



Nutrient Neutrality

Land Adjoining 4 Brookfields,
Providence Hill, Bursledon

Ecosupport Ltd
K4 Keppel,
Daedalus Park,
Lee-on-the-Solent
PO13 9FX

info@ecosupport.co.uk

VAT: 228 4314 18



Report	Nitrogen Budget Calculation
Site Name	Land Adjoining 4 Brookfields, Providence Hill, Bursledon
Author(s)	Louise Davies BSc (Hons)
Client	Colten Care Ltd.
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Executive Summary

Ecosupport Ltd. was instructed by Colten Care Ltd. in April 2024 to conduct a Nitrogen Budget Calculation for the development at the Land Adjoining 4 Brookfields, Providence Hill in Bursledon. This assessment calculates the change in nitrogen outputs from the existing site to the future proposed 73 bed care home with 5 No. bedroom age restricted cottages, parking access and landscaping.

Using the standard Natural England methodology, it was calculated that the site will result in an increased nitrogen load of **24.26kg/TN/year** and will therefore require mitigation.

Recommendations for mitigation are outlined within **Section 4.0** of this document. Mitigation must be agreed with the local authority to be considered acceptable.

1.0 INTRODUCTION

1.1 Brief

Ecosupport Ltd. was instructed by Colten Care Ltd. in April 2024 to conduct a Nitrogen Budget Calculation for the development at the Land Adjoining 4 Brookfields, Providence Hill in Bursledon. Due to the site's location within the Solent Catchment Area, it will require nitrogen neutrality to ensure the development will not result in an increased nitrogen load into the Solent's sensitive and designated areas.

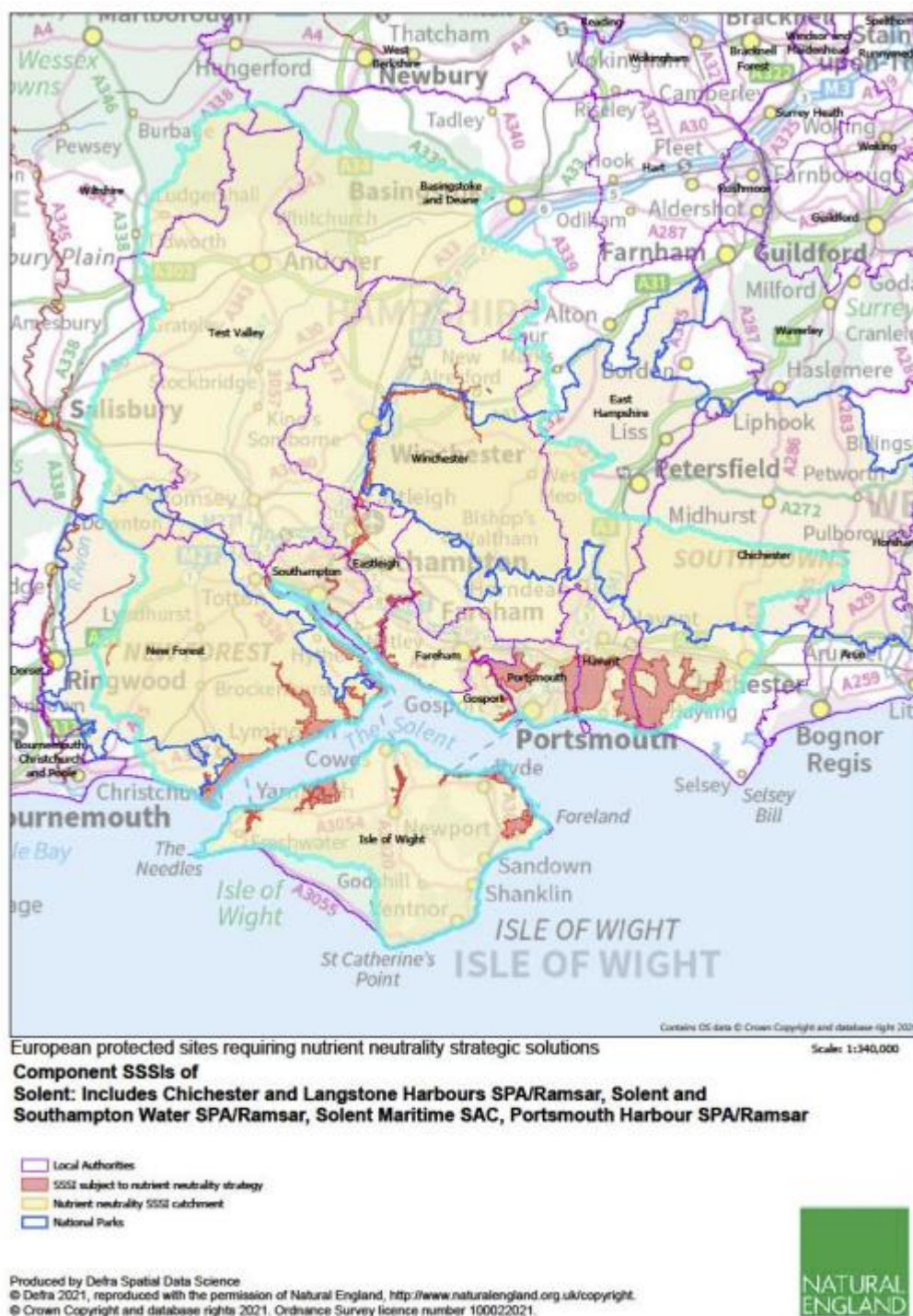
The purpose of this calculation was to determine the change in nitrogen load resulting from a net increase in dwellings within the site as a result of the development.

