



Consulting Civil Engineers

## Water Neutrality Report

**The Green Man, Church Road, Partridge Green, West Sussex RH13 8JT**

**For**

**Mr Nick Iles**

Rev - P

Reference **C2497**

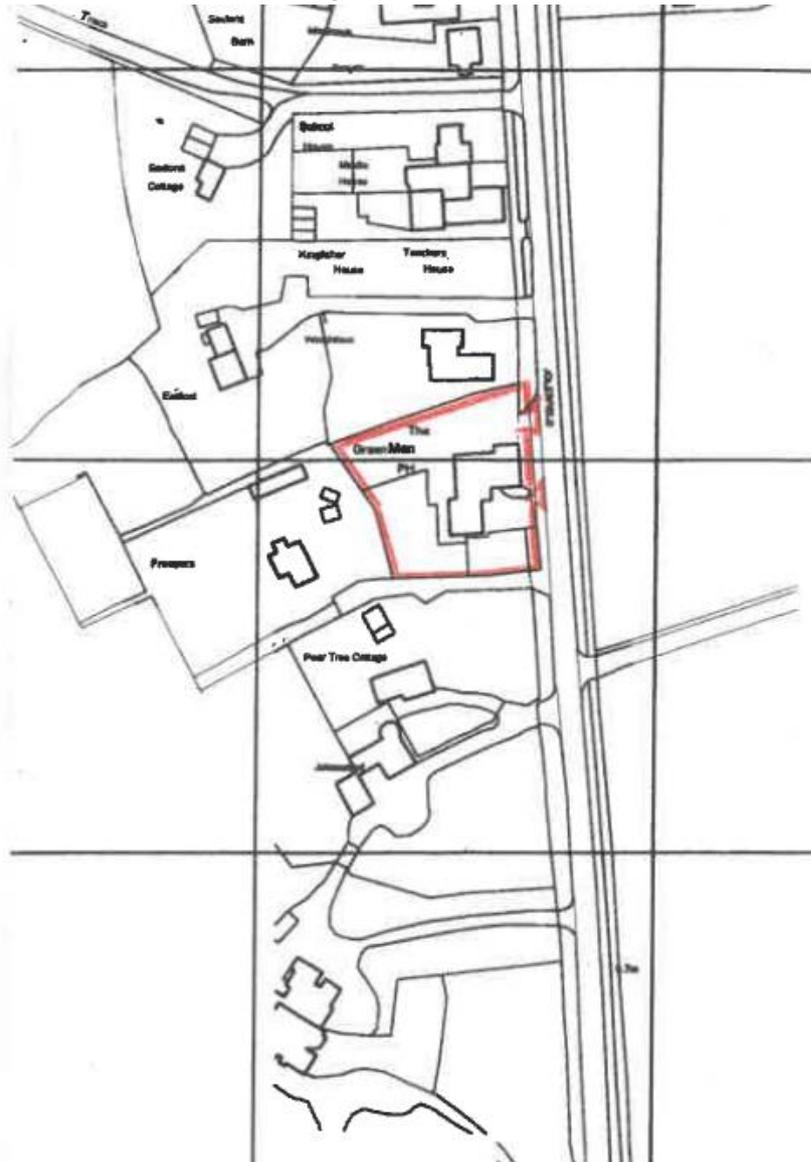
Date **2<sup>nd</sup> February 2023**

Revision	Date of Issue	Comments	Prepared By	Checked By
P	02.02.23	Initial Issue	LH	CS

# 1 Introduction

- 1.1.1 CGS Civils Ltd has been appointed by Mr Nick Iles to undertake a Water Neutrality Report for a proposed development at The Green Man in Church Road, Partridge Green, West Sussex. Planning permission is sought for the conversion of an existing public house to a single 1-bedroom dwelling and 2 No. 2-bedroom dwellings.
- 1.1.2 The purpose of this report is to therefore provide an overview on the potential water usage changes on the site as a result of the proposed development, and to confirm that the site is water neutral.
- 1.1.3 The proposed development is located at OS Grid Reference TQ 18763 19795 and has the post code RH13 8JT.

