NUTRIENT NEUTRAL ASSESSMENT & MITIGATION STRATEGY

Report Ref: NNAMS/401

Author: Simon Longworth BSc – Environmental Consultant

Reviewer: Sarah Belton MSci MSc – Director & Hydrologist / Hydrogeologist

Version	Date	Issued to
Revision R1	22-May-2024	Hume Planning Consultancy Ltd

A: Unit C, Howle Manor Business Park, Howle, Newport, TF10 8AY

T: 07535 405031

E: contact@nutrientneutral.com

Company Reg. No.: 13287512

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1 Introduction

Nutrient Neutral Ltd has been commissioned by Hume Planning Consultancy Ltd to undertake a Nutrient Neutrality and Mitigation Strategy (NNAMS) for the proposed development of four residential dwellings together with access, parking, and landscaping at land rear of Barnstormers, Stone Street, Stanford, Kent, TN25 6DF.

A previous planning application for this development was submitted to Folkestone & Hythe District Council (Planning ref: 21/1142/FH) and a subsequent appeal dismissed on 31st August 2023, one such justification for this dismissal being the potential adverse impacts of the proposed development to the Stodmarsh SAC Conservation Objectives. This Report supports a revised planning application (Planning ref: 23/1925/FH), which is currently under consideration by the Local Planning Authority (LPA).

The conservation status of the Stodmarsh is currently 'unfavourable' because it is suffering from eutrophication due to excessive nitrogen and phosphorus levels in water draining into the lakes from the River Stour. Wastewater from the proposed development would drain to the Sellindge Wastewater Treatment Works (STW), which discharges to the River Stour.

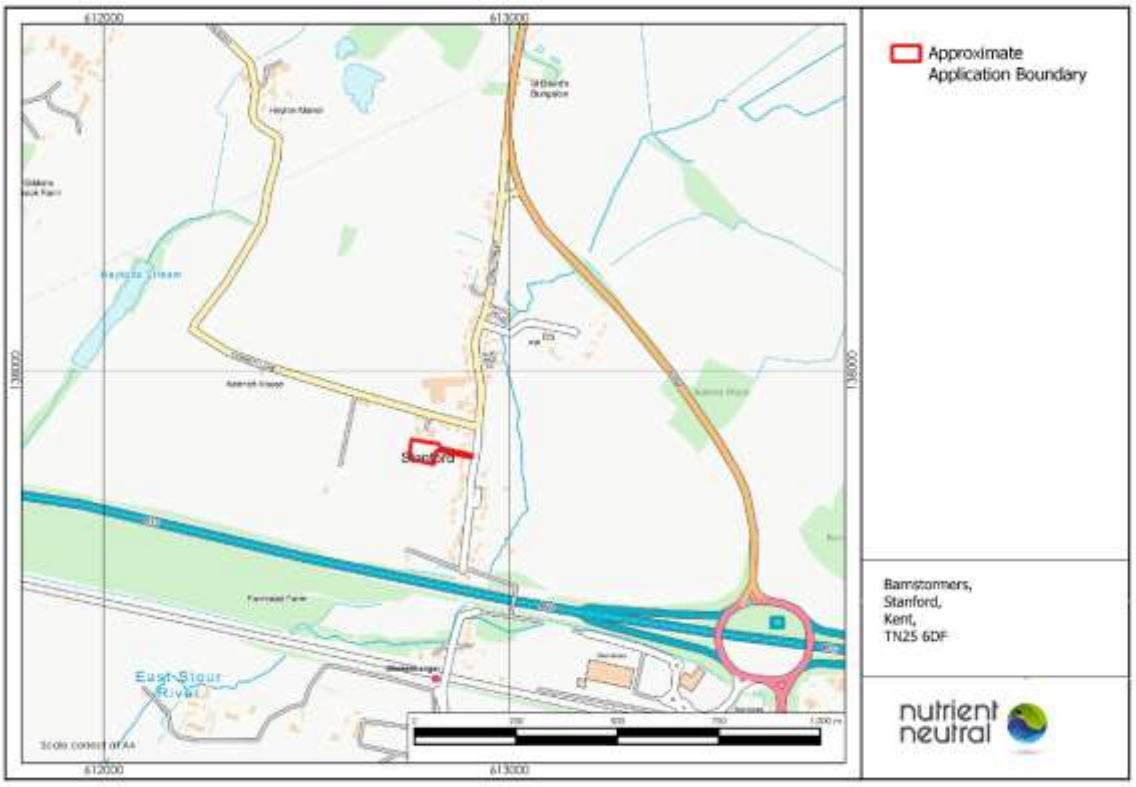
The phosphorus and nitrogen load generated by the proposed development has been calculated according to the Natural England Nutrient Neutrality Budget Calculator for the Stodmarsh SAC and Ramsar (V3).

