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|------------------------|-------------------------------------------------------------------------------------|
| <b>Site:</b>           | Land North of Oysters, Hayling Island                                               |
| <b>Client:</b>         | Gillenden Developments                                                              |
| <b>Job Number:</b>     | 784-B028488                                                                         |
| <b>Report Type(s):</b> | Nitrogen Balancing Assessment                                                       |
| <b>File Location:</b>  | M:\Projects\784-B028488 Land North of Oysters\60 Project Output\61 Work in Progress |

## INTRODUCTION

Tetra Tech was appointed by Gillenden Developments to calculate the change in nutrient outputs from existing to future use associated with the proposed development at Land North of Oysters, Hayling Island centred on OS grid reference SZ 71102 99872.

The calculations are required in response to recent consultation with Natural England on residential projects in the vicinity of the Solent following the findings of the Integrated Water Management Study for South Hampshire, published by the Partnership for Urban South Hampshire<sup>1</sup>. Due to the uncertainty over whether new development can be accommodated by existing wastewater treatment infrastructure without causing harm to coastal European sites, Natural England advise that all residential development should achieve nitrogen neutrality.

The purpose of this assessment is to provide guidance at an early stage relating to the likely impacts of the proposed scheme relating to TN and the potential requirement for mitigation.

This report has been prepared by Consultant Ecologist Emma Taylor and the conditions pertinent to it are provided in Appendix A.

## METHODOLOGY

To make the assessment, Version 5 of Natural England's *Advice on Achieving Nutrient Neutrality for New Development in the Solent Region*<sup>2</sup> for calculating nitrogen budgets was used.

## ASSUMPTIONS

The assumptions relevant to this project in addition to those included in the Natural England methodology are provided in Table 1.

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<sup>1</sup> PUSH, (2018), Integrated Water Management Study, [online] Available at <https://www.push.gov.uk/wp-content/uploads/2018/07/IWMS-Appendix-1.pdf>, Accessed February 2021 .

<sup>2</sup> Natural England, (2020), ADVICE ON ACHIEVING NUTRIENT NEUTRALITY FOR NEW DEVELOPMENT IN THE SOLENT REGION, Version 5 – June 2020, [online] Available at <https://www.push.gov.uk/wp-content/uploads/2020/06/Natural-England%E2%80%99s-latest-guidance-on-achieving-nutrient-neutrality-for-new-housing-development-June-2020.pdf>, Accessed February 2021.

**Table 1: Project Assumptions**

|                                                                                                 |                         |
|-------------------------------------------------------------------------------------------------|-------------------------|
| <b>Number of proposed units:</b>                                                                | 32 dwellings            |
| <b>The total site area:</b>                                                                     | 1.24                    |
| <b>The current land uses are:</b>                                                               | 1.24 cereal crops       |
| <b>The future land uses will be:</b>                                                            | 1.24 urban <sup>1</sup> |
| <b>The waste water from the site will be treated at this wastewater treatment works (WwTW):</b> | Budds Farm              |
| <b>The consent limit for the WwWT is:</b>                                                       | 9.7 mg/l TN             |

1. Although areas of public open space are included in line with policy requirements, they fall below the 0.5ha threshold in the Natural England guidance to be assessed separately from the urban areas.

## RESULTS

The results using the method for determining the nitrogen budget for the proposals are provided in Table 2. The full workings are shown in Appendix B.

**Table 2: Summary of the results**

| <b>Calculating Total Nitrogen (TN) Load From Development Wastewater</b> | <b>Calculating TN Load From Current Land Use</b> | <b>Calculating TN Load From Future Land Uses</b> | <b>Calculating Net Change in TN From the Development</b> | <b>Apply 20% Buffer</b> |
|-------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------------|----------------------------------------------------------|-------------------------|
| 20.752 Kg/TN/yr                                                         | 38.688 Kg/TN/yr                                  | 17.732 Kg/TN/yr                                  | -0.204 Kg/TN/yr                                          | n/a                     |

The calculations show that the development would result in a negative TN budget of -0.204 Kg/TN/yr.

It is therefore considered that the development proposals would have no potential to result in an adverse effect on the integrity of the Solent European sites.

## SUMMARY

The proposed development is for up to 32 dwellings on 1.24ha of cereal crop land. This will result in a net reduction of -0.204kg/TN/yr and no potential for an adverse effect on the integrity of the Solent European sites.

| Document Control                   |                                 |                |                                   |
|------------------------------------|---------------------------------|----------------|-----------------------------------|
| <b>Revision:</b>                   | <b>A</b>                        | <b>Status:</b> | <b>Final</b>                      |
| <b>Date:</b>                       | 16 <sup>th</sup> August 2021    |                |                                   |
| <b>Prepared by:</b><br>Emma Taylor | <b>Checked by</b><br>David West |                | <b>Approved By:</b><br>David West |

## APPENDIX A: REPORT CONDITIONS

This Report has been prepared using reasonable skill and care for the sole benefit of [Gillenden Developments] ("the Client") for the proposed uses stated in the report by [Tetra Tech Environment Planning Transport Limited] ("Tetra Tech"). Tetra Tech exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

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The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. Tetra Tech accept no liability for issues with performance arising from such factors.