Fig 1. Site Location



- 1.1.4 Waterwise defined Water Neutrality as:

*'For every new development, total water use in the region after the development must be equal to or less than the total water uses in the region before the new development.'*

1.1.5 Achieving water neutrality involves using a three-step approach. First, the demand for water from the new development must be reduced as far as is practicable, followed by the re-use of water; then the remaining demand should be offset within the region. Following this three-step approach allows the volume that requires offsetting to be reduced which ultimately reduces the cost of the overall scheme. This is noted within the Waterwise neutrality definition, which defines the three steps which should be undertaken in order to achieve water neutrality in their recent review dated January 2021.

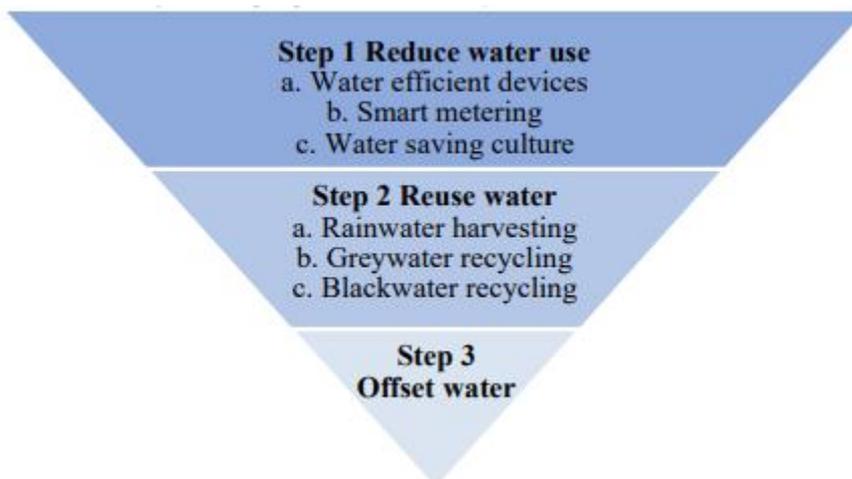
- Reduce water demand in the new development through improvement in efficiency.
- Re-use water, wherever possible.
- Offset the remaining water demand from the new development if required.

1.1.6 The report will be split into the following sections:

- A Review of Water Neutrality demand reduction
- A calculation of estimate water usage from proposed development
- Identification of measures that can be first used to reduce this demand
- Identification of measures that can be used to re-use water
- Establish solutions to offset that demand in order to achieve neutrality

1.1.7 This report will follow the methods documented within ‘A Review of Water Neutrality in the UK’ carried out by Waterwise in January 2021. The document provides details on how developments can achieve water neutrality by utilising the 3-stage approach.

**Fig 2. 3-stage approach**



1.1.8 Some increase in water demand within the region from planned development during the local plan period is inevitable. However, it can be minimised by making the site as water efficient as possible.

1.1.9 Per Capita Consumption (PCC) is used as a measure of water use and is the volume of water that is used by one person in one day. It is usually measured in litres per person per day (l/p/d). The average PCC within Southern Water’s ‘Sussex North Water Resource Zones (WRZ)’ is 135 l/p/d. Homes without a water meter consume on average 160 l/p/d and for homes with a water meter, consume on average 131 l/p/d.

1.1.10 Part G of the Building regulations currently states that new build housing should achieve a minimum of 125 l/p/d. A tighter target of 110 l/p/d can be requested if the local authority can establish a clear need based on available evidence.

1.1.11 The table below indicates different demand scenarios including Southern Water’s Target 100 Ambition to achieve 100 l/p/d, as well as further scenarios where water demand is cut more dramatically.

Table 1 PCC Demand Scenarios

Demand Scenario	Per Capita Consumption (l/p/d)
British Flows and Loads	150
Building Regulations Standard	125
Building Regulations Optional	110
Target 100	100
Realistic Achievable	85
Ambitious	62

1.1.12 The benefits of water neutrality are wide ranging, from financial and reputational to environment and social. For a new domestic building, they could include:

- **Saving Water** – Over 100,000 litres of water can be saved per year for each water neutral home built
- **Saving Carbon** – A significant CO2 saving can be achieved by reducing the demand for hot water for baths, showers, basins, dishwashers and washing machines
- **Saving Money** – Both water and energy bills will reduce
- **Reducing environmental impact** – Decreasing water abstracted from rivers and groundwater sources
- **Improved Resilience** – For the future by minimising the additional pressure on water resources
- **Enabling future housing growth** – In water scarce areas by reducing the impact of new homes and buildings
- **Reducing discharge to sewage** – by using less water, collecting rainwater and recycling greywater, less water is discharged to the drainage network
- **Short pay-back time** – After approximately 5 years the saving of water neutrality will outweigh the costs of doing so.