1.1 Site characteristics

1.1.1 Site location

The proposed development site is located within the village of Stanford, on a 0.40ha parcel of land to the rear of the Barnstormers property, which is currently used as an extended garden. The red line application boundary incudes an access trackway adjoining Stone Street on the eastern boundary. The site is centred around National Grid Reference (NGR) TR 12816 37799.

Drawing 401/NNAMS/D1: Site location



1.1.2 Topography

The site is located within undulating lowland terrain, with the proposed development site averaging 76m Above Ordnance Datum (m AOD). The local topography of the surrounding areas decreases eastwards to the channel of the East Stour River, approximately 125m east of the red line application boundary for the proposed development.

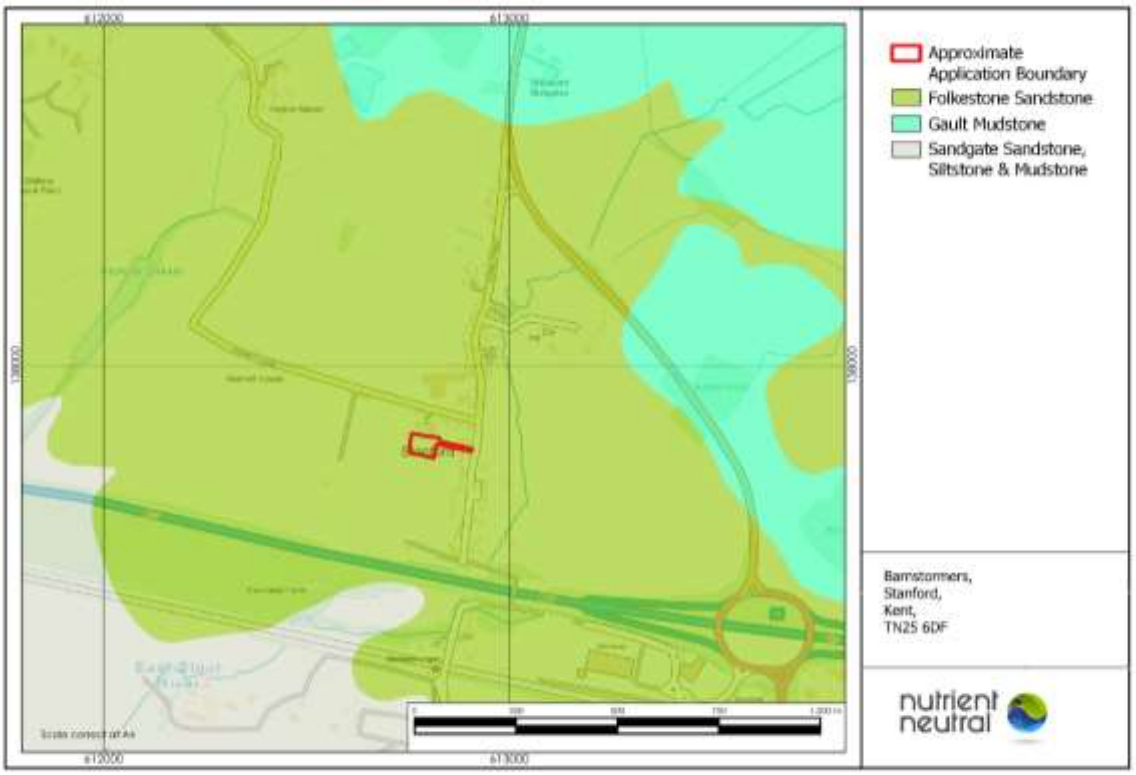
1.1.3 Geology & Hydrogeology

The bedrock geology at the proposed site is uniform and comprises Folkestone Formation (sandstone) (401/NNAMS/D2). Superficial deposits comprise Head (clay and silt) in the immediate site area (401/NNAMS/D3).

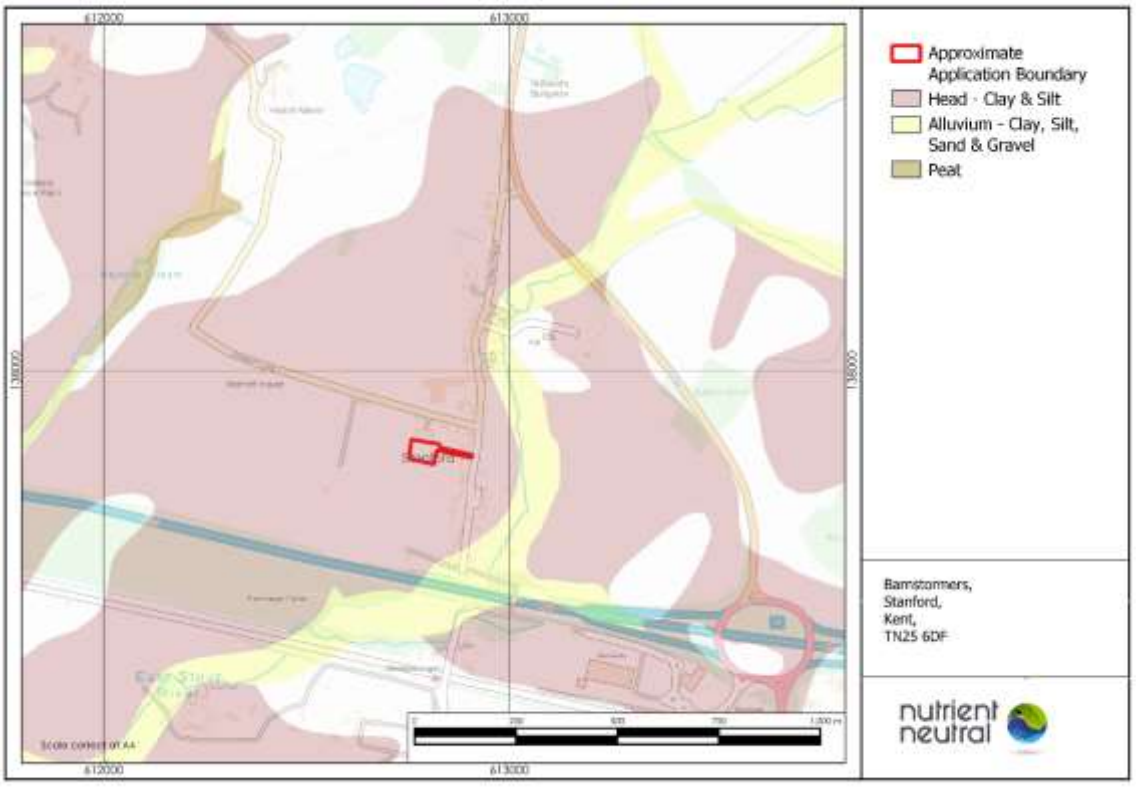
The underlying geology in the area is classified as having 'Medium - High' groundwater vulnerability (MAGIC DEFRA).

The site is located within a Nitrate Vulnerable Zone (NVZ) 2017 Designation for surface water (River Great Stour). (MAGIC DEFRA).