1.2 Background

The Conservation of Habitats and Species Regulations (2019) transposes the EU Habitats Directive (Council Directive 92/43/EEC) into UK domestic law and provides protection for sites and species deemed to be of conservation importance across Europe. Under Regulation 63 competent authorities must undertake an "Appropriate Assessment" to assess whether proposed actions may have a significant effect on a European protected site.

In 2018 and 2019, Natural England undertook a number of condition assessments on designated sites around the Solent including the Solent Maritime Special Area of Conservation (SAC), Chichester and Langstone Harbours Special Protection Area (SPA), Portsmouth Harbour SPA and Solent and Southampton Water SPA and associated Sites of Special Scientific Interest (SSSI). The assessment found that many of the designated sites were in unfavourable and/or declining conditions due to existing levels of nutrients and held the view that increased wastewater from new developments would have a likely significant effect on the internationally designated sites. Natural England advised councils within the watersheds leading to the designated sites (**Fig 1**) that any new development resulting in an increase in overnight stays should achieve nutrient neutrality in order to not have any significant effects. Natural England developed a nitrogen budget methodology to calculate the nitrogen output of a development using a precautionary approach. All developments that will result in a net increase in dwellings or overnight stays (e.g. hotels, student accommodation, nursing homes) will require a nitrogen budget calculation using this method. Any sites resulting in an increase in nitrogen loading will require mitigation prior to planning approval, or site occupancy, where Grampian conditions are permitted to achieve planning approval.

Figure 1. Solent Catchment Area map (taken from Natural England, 2022a).



1.3 Site Location

The site comprises a parcel of land and associated outbuildings to the north of Providence Hill, Bursledon, SO31 8AU (centred on OS grid reference SU 48308 10626) (**Fig 2**). The site is bound by the A27 to the south with residential housing areas lying to the north, east and west. The immediate surrounding environ can be considered largely urban comprising mostly of residential dwellings and their gardens however some small pockets of woodland and grassland are present to the north of the site.

Figure 2. Site boundary (Google Satellite, 2024).



1.4 Current Land Use

The total area of site is 1.09ha in size. The existing land use comprises a mix of Greenspace, Shrub and Residential Urban Land (see **Appendix A**).

1.5 Proposed Development & Land Use

The proposals entail the erection of a Residential Care Community, comprising a 73 bed care home (Use Class C2) and 5 x close care cottages (Use Class C2) with associated access, internal access roads, parking, landscaping and infrastructure. The post-development land use comprises Residential Urban Land throughout the core area of the development with Shrub and Greenspace present within ecological buffers and semi-natural areas around the boundaries of the site (see **Appendix B**).

