

Application Description: P/19/1193/OA – Land East of Posbrook Lane, Titchfield

This document provides an update to the nitrogen budget for land east of Posbrook Lane, Titchfield to take into account the latest nitrate methodology (version 4) published by Natural England in March 2020. Natural England advises that a nitrogen budget is provided and that development either avoids harm to European protected sites or provides the level of mitigation required to ensure that there is no adverse effect. Natural England’s methodology for identifying a site’s total nitrogen load is published within, ‘Advice on Achieving Nutrient Neutrality for New Development in the Solent Region’¹ and is relied upon in calculating the site’s nitrogen budget

Stage 1: Calculate Total Nitrogen (TN) in kilograms per annum derived from the development that would exit the Wastewater Treatment Works (WwTW) after treatment

Calculating the additional population generated by the development: As per Natural England’s advice and as defined in paragraph 4.18, an occupancy rate per dwelling of 2.4 has been used.

Determining the water use of the scheme: Water usage is based on a “maximum predicted internal mains water consumption of 110 litres/ person/ day” as per paragraph 4.25 of advice (Natural England, 2020).

Confirming which waste water treatment works (WwTW) the development will use and identify the permit concentration limit for Total Nitrogen: The proposed development will discharge into the Peel Common WWTW, which has a permit limit for total nitrogen of 9mg/l. A worst-case scenario of the WWTW operating at 90% of its permitted limit has been applied.

Calculating the total nitrogen (TN) in kg per annum leaving the WWTW after treatment: The following table sets out the calculation;

Stage 1: Calculating the waste water total nitrogen load from the proposed development	
a) net number of new houses	57
b) Average population per dwelling	2.4
c) Additional population arising from the development (a x b)	136.8

¹ Advice on Achieving Nutrient Neutrality for New Development in the Solent Region, Version 4 -March 2020 (Natural England)

d) Maximum water use per day (litres / person / day)	110
e) Permit limit for Total Nitrogen at Peel Common (mg/l)	9
f) 90% of consent limit (mg/l TN) where there is a permit limit	8.1
g) Deduct acceptable TN loading (@ 2mg/l TN) (as defined in paragraph 4.40 of the advice)	6.1
h) Wastewater generated by the proposed development (c x d) (litres/day)	15,048
i) Total nitrogen discharged after treatment at sewage works (g x h) (mg/TN/ day)	91,792.8
Stage 1: Nitrogen load from waste water (i/1,000,000 x 365) (kg/TN/year)	33.5

Stage 2: Adjust Nitrogen load to offset existing nitrogen from current land use

The nitrogen loss from the current land use will be removed and replaced by that from the proposed development land use. The net change in land use will need to be subtracted from or added to the wastewater Total Nitrogen load (Natural England, 2020).

Identify the total area of land that will be lost due to development: The proposed development site extends to 12.53 ha (Site Location Plan No.16.092.01).

Identify the farm type and the associated nitrate loss: The current farm land use type and related average nitrate-nitrogen loss has been taken from the Farmscoper Model (ADAS 2015). The site is currently comprises grazing land. Paragraph 4.50 of the advice sets out that for sites that are currently in use as horse paddocks, it is recommended that the lowland grazing figure should be used in the calculation.

Stage 2: Adjust Nitrogen load to offset existing nitrogen from current land use	
j) Total area of land to be lost due to development (ha)	12.53
k) Of which total area of agricultural land to be lost due to the development (ha)	12.53
l) Nitrate loss for farm type (kg/ha/yr)	13.0
m) Nitrogen load for agricultural land use (k x l)	162.89

(kg/yr)	
n) Total area of residential curtilage to be lost due to development (ha)	n/a
o) Nitrate loss for urban land (kg/ha/yr)	n/a
p) Nitrogen load for urban land use (n x o) (kg/yr)	n/a
Stage 2: Total nitrogen load current land use (m + p) (kg/yr)	162.89

Stage 3 – Adjust the Total Nitrogen load to account of the land uses within the proposed development: The area of land which will convert to urban land use following development extends to 3.48ha, land that will form open space / SANG, 9.05ha (Site Plan No.16.092.02).

Stage 3: Calculation of the nitrogen load from new development not received by WWTW	
a) Area of land occupied by new 'urban development' (ha)	3.48
r) Total nitrogen load from new urban development at a rate of 14.3kg/ha/yr	49.76
s) Area of open space (ha)	9.05
t) Total nitrogen load from new open space of 0.5ha or above at a rate of 5kg/ha/yr	45.25
Stage 3: total nitrogen load future land use (r + t) (kg/yr)	95.01

Stage 4 – calculate the net change in the Total Nitrogen load that would result from the development

Derived by calculating the difference between the Total Nitrogen load for the proposed development and that for the existing land use, Natural England recommends that a 20% precautionary buffer is also built in.

Stage 4: Calculate the total nitrogen load offset	
Step 1	33.5

Identify Nitrogen load from waste water (Stage 1) (kg/TN/year)	
Step 2 Calculate the new change in Nitrogen from land use change (Stage 3 – Stage 2) (Kg/N/Yr)	-67.88
Step 3 Determine Nitrogen Budget: Total Nitrogen wastewater load for development plus Nitrogen load from land use change (Step 1 + Step 2) (Kg/N/Yr)	-34.37
Step 4 Identify Nitrogen buffer (Step 3/5) (Kg/N/Yr)	-6.87
Step 5 Identify Nitrogen Budget with 20% buffer (Step 3 + Step 4) (Kg/N/Yr)	-41.25

The development would result in a deficit of nitrogen at -41.25 Kg/Yr. The proposals will not result in any adverse effects on the integrity of the Solent Coastal Special Protection Areas resulting from increased discharge of wastewater and will achieve better than 'nitrogen neutrality'.