# Water Neutrality Statement for High Beech - Application DC/24/0568

## Introduction and Background

This statement concerns the current and expected mains water consumption of the property at High Beech, Mill Lane, Lower Beeding, RH13 6PX.

A planning application was submitted to Horsham District Council, 12th April 2024, for the demolition and erection of a new residential dwelling and the erection of an office / leisure room. On 5th June 2024, the Planning Officer advised that Natural England had been consulted as part of the process for determining this application. Natural England responded on 7th June requesting that a Water Neutrality statement was required to 'evidence the existing and proposed water usage'.

Accordingly, this statement has been prepared by the homeowner in June 2024, by referring to current water consumption measured by the supplier Southern Water, Natural England's guidance document Arun Valley and Water Neutrality - Frequently asked questions, The Building Regulations 2010 Section G (2016 revisions), and British Standard BS8515:2009 (Rainwater Harvesting).

It sets out the ways in which we plan to achieve a *reduction* in the amount of wholesome water consumed by the site compared to its current measured usage, thereby providing a minor benefit to the Arun Valley region.

Although not directly relating to water abstraction, the proposed development also plans to remove much of the impermeable hard standing which currently exists which, while not affecting consumption, currently exacerbates water run-off instead of replenishing ground water.

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## Overview of approach

To decrease water abstraction from the Arun Valley, the following are proposed:

1. Rainwater Harvesting – A proposed 4000L rainwater harvesting tank onsite is proposed for garden watering / non-potable uses (such as WC flushing).
2. The development will utilise a combination of 3/6 litre low flush toilets, aerated taps and shower heads to reduce water consumption.
3. More water-efficient white goods in line with current best practises.
4. More efficient plumbing and reduced leaks.

The approaches outlined above are detailed further below.

# Caveats and assumptions

It is important to note that assumptions have been made about proposed manufacturers and appliance selection based on the best available information available.
As this statement has been written during the local authority's planning consultation period, the plans and construction of the proposed property have not been reviewed by Buildings Control, and may by law be required to change.

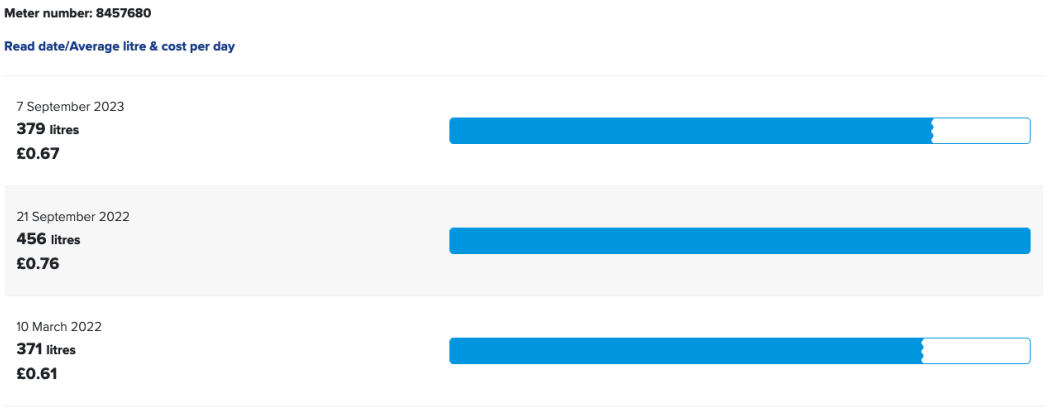
The figures given assume the occupancy of the property will continue to be 3 people. This figure is not expected to increase during our ownership.

The homeowner is not a building or a water industry professional, and although the information has been collected and provided honestly and in good faith, this document may have errors and omissions.

# Current water consumption

## Measured consumption

The figures below are provided by the water supplier Southern Water from the property address measured using meter number 8457680 (Note: this may change as the water meter has been changed by the supplier following a stop-cock failure)




The figures provided by Southern Water have been used to produce the following table:

| Period start | Period end | Days | $m^3$ | Litres | Litres/day |
|---|---|---|---|---|---|
| 28-Sep-2021 | 10-Mar-2022 | 163 | 61 | 61000 | 374.2 |
| 10-Mar-2022 | 21-Sep-2022 | 195 | 89 | 89000 | 456.4 |
| 22-Sep-2022 | 07-Sep-2023 | 350 | 133 | 133000 | 380 |

This gives the current measured water consumption for the entire site as at 7th Sep 2023 of 403 litres/day, which was slightly above the supplier-projected water consumption for the 3 registered occupants of the property of 379 litres per day.

## Known Existing Problems

The existing dwelling is over 50 years old, poorly constructed and designed with no regard for water consumption. Additionally, it has been retrofitted with a early version of an air-source heat pump (ASHP) which supplies central heating and has been badly integrated into the domestic hot water supply. This poor design is embedded in the construction of the building and has led to demonstrable regular water waste, such as:

- The circuitous route for plumbing requires a minimum 120 second wait for warm water at the most frequently-used shower, which at the measured flow rate of >10 litres/minute, means that ~20 litres of otherwise drinkable water is wasted every shower.
- There are multiple examples of very minor water leaks throughout the property, which will contribute to water wastage.

# Proposed development consumption

The proposed property will use high specification and efficiency appliances and fittings, and the projected usage is shown below and broken down later. Where flow rates have not been available from manufacturer's figures, the maximal flow rates per fitment permitted for new developments according to Building Regulations Part G Section 2.6 have been used instead. A minimal offset from rainwater harvesting has been optionally included.