## 2 Calculation of estimate water usage from the proposed development

2.1.1 Before any necessary steps to achieve water neutrality can be determined, the total water demand for the proposed development must first be calculated. The proposed scheme will consist of the conversion of an existing public house to form a single 1-bedroom and 2 No. 2-bedroom dwellings. In accordance with the average occupancy levels set out by Horsham DC, the population for the development will be 1.32 for the single bedroom dwelling and 1.89 for each 2-bedroom dwellings for a total population of 4.53.

Table 2 Average occupancy levels

Number of bedrooms	Average occupancy level
1	1.32
2	1.89
3	2.47
4	2.86
5	3.09

2.1.2 As the proposed property will be a new dwelling, Policy 37 of the Horsham District Planning Framework (HDPF) triggers the requirement for the optional building regulations standard of 110 litres per person per day (l/p/d), therefore:

$$4.53 \times 110 \text{ l/p/d} \\ = 498.3 \text{ l/day}$$

### 3 Step 1 – Proving site is water neutral

3.1.1 Due to the change in use from a Public House to a single 1-bedroom and 2 No. 2-bedroom dwellings, the site by virtue of this change becomes water neutral due to the reduction in water usage on a daily basis. There is also no requirement for specifying water efficient fittings or installing a rainwater harvesting system. The client has provided water bills dating from 18<sup>th</sup> December 2017 until 5<sup>th</sup> June 2022 which covers a period of 1,630 days.

**Table 3 Summary of Water Bills**

Date	Previous Reading	Current Reading	Usage (m <sup>3</sup> )	Usage (l)
18 Dec 17 – 12 March 18	3830	4024	194	194,000
12 March 18 – 18 June 18	4024	4269	245	245,000
18 June 18 – 10 Sep 18	4269	4478	209	290,000
10 Sep 18 – 1 Oct 18	4478	4472	-6	-6,000
1 Oct 18 – 10 Dec 18	4472	4636	164	164,000
10 Dec 18 – 4 Mar 19	4636	4841	205	205,000
5 Mar 19 – 17 June 19	4841	5086	245	245,000
17 June 19 – 1 Oct 19	5086	5353	267	267,000
1 Oct 19 – 15 Dec 19	5353	5536	183	183,000
16 Dec 19 – 11 March 20	5536	5820	284	284,000
11 March 20 – 15 Mar 20	5820	5837	17	17,000
15 Mar 20 – 4 July 20	Missing	Missing	N/A	N/A
4 July 20 – 10 Sep 20	5837	6097	260	260,000
10 Sep 20 – 16 Dec 20	6097	6366	269	269,000
16 Dec 20 – 19 Mar 21	6366	6440	74	74,000
19 Mar 21 – 4 June 21	6440	6620	180	180,000
4 June 21 – 19 Sep 21	6620	6828	208	208,000
20 Sep 21 – 5 Dec 21	6828	6978	150	150,000
6 Dec 21 – 2 March 22	6978	7203	225	225,000
3 March 22 – 5 June 22	7203	7411	208	208,000
<b>TOTAL</b>			<b>3581</b>	<b>3,581,000</b>

3.1.2 The above water bills listed in Table 3 prove that there is a usage of 3,581m<sup>3</sup> of water over a period of 1,630 days which equates to **2,196.9 l/day**. Therefore, by converting the public house to the proposed dwellings, there is a total saving of **1,698.6 l/day** which results in the proposed site being water neutral.

### 4 Conclusion

4.1.1 To summarise:

- The proposed development will use on average **498.3 l/day**.
- The existing Public House uses on average **2,196.9 l/day**, therefore, the proposed conversion to the 3 dwellings will result in a total water saving of **1,698.6 l/day** which results in the site being water neutral.