2.0 METHODOLOGY

2.1 Calculation

2.1.1 Overview

The methodology for the assessment of the net change in nitrogen to the Solent catchment is based on the updated Natural England advice on achieving nutrient neutrality (Natural England & DEFRA, 2024a), the Nutrient Neutrality Generic Methodology (Natural England, 2022b) and the associated published *Nitrogen Budget Calculator Version 3* (Natural England, 2024b). As recommended, only the expected area to be impacted for change in land use is calculated. There are four stages to the calculation (with an additional optional stage in which information about the SuDs features on the site can be entered however this was not required for this development).

2.1.2 Stage 1

Stage 1 calculates the new nutrient load associated with the additional wastewater that would exit the wastewater treatment works (WwTW) into the Solent. It allows entering the average household size for which the default setting is the national occupancy rate of 2.4 people per dwelling/unit and it is assumed that the water use is 120L/day per person. In addition, it assumes a 90% discharge of the total nitrogen permit limit of the WwTW. In the case a WwTW does not have a permit limit, a worst-case scenario of 27mg/L is used.

For this development, the average occupancy has been changed from 2.4 persons per dwelling/unit to 0.9 persons per dwelling/unit. The default average was not considered appropriate for a care home where individual rooms are provided to residents on a single bed basis with communal facilities and where approximately 10% voids are attributed to resident deaths, room refurbishments and room unoccupancy (care homes do not operate at 100% occupation). Therefore, the below approach has been taken to establish the number of units and provide a more appropriate and accurate occupancy rate of 0.9 persons per dwelling/unit.

The main care home will provide 73 single occupancy rooms (or 73 units). There will also be 5 No. 2-bedroom age restricted cottages on site which would be occupied by a maximum of 2 persons. This is based on average occupation at other Colten locations, or where a couple may have a spouse in the care home and be living alone in the cottage. For the purposes of establishing an accurate occupancy rate, these cottages are considered to provide 10 units. Therefore, it is considered that, at any one time, there is expected to be 90% occupancy across the 83 single person units on site.

Furthermore, water consumption has been reduced to 110 l/person to reflect higher standards of water efficiency and building regulation requirements for this particular site.

2.1.3 Stages 2-4

Stage 2 calculates the existing nitrogen load from current land use based on set average nitrogen loss rates from type of land use. In this section some environmental information about the development is also entered as well as the type(s) and area(s) of landcover on the development site. Stage 3 similarly calculates the annual nitrogen load from the proposed land use based on the proposed site plan.

Stage 4 calculates the net change in nutrient loading for the site and the final annual nutrient budget for the development site. The value(s) shown are how much nutrient mitigation is required in kilograms per year to achieve nutrient neutrality. A precautionary buffer of 20% is built into the calculation.

3.0 RESULTS

3.1 Nitrogen Budget

The proposed development will result in **24.26kg of Total Nitrogen per year**. See **Table 1** below for full details.

Table 1. Nitrogen Budget Calculation using Natural England (2024) calculator.

Water infrastructure information	
Description of required information	Data entry column - user inputs required
Date of first occupancy (dd/mm/yyyy):	09/04/2026
Average occupancy rate (people/dwelling or people/unit):	0.90
Water usage (litres/person/day):	110
Development proposal (dwellings/units):	83
Include deductible acceptable loading?	Yes
Wastewater treatment works:	Peel Common WwTW
Current wastewater treatment works N permit (mg TN/litre):	7.00
Not applicable	Not applicable
Not applicable	Not applicable
Final calculation of nutrient load from wastewater	
Description of values generated	Values generated
Wastewater nutrient loading	
Additional population (people):	74.70
Wastewater by development (litres/day):	8217.00
Annual wastewater TN load (kg TN/yr):	18.91
Not applicable	
Not applicable	Not applicable
Not applicable	
Not applicable	Not applicable

Current land use information	
Description of required information	Data entry column - user inputs required
Operational catchment:	East Hampshire Rivers
Soil drainage type:	Impeded drainage
Annual average rainfall (mm):	850.1 - 900
Within nitrate vulnerable zone (NVZ):	Yes