The numbers obtained were then used in Water Research Council's Water Efficiency Calculator, to obtain the following table:

| | |
|---|---|
| Total Calculated use (litres/person/day) =SUM(column 4) | 107.61 |
| Contribution from greywater (litres/person/day) | 0 |
| Contribution from rainwater (litres/person/day) | 4.65 |
| Normalisation factor | 0.91 |
| Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day) | 93.69 |
| External water use | 5.0 |
| Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day) | 98.7 |

# Conclusion

The proposed property is projected to result in a net decrease in consumption of wholesome water (as compared to the current measured consumption) of between 80 and 107 litres per day - a decrease of between 20-27%:

| | **Total per day** | **Per person per day** |
|---|---|---|
| **Current measured total consumption (as of 7 Sep 2023)** | 403 litres | 134.3 litres |
| **Calculated consumption of property as proposed (excluding rainwater harvesting)** | 322.83 litres | 107.61 litres |
| **Calculated internal consumption of property as proposed (including rainwater harvesting for WC flushing) - BR 17.K:** | 296.1 litres | 98.7 litres |

The above table assumes the occupancy of the property remains unchanged at 3 people.

Overall, the proposed property represents an improvement to the water abstraction demand currently imposed by the property on the Arun Valley region.

# Appendix: Figures used in calculating proposed values

## Fittings: Taps, WCs, and appliances proposed

Basin taps proposed are Groehe Eco-Joy type with a maximal flow rate of 5.7 litres per minute

Kitchen/Utility taps have been calculated using the default maximal permissible flow rate in Building Regulations Type G of 8 litres per minute.

WCs proposed are Groehe Dual Flush type with a large and small flush of 6 litres and 3 litres respectively.

Baths proposed are the default 180 litre capacity as specified in Building Regulations Type G

Showers proposed are also the default maximal flow of 10 litres / minute, and the proposed dog wash (strictly for domestic personal use) has been treated as a shower.

### Proposed “wet” appliances

Dishwasher proposed: Meile G 7650 SCVi AutoDos, 14 place settings, 8.4 litres of water consumed per cycle giving 0.6 litres per place setting.

Washing Machine proposed: Miele WWV980 WPS Passion, 9 kg load, 48 litres of water consumed per load giving 5.13 litres of water used per kg of load

## Rainwater harvesting and collection

The figures have been calculated as per BS 8515:2009, using the intermediate method, a proposed surface area of 50m², annual rainfall of 850mm, and a combined filter efficiency and yield coefficient value of 0.8, giving a reduction in WC flushing consumption of 4.65 litres per person per day.

The figures in the table above give the projected consumption both including and excluding any benefit from a rainwater harvesting system.

## Water Research Council full table

| Installation Type | Unit of Measure | Capacity/Flow rate (1) | Use Factor (2) | Fixed use (litres/ person/day) (3) | Litres/person/ day = [(1)x(2)] + (3) (4) |
|---|---|---|---|---|---|
| **WC** (single flush) | Flush Volume (litres) | | 4.42 | 0.00 | 0 |
| **WC** (dual flush) | Full flush Volume (litres) | 4.5 | 1.46 | 0.00 | 6.57 |
| | Part flush Volume (litres) | 3 | 2.96 | 0.00 | 8.88 |
| **WC** (multiple fittings) | Average effective flushing Volume (litres) | | 4.42 | 0.00 | 0 |
| **Taps** (excluding kitchen/utility room taps) | Flow rate (litres/min) | 5.70 | 1.58 | 1.58 | 10.59 |
| **Bath** (where shower also present) | Capacity to overflow(litres) | 180.00 | 0.11 | 0.00 | 19.80 |
| **Shower** (where bath also present) | Flow Rate(litres / minute) | 8.00 | 4.37 | 0.00 | 34.96 |
| **Bath Only** | Capacity to overflow(litres) | | 0.50 | 0.00 | 0 |
| **Shower Only** | Flow Rate (litres/ minute) | | 5.60 | 0.00 | 0 |
| **Kitchen/Utility room sink taps** | Flow rate (litres/ minute) | 8.00 | 0.44 | 10.36 | 13.88 |
| **Washing Machine** | (Litres/kg dry load) | 5.13 | 2.1 | 0.00 | 10.77 |
| **Dishwasher** | (Litres/place setting) | 0.60 | 3.6 | 0.00 | 2.16 |
| **Waste disposal unit** | (Litres/use) | ☐ Present | 3.08 | 0.00 | 0 |
| **Water Softener** | (Litres/person/day) | | 1.00 | 0.00 | 0 |
| | (5) | Total Calculated use (litres/person/day) =SUM(column 4) | | | 107.61 |
| | (6) | Contribution from greywater (litres/person/day) | | | 0 |
| | (7) | Contribution from rainwater (litres/person/day) | | | 4.65 |
| | (8) | Normalisation factor | | | 0.91 |
| | (9) | Total internal water consumption = [(5)-(6)-(7)]x(8) (litres/person/day) | | | 93.69 |
| | (10) | External water use | | | 5.0 |
| | (11) | Total water consumption (Building Regulation 17.K) =(9)+(10)(litres/person/day) | | | 98.7 |

| Installation Type | Make/Model (mandatory) | Litres/ Person/Day |
|---|---|---|
| WC (dual flush) | Groehe Dual Flush | 15.45 |
| Taps | Groehe | 10.59 |
| Baths (shower(s) present) | Unspecified / Default maximum | 19.80 |
| Showers (bath(s) present) | Unspecified / Default maximum | 34.96 |
| Kitchen Taps | Unspecified / Default maximum | 13.88 |
| Washing Machines | Miele WWV980 WPS Passion | 10.77 |
| Dishwasher | Miele G 7650 SCVi AutoDos | 2.16 |
| Contribution from rainwater (litres/person/day) | Make/Model required | 4.65 |