## APPENDIX B: NUTRIENT BALANCING CALCULATIONS

**Table 3: Calculating Total Nitrogen (TN) Load From Development Wastewater (Stage 1)**

| Step                                                  | Measurement                                                                        | Value     | Unit        | Explanation                  |
|-------------------------------------------------------|------------------------------------------------------------------------------------|-----------|-------------|------------------------------|
| Development proposal                                  | Development types that would increase the population served by a wastewater system | 32.000    | No. of beds | Development is 32 dwellings. |
| 1                                                     | Additional population                                                              | 76.800    | Persons     | 2.4 persons per dwelling.    |
| 2                                                     | Wastewater volume generated by development                                         | 8448.000  | L/day       | Persons x 110 litres/day.    |
| 3                                                     | Receiving WwTW environmental TN permit limit.                                      | 9.700     | mg/l TN     | Budds Farm TN limit          |
| 4                                                     | Deduct acceptable TN loading (@ 2 mg/l TN) (as defined in Paragraph 4.40)          | 6.730     | mg/l TN     | 90% of Step 3 - 2mg/l TN     |
| 5                                                     | TN discharged after WwTW                                                           | 56855.040 | mg/TN/day   | Step 2 x Step 4              |
| 6                                                     | Convert mg/TN to Kg/TN per day                                                     | 0.057     | Kg/TN/day   | Step 5 divided by 1,000,000  |
| 7                                                     | Convert Kg/TN per day to Kg/TN per year                                            | 20.752    | Kg/TN/yr    | Step 6 x 365 days            |
| <b>Total TN load from wastewater: 20.752 Kg/TN/yr</b> |                                                                                    |           |             |                              |

**Table 4: Calculating TN Load From Current Land use (Stage 2)**

| Step                                                                | Measurement                            | Land use     | Value | Unit     | Explanation                      |
|---------------------------------------------------------------------|----------------------------------------|--------------|-------|----------|----------------------------------|
| 1                                                                   | Area of existing Land Use              | Cereal crops | 1.24  | ha       | Area of land lost to development |
| 2                                                                   | TN leachate value for Land Use         | Cereal crops | 31.20 | Kg/ha/yr | -                                |
| 3                                                                   | TN leachate value for area of Land use | Cereal crops | 38.69 | Kg/TN/yr | Step 1 x Step 2                  |
| <b>Total TN Leachate value for current land use: 38.69 Kg/TN/yr</b> |                                        |              |       |          |                                  |

**Table 5: Calculating TN Load From Future Land Uses (Stage 3)**

| Step                                                                | Measurement                                       | Value  | Unit     | Explanation                                            |
|---------------------------------------------------------------------|---------------------------------------------------|--------|----------|--------------------------------------------------------|
| 1                                                                   | New urban land use area                           | 1.240  | ha       | Area of development that will change to urban land use |
| 2                                                                   | TN leachate value from new urban area             | 17.732 | Kg/TN/yr | Step 1 x 14.3 Kg/TN/yr                                 |
| 3                                                                   | New / retained woodland, PoS or SANG              | 0.000  | ha       | Area of development that will be woodland, PoS or SANG |
| 4                                                                   | TN leachate value from woodland / Pos / SANG area | 0.000  | Kg/TN/yr | Step 3 x 5 Kg/TN/yr                                    |
| 5                                                                   | Combined TN leachate values from future land uses | 17.732 | Kg/TN/yr | Step 2 + Step 4                                        |
| <b>Total TN Leachate value for future land use: 17.732 Kg/TN/yr</b> |                                                   |        |          |                                                        |

**Table 6: Calculating TN Budget for the Development Proposals (Stage 4)**

| Step                                   | Measurement                                                          | Value  | Unit     | Explanation       |
|----------------------------------------|----------------------------------------------------------------------|--------|----------|-------------------|
| 1                                      | Identify TN loads from wastewater                                    | 20.752 | Kg/TN/yr | Stage 1           |
| 2                                      | Calculate the net change in TN leachate value due to land use change | 20.956 | Kg/TN/yr | Stage 3 – Stage 2 |
| 3                                      | Determine nitrogen budget                                            | -0.204 | Kg/TN/yr | Step 1 – Step 2   |
| 4                                      | Where TN budget is positive add 20% precautionary buffer             | n/a    | Kg/TN/yr | Step 3 + 20%      |
| <b>Total TN Budget -0.204 Kg/TN/yr</b> |                                                                      |        |          |                   |

## APPENDIX C: SITE LAYOUT PLAN



0 50  
metres  
(1:1,250)

Site boundary 1.24ha (3.06acres)

Project  
Land North of the Oysters

Drawing Title  
Illustrative Masterplan

|                    |                        |                |                   |
|--------------------|------------------------|----------------|-------------------|
| Date<br>20/07/2021 | Scale<br>1:1,250 at A3 | Drawn by<br>CT | Check by<br>SR/ML |
| Project No<br>1239 | Drawing No<br>003      | Revision<br>E  |                   |

Mosaic