



Land off Larchwood Avenue, (Former Stantons Yard), Larchwood Avenue, Havant

Nitrogen Budget for a proposed 81 bed, four-storey hotel (Class C1), associated car-parking, landscaping and ancillary works (App Ref. APP/18/01226)

Tiger Developments Limited

13 May 2019

ADAS GENERAL NOTES

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1 INTRODUCTION

ADAS have been commissioned by Tiger Developments Ltd to produce a nitrogen (N) budget for an 81 bed, four-storey hotel (Class C1), associated car-parking, landscaping and ancillary works (App Ref. APP/18/01226), proposed on Land off Larchwood Avenue, Larchwood Avenue, Havant.

2 METHODOLOGY

This nitrogen budget methodology is based on a Natural England document entitled '*Methodology to calculate the nitrogen budget for development in the Solent and achieve nitrogen neutrality*' (Working Draft August 2018).

The methodology incorporates a 4 step approach as follows:

- Step 1 – Calculate additional population;
- Step 2 – Confirm water use;
- Step 3 – Confirm Waste Water Treatment Works (WWTW) and permit level; and
- Step 4 – Calculate total nitrogen (TN) in kg per annum that would exit the WTW after treatment.

Assumptions for each of the calculations are presented in the following Results section (Section 3).

3 RESULTS

3.1 Introduction

This section details the assessment based on steps 1-4 previously described.

3.2 Step One - calculate additional population

The additional population is calculated to be approximately **103.275 persons**, based on the following assumptions:

- The proposal has 81 bedrooms;
- The average room occupancy is 75%; and
- The average occupancy rate per room is 1.7 persons/room.

3.3 Step Two - confirm the water use

The water use is estimated at **11360.25 L/day** based on the following assumptions:

- The water use was estimated at 110 L/person/day;
- The above figure is based on a typical residential usage as an assumed equivalent;
- There are no high demand items (e.g. a swimming pool); and
- The proposed café bar is considered within the typical residential use.

3.4 Step Three - confirm the WTW and permit level

A level of **9.7 mg TN/L** is proposed as the permitted discharge level, based on the following assumptions:

- There is an available foul sewer connection for the proposed development;
- Although unconfirmed, Budds Farm WTW is a 2km distance from the proposed development site and is the most likely destination for the foul water;
- Budds Farm WTW treats the wastewater from homes across Portsmouth, Havant, Hayling Island, Cosham, Paulsgrove, Waterloooville, Horndean and Hambledon. It serves nearly 410,000 people and during normal weather conditions treats almost 109 million L of wastewater/day; and
- Southern Water confirms that the total N discharge permit for Budds Farm WTW is 9.7 mg TN/L as an annual average.

3.5 Step Four - calculate total nitrogen

An estimated **40.22 kg** of total N is calculated as the annual total N contribution from the proposed development.

A summary of the full results is shown in Table 1.1.

Table 3.1: Summary of the total N calculation

Steps	Item	Value	Units	Assumptions
	Proposed development	81	Rooms per hotel	
1	Additional Persons	103.275	Person per day	75% occupancy with 1.7 persons per room
2	Water Use	11,360.25	L/day	110L per person per day
3	Permit Level (Budds Farm WTW)	9.7	mg TN/L	Discharge consent limit
4	Total N discharge from WTW derived from development	110,194.4	mg TN/day	
4	Total N discharge from WTW derived from development	0.11	kg TN/day	
4	Annual Total N contribution from development	40.22	kg TN/year	365 days per year

4 NITROGEN CONTRIBUTION IN CONTEXT

The total N contribution is very small in the wider context. For example, as part of a mixed sward white clover can fix around 180kg of atmospheric nitrogen per hectare per year. The potential contribution from the development could therefore be seen to be the equivalent N fixation of 0.22 hectare of clover / grass sward.

In terms of mitigation, since there is no change in agricultural land use at the site, this cannot be set against the overall nitrogen budget. As an offset, an equivalent mitigation measure would be the conversion of 2.21 hectares of cereal cropped area to suitable alternative natural greenspace (SANG). Alternatively, 40.22 kg of nitrogen could be mitigated by changing the discharge consent from Budds Farm WTW from 9.7 mg TN/L to 9.698989 mg TN/L, an approximate decrease of 1 µg TN/L.

Given the small area of the site and the footprint of the development, an on-site, alternative technology to remove the nitrogen (such as a reed bed) would also appear to be unfeasible. The reality of achieving mitigation through land conversation or WTW abatement would also appear cumbersome for the relatively small amounts involved.

In this context, the nitrogen Impact for the site can be seen as de minimis.

REFERENCES

NATURAL ENGLAND (2018). *Methodology to calculate the nitrogen budget for development in the Solent and achieve nitrogen neutrality*. Working Draft August 2018.