly Farm, Alston, Axminster, Devon



**Project No. and Report Ref.:** 02.133.001.01\_Holly Farm\_NNAMS

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## REVISION AND AMENDMENT REGISTER

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2	Update of nutrient budget calculation with source references	B Rigg	A Robbins	16-Feb-24

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## 1 OVERVIEW

HalpinRobbins Limited was commissioned to compile and supply a Nutrient Neutrality Assessment and Mitigation Strategy for the creation of a 10-pitch campsite at Holly Farm, Alston, Axminster, Devon EX13 7LG. Application to be submitted to East Devon District Council.

### 1.1 *Planning Validation*

In accordance with the East Devon District Council planning checklist if a development is within the catchment of an “Ecological Nature Network” site that is deteriorating due to increased nutrient loads within its catchment the development may require a Habitats Regulations Assessment and the planning application submission is required to demonstrate how the development achieves nutrient neutrality to comply with The Conservation of Habitats and Species Regulations 2017 and The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019.

The Ecological Nature Networks sites are Special Protection Area, Special Area of Conservation and Ramsar sites.

In Devon the following sites and catchments are recognised as being affected:

- River Axe Special Area of Conservation – Phosphorus

If the development is assessed as likely to create an increased phosphorus loading within the catchment of any Ecological Nature Networks sites, a complete mitigation package is required to be submitted.

#### 1.1.1 *Calculators*

##### **Natural England Calculator**

In March 2022 Natural England released a generic phosphorus calculator for the river Axe catchment, based upon the calculator developed for consideration of the Stodmarsh designated sites, published in November 2020.

The calculator is a broad approach tool and is not meant for detailed assessment but to provide a guide.

##### **Farmscoper**

Natural England approved Farmscoper as a suitable calculator to use when considering farmland and operations.

Farmscoper is a decision support tool that can be used to assess diffuse agricultural pollutant loads on a farm and quantify the impacts of farm mitigation methods on these pollutants.

The farm systems within the tool can be customised to reflect management and environmental conditions representative of farming across England and Wales. The tool contains over 100 mitigation methods, including many of those in the latest Defra Mitigation Method User Guide.

Farmscoper was originally developed under Defra project WQ0106. It was expanded under Defra Project SCF0104 to include additional pollutants and new workbooks.

Farmscoper is only suitable for considerations on land and does not have capacity to assess buildings or hard landscapes.

## 1.1.2 *Technical Updates and Guidance*

Since the commencement of nutrient neutrality works in Devon, several guidance documents and updates have been issued by Natural England.

This assessment is based upon the following:

- Sustainable Urban Drainage Systems (SuDS)
- Package Treatment Plants and Septic Tanks Advice Note (September 2022)
- Nutrient Neutrality Mitigation Statement guidance
- Phosphate Shadow HRA: Project Level Appropriate Assessment Template
- Discharge of Conditions Guidance
- Phosphates Agents Forum Presentation (December 2020)
- Natural England SSSI Condition Briefing Note (May 2021)
- River Axe SAC – Evidence Pack
- Water Quality and Nutrient Neutrality Advice (March 2022)
- Nutrient Neutrality Principles (February 2022)
- Nutrient Neutrality - A Summary Guide (March 2022)
- Natural England Generic Nutrient Neutrality Methodology (February 2022)
- Natural England Generic Catchment Calculator (March 2022)
- River Axe Catchment Map (March 2021)

### **Assessment**

For the purpose of this report the values and calculations within the Natural England River Axe Nutrient Budget Calculator have been used where possible. For matters that do not fit under the calculator alternative scientific research and reports have been source, reviewed and utilised to determine phosphorus levels and loads.

## 2 PROPOSAL

The application site comprises an area of mixed agricultural land currently used for various agricultural practices on the smallholding. The site is c.1.5 hectares (ha) in size and is surrounded by agricultural fields.

The proposal will create a 10-pitch campsite within a broadleaf woodland.

**Figure 1. Site Location**



### **Land Classification**

The site and its current use were assessed under the land classification types defined within the Natural England River Axe Nutrient Budget Calculator. Due to operation and location the site is classified as “Mixed Agricultural”.

The site and its proposed use were assessed under the land classification types defined within the Natural England River Axe Nutrient Budget Calculator. Due to the planting of a broadleaf woodland, the site will be classified as “Woodland”.

### **Wastewater**

There is currently no wastewater discharge from the site.

The site when operational will separate solid and liquid waste. Liquid waste will be discharged to a soakaway whilst the solid waste will be collected and composted. This will then be used in place of fertiliser on the applicant’s onsite orchard.

### **3 NUTRIENT BUDGET**

#### **3.1 Requirement**

The development is within the catchment of the River Axe Special Area of Conservation and therefore requires consideration for nutrient neutrality; phosphorus. See Appendix A for catchment map.

#### **3.2 Phosphorus Load Calculation**

The nutrient budget for the Land use change of the development has been calculated using the Natural England River Axe Nutrient Budget Calculator.

As the site will be operating a system that collects and separates out the liquid and solid wastes from the camp usage, discharging the liquid waste to ground and using the solid waste for compost an alternative nutrient calculation has been utilised.

##### **3.2.1 Occupancy Rates**

The Natural England River Axe Nutrient Budget Calculator does not have the capacity to calculate nutrient loading from campsites or activities that are time limited.

Current occupancy rate of campsites in the UK is variable depending on many factors including, but not limited to location, facilities, weather, date and services. For this calculation multiple sources of information were consulted and verified. Of all the information reviewed that deemed most reliable and accurate was the UK Caravan and Camping Alliance<sup>1</sup>.