Drawing 401/NNAMS/D2: Bedrock geology



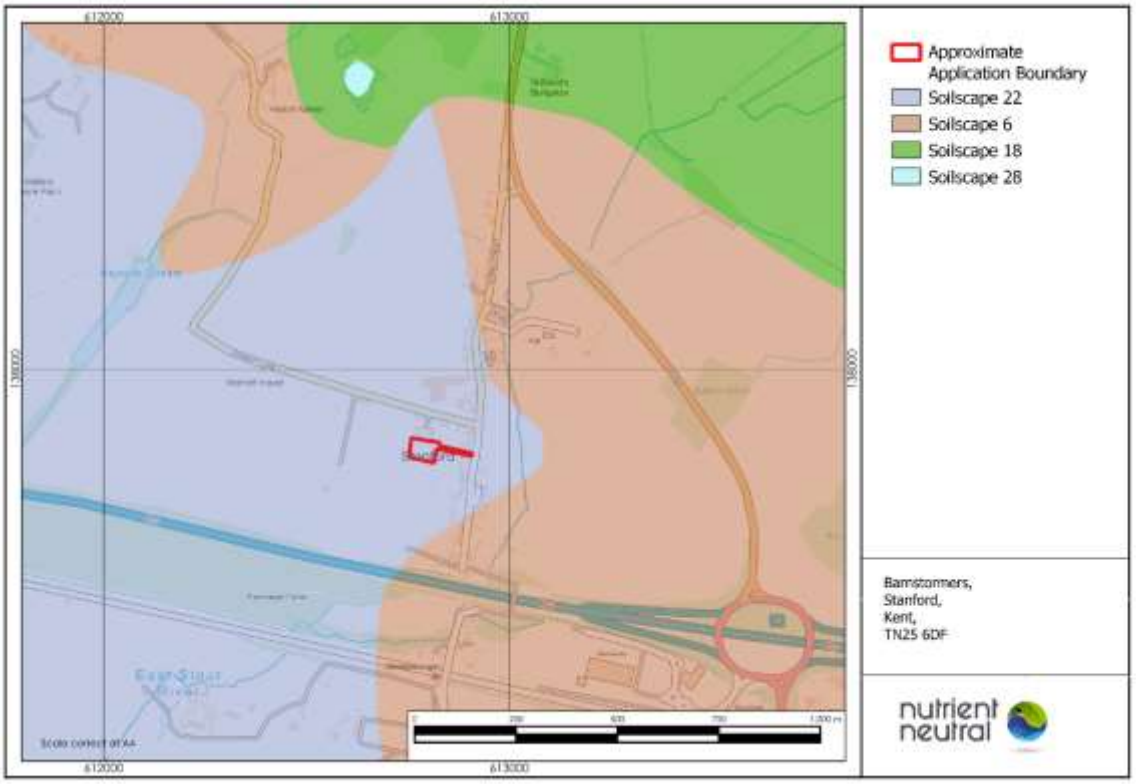
Drawing 401/NNAMS/D3: Superficial deposits



1.1.4 Soils

Based on the Cranfield University Soilscapes webtool (http://www.landis.org.uk/soilscapes), the soils under the site are uniform and comprise Soilscape 22 which are loamy soils with naturally high groundwater. This type of soil mostly drains into shallow groundwater and marginal field ditches; thus the local water resources are vulnerable to pollution from nutrients, pesticides and wastes applied to the land.

Drawing 401/NNAMS/D4: Soils at the site



1.1.5 Hydrology

The proposed development site is located within the Stour Upper Operational Catchment, which forms part of the Stour Management Catchment. The nearest watercourse is the East Stour River, approximately 125m east of the red line application boundary adjoining Stone Street. The East Stour flows southwards for approximately 600m, then flows broadly north-westwards, to its confluence with the Great Stour at Ashford, 12.5km northwest of the site NGR TR 01601 42850.