Current land uses		
Existing land use type(s) - user inputs required	Area (ha) - user inputs required	Annual nitrogen nutrient export (kg TN/yr)
Shrub	0.41	1.22
Greenspace	0.11	0.32
Residential urban land	0.58	9.39
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
Totals:	1.09	10.94

Future land uses		
New land use type(s) - user inputs required	Area (ha) - user inputs required	Annual nitrogen nutrient export (kg TN/yr)
Shrub	0.20	0.60
Residential urban land	0.67	10.99
Greenspace	0.22	0.65
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
		0.00
Totals:	1.09	12.24

Total nutrient budget calculations	
Description of values generated	Values generated
Wastewater TN load (kg TN/year):	18.91
Net land use TN change (kg TN/year):	1.30
TN budget:	20.21
TN budget + 20% buffer:	24.26
Annual nutrient budget	
The total annual nitrogen load to mitigate is (kg TN/yr):	24.26
Not applicable	
Not applicable	Not applicable
Not applicable	
Not applicable	Not applicable

4.0 MITIGATION

While measures have been taken on site to avoid an increase in nutrient loading through the provision of extensive ecological buffers and open spaces supporting habitats with low nutrient outputs, it was not possible to entirely prevent an increase in nitrogen load. This is predominantly due to the existing habitat types on site comprising largely of Shrub and Greenspace which are of low nutrient output to begin with.

Given that there was insufficient space to offset the increased nitrogen load on site, mitigation will need to be sought through credit schemes. Within Eastleigh Borough, the council offers its own nutrient offsetting scheme, managing *“over 238 hectares of mitigation land, totalling 11,354 credits”* (Eastleigh Borough Council, 2024).

Therefore, to mitigate for the increased nitrogen load of 24.26 kg/TN/yr, nutrient credits will be purchased from the Eastleigh Borough Council nutrient offset scheme: <https://www.eastleigh.gov.uk/business/developers-how-to-unlock-your-development>

To secure mitigation, Colten Care Ltd. will (when requested) provide evidence to the Local Planning Authority that mitigation has been secured through a “Notice of Purchase”, “Allocation Agreement” or similar agreement.

5.0 CONCLUSION

Ecosupport Ltd. was instructed by Colten Care Ltd. to conduct a Nitrogen Budget Calculation for the development at the Land Adjoining 4 Brookfields, Providence Hill, Bursledon. Using the standard Natural England methodology, it was calculated that the site will result in an increased nitrogen load of **24.26kg/TN/year** and will therefore require mitigation. As detailed in **Section 4.0** of this document, mitigation will be provided through the purchase of nutrient credits from Eastleigh Borough Council. Mitigation must be agreed with the local planning authority to be considered acceptable.

6.0 REFERENCES

Eastleigh Borough Council (2024) *Unlocking development across the Solent*. Available at:
<https://www.eastleigh.gov.uk/business/developers-how-to-unlock-your-development>

HMSO (2019) *The Conservation of Habitats and Species Regulations*. Statutory Instrument 2019 No. 579. HMSO, London.

Natural England (2022a) *The Solent – Catchment Map*. – August 2022.

Natural England (2022b) *Nutrient Neutrality Generic Methodology (NECR459)*. – November 2022.

Natural England & DEFRA (2024a) *Using the nutrient neutrality calculators*. Available at:
<https://www.gov.uk/guidance/using-the-nutrient-neutrality-calculators>

Natural England (2024b) *Nitrogen Budget Calculator Version 3*.



Legend

— Site Boundary

Greenspace - 0.106ha

Residential urban land - 0.576ha

Shrub - 0.408ha

Total: 1.09ha



K4 Keppel, Daedalus Park
Daedalus Drive
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E: info@ecosupport.co.uk
T: 01329 832 841

Map	Appendix A - Current Land Use
Site	Land Adjoining 4 Brookfields
Client	Colten Care Ltd.
Date	12/04/2024
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Legend

Site Boundary

Greenspace - 0.201ha

Residential Urban Land - 0.674ha

Shrub - 0.215ha

Total: 1.09ha



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Map Appendix B - Future Land Use

Site Land Adjoining 4 Brookfields

Client Colten Care Ltd.

Date 12/04/2024

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