From the information gathered the relevant occupancy information was concluded:

- The highest occupancy rates were achieved in May and August; c.70%
- Mid-season occupancy rates, c.55%, were achieved in June, July and September
- October to April occupancy rates were less than 10%
- Most campers stayed for 3 days.
- Average length of stay is 4 nights.
- The average number of adults per pitch was 2.2.

To provide confidence in the assessment the maximum occupancy rate of 70% has been used for the calculation and occupancy of each tent pitch has been set at 2.2, based on average occupancy produced by UK Caravan and Camping Alliance.

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<sup>1</sup> UK Caravan and Camping Alliance (2019). Economic Benefit Report: Holiday Parks and Campsites.



## 3.2.2 Phosphorus from Wastewater Water Usage

The campsite has both showers and composting toilets on site. For the nutrient calculations have been based on the following information and sources.

### Showers

- Usage: 1 shower per person per day
- Water: 40litres per use (British Flows and Loads)
- Phosphorus Concentration: 6mg/l<sup>2</sup>

### Calculation

2.2 people per tent x 10 tents x 70% occupancy x 40ltrs x 6mg/l x 60 days =  
221,760 mg or 0.22kg

### Composting Toilets

#### Urine

- Usage: 5 visits per person per day
- Water: 400ml per visit (NHS Bladder volume)
- Phosphorus Concentration: 1.4mmol - 43.4mg/l (NHS Foundation Trust)<sup>3</sup>

### Calculation

2.2 people per tent x 10 tents x 70% occupancy x 5 visits x 0.4ltrs x 43.4mg/l x 60 days =  
80,203mg or 0.08kg

#### Faeces

- Usage: 1.2 visits per person per day  
(National Institute of Health)
- Phosphorus Concentration: 0.5g per visit (Royal Society of Chemistry)<sup>4</sup>

### Calculation

2.2 people per tent x 10 tents x 70% occupancy x 1.2 visits x 0.5g x 60 days =  
554.4g or 0.55kg

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<sup>2</sup> Phosphorous removal and recovery from urban wastewater: Current practices and new directions, Di Capua et al 2022.

<sup>3</sup> Reference ranges (2024) Phosphate 0.74 – 1.4 mmol/l, equal to 12.9 – 42.0 mmol/24 hours

<sup>4</sup> Phosphorus Recovery from Wastewater. S Petzet et al, 2013.

## Washing up

Phosphate residues are known to cause nausea, diarrhoea and skin irritations and the use of phosphates in washing up is illegal in the UK. Therefore, no calculation has been provided for washing up.

## Total Phosphorus from activities

Although the site will be using the solids from composting toilets as an alternative fertiliser, the total phosphorus content of the faeces has been included in the development's nutrient budget, rather than reducing it to take account of the fertiliser replacement or bound nutrients. This follows the precautionary approach favoured by Natural England.

• Showers	0.22 kgP/yr <sup>5</sup>
• Composting Toilets (urine)	0.08 kgP/yr
• Composting Toilets (faeces)	0.55 kgP/yr
• <b>Total</b>	<b>0.85 kgP/yr</b>
• <b>Total with 20% precautionary buffer</b>	<b>1.02 kgP/yr</b>

### 3.2.3 *Phosphorus from Land Use Change.*

For the purpose land use change the River Axe calculator was used. The following details have been utilised:

• Area of development site:	1.5 hectares (ha)
• Current site use:	Mixed Agricultural – 1.50ha
• Proposed site use:	Woodland – 1.50ha
• Catchment:	River Axe
• Soil type:	Slightly acid loamy and clayey soils with impeded drainage
• Annual average rainfall (mm):	1159.2
• Within Nitrate Vulnerable Zone:	No

The results of the calculator are as follows:

• Phosphorus load from current use:	2.19 kgP/yr
• Phosphorus load from proposed use:	0.03 kgP/yr
• Phosphorus load from land use change:	-2.16 kgP/yr

See Appendix B for the Natural England River Axe Nutrient Budget Calculator

<sup>5</sup> KgP/yr – Kilogram of phosphorus per year.

### 3.3 *Phosphorus Budget Conclusion*

The development will result in an environmental betterment of 1.14kgP/yr (1.02 - 2.16) into the catchment of the River Axe Special Area of Conservation.

This development creates an environmental betterment within the catchment and therefore, has no requirement for mitigation.

5 APPENDICES

5.1 Appendix A – River Axe Catchment Map



European protected sites requiring nutrient neutrality strategic solutions

Scale: 1:120,000

Component SSSIs of River Axe SAC

- ▭ Local Authorities
- ▭ SSSI subject to nutrient neutrality strategy
- ▭ Nutrient neutrality SSSI catchment
- ▭ National Parks

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## 5.2 Appendix B – River Axe Nutrient Budget Calculator Summary

### Stage 2

**User Inputs**

Catchment:	Lim and Axe
Soil drainage type:	Impeded drainage
Annual average rainfall (mm):	1,100.1 - 1,200
Within Nitrate Vulnerable Zone (NVZ):	No

Existing land use type(s)	Area (ha)	Annual phosphorus nutrient export (kg TP)
Mixed	1.50	2.19
<b>Total:</b>	<b>1.5</b>	<b>2.19</b>

### Stage 3

**User Inputs**

New land use type(s)	Area (ha)	Annual phosphorus nutrient export (kg TP)
Woodland	1.50	0.03
<b>Total:</b>	<b>1.5</b>	<b>0.03</b>