1.1.6 Rainfall

The 1961-1990 annual rainfall was sourced from the National River Flow Archive, using the nearest catchment water monitoring station (40023 - East Stour at South Willesborough); indicated to be in the range of 750-800mm/yr (https://nrfa.ceh.ac.uk/data/search).

2 Calculation of nutrient export from proposed development

Phosphorus and nitrogen calculations have been undertaken in accordance with the Stodmarsh SAC and Ramsar nutrient budget calculator V3 (Natural England). Full calculation sheets are attached (**Appendix 2**), and the pertinent information summarised below.

2.1 Proposed development

The proposed development comprises the erection of four residential dwellings. An average occupancy rate of 2.4 persons per residential dwelling has been used for this calculation, and a daily water usage (litres per person per day) of 120 l/p/d has been utilised in accordance with prescribed values in the Stodmarsh SAC and Ramsar nutrient budget calculator V3 (Natural England). Thus, this development will increase the local population by 9.6 persons: in total generating an additional 1,152 litres per day.

2.2 Calculation of wastewater load

The development site is located within a sewered area, served by Sellindge Wastewater Treatment Works (WWT). At the time of this report, Sellindge WWT has a phosphorus discharge limit of 1mg TP/litre, and a nitrogen discharge limit of 27mg TN/litre.

In accordance with the Levelling-Up and Regeneration Act (LURA), wastewater treatment works must achieve the technically achievable limits (TAL) for phosphorus and nitrogen discharge concentrations by 2030. Sellindge WWT will be upgraded in 2025, and therefore phosphorus discharge concentrations will decrease to 0.5mg TP/l. post-2030, discharge concentrations will decrease to 0.25mg TP/l and 10mg TN/l.

It is expected that the proposed four dwellings for this development will not be occupied until post-2025. Thus, for the purposes of this assessment, we have utilised the post-2025 and post 2030 discharge concentrations. Based on these values, the post-2025 wastewater export for the proposed development is calculated at **0.19kg/TP/yr** and **11.36kg/TN/yr,** and the post-2030 export is calculated at **0.11kg/TP/yr and 4.55kg/Tp/yr.** The pertinent calculations can be seen in Table 1 below.

2.3 Land use change

2.3.1 Pre-Development

The 0.40ha parcel of land is best described as residential curtilage, and therefore technically classified as residential land. Stage 2 of the Stodmarsh SAC and Ramsar nutrient budget

calculator has been utilised to assess the pre-development phosphorus and nitrogen export associated with 0.40ha of residential land; calculated to be **0.62kg TP/yr** and **5.78kg TN/yr.**

2.3.1 Post-Development

Stage 3 of the Stodmarsh SAC and Ramsar nutrient budget calculator has been utilised to assess the post-development phosphorus and nitrogen export associated with the 0.40ha parcel of land, which will continue to be used as residential land. This has an associated nutrient export of **0.62 kg TP/yr** and **5.78kg TN/yr.** As the land use will not change, there is no change in nutrient export from the site**.**

3 Summary of phosphorus balance for this development

401/NNAMS/T1: Nutrient budget				
Description	**Post-2025 Phosphorus Value (kg TP/yr)**	**Post-2025 Nitrogen Value (kg TN/yr)**	**Post-2030 Phosphorus Value (kg TP/yr)**	**Post-2030 Nitrogen Value (kg TN/yr)**
TP wastewater, post-treatment	0.19	11.36	0.09	3.79
Pre-development land use	0.62	5.78	0.62	5.78
Post-development site loss	0.62	5.78	0.62	5.78
Land use net change	0	0	0	0
Phosphorus budget	0.19	11.36	0.09	3.79
20% buffer	0.04	2.27	0.02	0.76
Phosphorus budget + 20% buffer	**0.23**	**13.63**	**0.11**	**4.55**

4 Mitigation

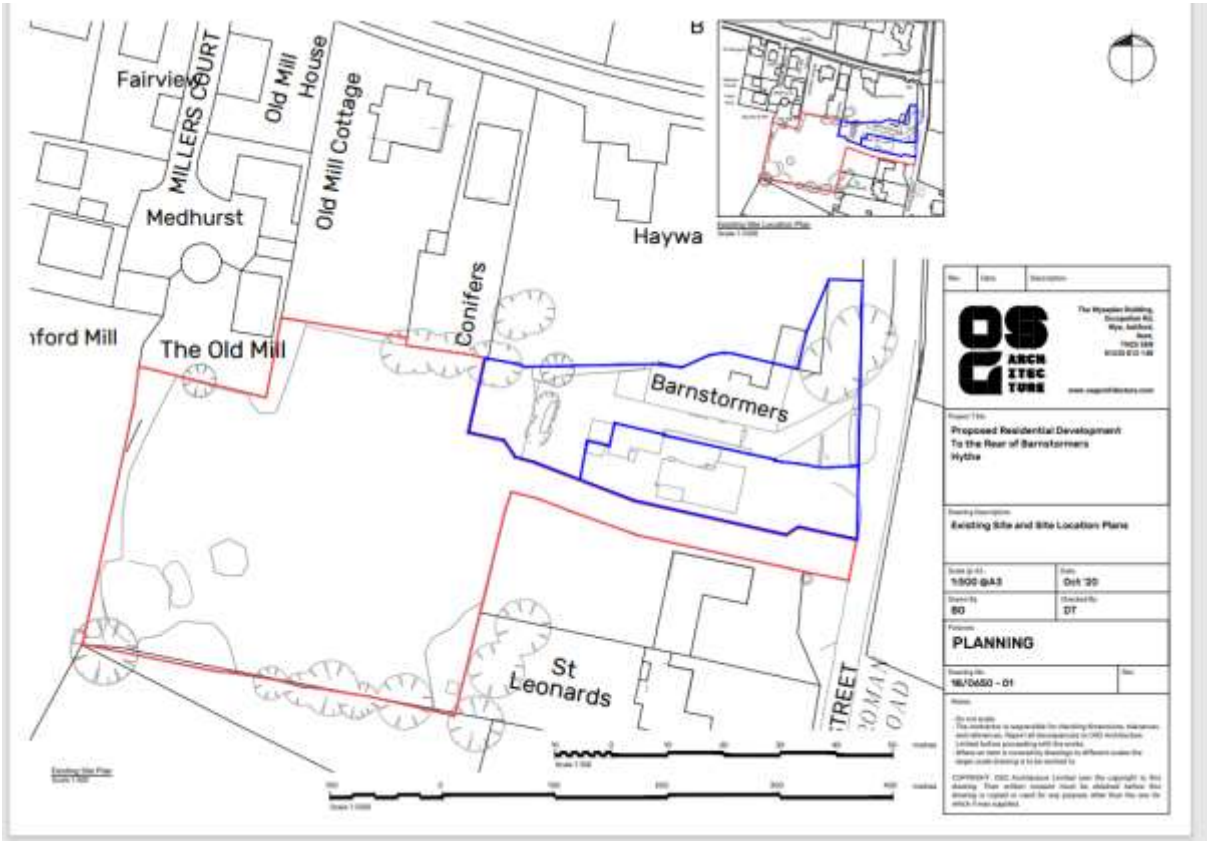
The proposed development has post-2025 mitigation requirement of 0.23kg TP/yr and 13.63kg TN/yr. Following 2030 upgrades to the wastewater treatment works, the mitigation requirement will reduce to 0.11kg TP/yr and 4.55kg TN/yr.

Based on the client's discussions with the Local Planning Authority's planning case officer, we are aware that the local authority is in the process of developing a district-wide solution with Natural England for nutrient credits. The development will seek to achieve nutrient neutrality through the purchasing of credits; initially requiring a higher proportion of temporary/'bridging' credits until the 2030 upgrades to the wastewater treatment works, after which there will be a requirement for 0.11 Permanent Phosphorus (TP) credits and 4.55 Permanent Nitrogen (TN) credits.

5 Conclusion

The nutrient budget for the proposed development of four dwellings at Stanford, Kent has been calculated. The development will require a post-2025 mitigation of 0.23kg TP/yr and 13.63kg TN/yr. Following 2030 upgrades to the wastewater treatment works, the mitigation requirement will reduce to 0.11kg TP/yr and 4.55kg TN/yr. It is proposed to provide sufficient mitigation through the purchase of nutrient credits through the LPA, once available, Therefore it is concluded that the proposed development will not prevent the Conservation Objectives for Stodmarsh SAC from being achieved.

APPENDIX 401/NNAMS/A1 – Site Plans



APPENDIX 401/NNAMS/A2 – Nutrient Calculations

Water infrastructure information		
Description of required information	**Data entry column - user inputs required**	**Additional data entry column - user inputs may be required**
Date of first occupancy (dd/mm/yyyy):		
Average occupancy rate (people/dwelling or people/unit):	2.40	
Water usage (litres/person/day):	120	
Development proposal (dwellings/units):	4	
Wastewater treatment works:	Sellindge WwTW	
Current wastewater treatment works P permit (mg TP/litre):	1.00	
Current wastewater treatment works N permit (mg TN/litre):	27.00	
Post 2025 WwTW P permit (mg TP/litre):	0.5	
Not applicable	Not applicable	
Post 2030 WwTW P permit (mg TP/litre):	0.25	
Post 2030 WwTW N permit (mg TN/litre):	10	

Final calculation of nutrient load from wastewater	
Description of values generated	**Values generated**
Post-2030 wastewater nutrient loading	
Additional population (people):	9.60
Wastewater by development (litres/day):	1152.00
Annual wastewater TP load (kg TP/yr):	0.09
Annual wastewater TN load (kg TN/yr):	3.79
Pre-2030 wastewater nutrient loading	
Annual wastewater TP load (kg TP/yr):	0.19
Annual wastewater TN load (kg TN/yr):	11.36
Pre-2025 wastewater nutrient loading	
Annual wastewater TP load (kg TP/yr):	0.38
Annual wastewater TN load (kg TN/yr):	11.36

Current land use information	
Description of required information	**Data entry column - user inputs required**
Operational catchment:	Upper Stour
Soil drainage type:	Freely draining
Annual average rainfall (mm):	750.1 - 800
Within nitrate vulnerable zone (NVZ):	Yes

Current land uses			
Existing land use type(s) - user inputs required	**Area (ha) - user inputs required**	**Annual phosphorus nutrient export (kg TP/yr)**	**Annual nitrogen nutrient export (kg TN/yr)**
Residential urban land	0.40	0.62	5.78

Future land uses			
New land use type(s) - user inputs required	**Area (ha) - user inputs required**	**Annual phosphorus nutrient export (kg TP/yr)**	**Annual nitrogen nutrient export (kg TN/yr)**
Residential urban land	0.40	0.62	5.78

Total nutrient budget calculations	
Description of values generated	**Values generated**
Wastewater TP load (kg TP/year):	**0.09**
Net land use TP change (kg TP/year):	**0.00**
P budget (kg TP/year):	**0.09**
P budget + 20% buffer (kg TP/year):	**0.11**
Wastewater TN load (kg TN/year):	**3.79**
Net land use TN change (kg TN/year):	**0.00**
TN budget:	**3.79**
TN budget + 20% buffer:	**4.55**
Post-2030 annual nutrient budget	
The total annual phosphorus load to mitigate is (kg TP/yr):	**0.11**
The total annual nitrogen load to mitigate is (kg TN/yr):	**4.55**
Pre-2030 nutrient budget	
The total annual phosphorus load to mitigate is (kg TP/yr):	**0.23**
The total annual nitrogen load to mitigate is (kg TN/yr):	**13.63**
Pre-2025 nutrient budget	
The total annual phosphorus load to mitigate is (kg TP/yr):	**0.46**
The total annual nitrogen load to mitigate is (kg TN/yr):	**13.63**